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ANDREW YARRANTON AND THE NAVIGATION WORKS AT ASTLEY

By J. M. Palmer and M. I. Berrill

Some three miles south of Stourport the River Severn is joined on its western bank by a small brook which meanders into the main river through low-lying meadowland. This is Dick Brook which runs down from Astley by a narrow wooded valley and forms the boundary with the neighbouring parish of Shrawley along the last mile of its course.

Dick Brook is of great interest to the canal historian because of the probable association it has with the activities of that remarkable seventeenth century jack-of-all-trades and pioneer of inland navigation, Andrew Yarranton. The authors had come across references in various different sources to the supposed existence of the remains of three pound locks on the Brook which were reputed to have been constructed by Yarranton, and with the object of seeing these and of trying to find out more about their origin they recently spent a weekend in the area. As the accompanying sketch map and the following notes will show, there turned out to be an unusually interesting group of early industrial remains along the Brook, including a part of what is almost certainly Yarranton's blast furnace.

THE 'LOCKS'

There are two chambers on the Brook, both massively constructed of local sandstone blocks. Although they are now in a dilapidated condition it can be seen that they were built for the purpose of

rendering the Brook navigable. The first, or lower, chamber lies in the channel of the Brook approximately thirty yards from its confluence with the River Severn. Holt Lock on the main river, which was constructed only during the last century, holds up the water level above its natural height and this, coupled with the flooded condition of the Severn at the time of our visit, made it only possible to see the top course of the stonework. We know, however, that in 1929 approximately seventy feet of sandstone walling was visible on either side, including recesses in the stonework at the lower end, ten feet long and one foot deep, which could at one time have accommodated a single pair of wooden gates.

The second chamber is situated some three hundred yards inland, quite near the point where the Brook is crossed by a new concrete footbridge. Along the bed of the Brook the distance between the two chambers is probably three times as great owing to its tortuous course. The remains of the second chamber were readily accessible, though less of the stonework now remains. Along the northern bank of the Brook there is again approximately seventy feet of sandstone walling with the gate recess at the lower end of the chamber in almost perfect condition. The opposite or southern wall has almost completely disappeared but sufficient remained at the lower end for us to measure the width of the chamber to be 10 feet 9 inches. The Brook itself was some three feet deep in the chamber at the time but by wading at the upstream end (a method of research not recommended to other members!) we were able to trace what appeared to be a cill crossing the chamber at right angles some fifty-two feet above the upstream end of the gate recesses. There was no stonework remaining visible above water level on either side of the cill and we think it quite probable that this marks the original upstream extent of the masonry. If this is so then it is quite probable that there were never any gates at the upstream end of the chamber. The existence of a straight cill running at right angles across the Brook would mean that there could only have been a single gate and we think that this is most unlikely as there is no trace of any of the heavy masonry which would have been necessary to support it. Some idea can be had of the solid way in which this chamber was constructed from several of the sandstone blocks which measured 2' 9" x 2' 6" x 1' 0". It seems most likely therefore that these 'locks' were not locks in the modern acceptance of the word, i.e. pound locks, but watergates or staunches after the fashion of what can still be seen on the Warwickshire Avon today. This theory is borne out by the observations made by two members of the Worcestershire Archaeological Society in 1929 (see below) on the lower chamber, which has an almost identical length of wall remaining and also by the fact that there would be no necessity to incur the expense of building pound locks on such a short navigation, with the adequate supply of water available. Reference has been made in some quarters to the existence of a third lock and a length of canal, but these have proved to be the foundations and retaining wall of a substantial water mill and an artificial leat three furlongs in length supplying the water. This building is known to have been a forge and almost certainly marks the upper limit of navigation on the Brook. It is described in more detail below.

THE FORGE

Some 500 yards upstream from the second chamber the valley narrows. In this spot are situated the foundations of what must have been a fair sized mill, consisting of two main buildings situated on either side of a large overshot wheel. Nothing remains to be seen today among the tangled undergrowth except for part of the wheel chamber, the spillway and its sluice foundations, both constructed in the same robust manner as the 'locks'. As can be seen from the sketch map these buildings were constructed on an extremely narrow strip of land between the leat and the Brook and a good length of stone retaining wall along the Brook side still stands. Immediately below the Forge stands the Forge Cottage. This building is still inhabited but from its outside appearance looks to be not more than 150 years old. It is not clear exactly where boats ascending Dick Brook were unloaded. This may have taken place directly into the Forge or possibly on to a wharf in the open space just below, which is overlooked by the Forge Cottage. From the Forge two clearly inter-related features led us further up the valley. These were the empty bed of the leat and a well-defined cartway which first appears at the Forge Cottage.

THE LEAT

This is of relatively large section and does indeed look like the bed of a navigable canal at its lower end. Though now dry it can be traced almost half a mile further up the valley to a point where it tapped the Brook just below Glasshampton Bridge on the Stourport - Shrawley road. Here, staggered on either side of the Brook can be seen the abutments of the weir which at one time deflected the water down the leat to the Forge.

THE CARTWAY

This may seem an odd and unimportant feature of the landscape to describe, but in fact it led the authors almost to the spot where they were later shown the remains of the blast furnace described in the paragraph below. From the Forge, where it crosses the spillway on a large stone arch, this cartway runs along the crown of the southern abutment of the leat. Near Wood End Farm it crosses the leat and to all appearances terminates on joining the Shrawley Road a few yards from Glasshampton Bridge on the Stourport side. Opposite, however, a much overgrown track continues along the back of a well-kept half-timbered cottage. Following in the direction of this track, which soon ceased to be recognizable, we came across a single-arched bridge, now in an advanced stage of decay, spanning the Brook. Across this bridge we lost our trail completely but we were fortunate enough to be shown by Mr. Comley, of Bridge Farm, Glasshampton, the lower part of what must be one of the few seventeenth century blast furnaces to be seen in England today, and to which the cartway must originally have led.

THE FURNACE

The Furnace is not on Dick Brook itself but alongside a small tributary stream which, when dammed, would have provided power for the blast. The remaining stonework stands just below the dam of the former Sharpley Pool of the Glasshampton Estate. The part which is immediately visible consists of a section of the interior furnace lining, built again of sandstone which has run together and become glazed by intense heat. It has a diameter of about four feet at present soil level, and is about five feet high. This is clearly enough the lower part of the furnace and fragments of the foundations of the original casing wall can be seen nearby. Traces of stonework visible in the gulley-side some twenty feet above the base of the Furnace are almost certain to have been the footings of a bridge giving access to the furnace top which would have been at about this same height. An abundance of charcoal and slag for re-working has been observed at this level on the adjacent ground.

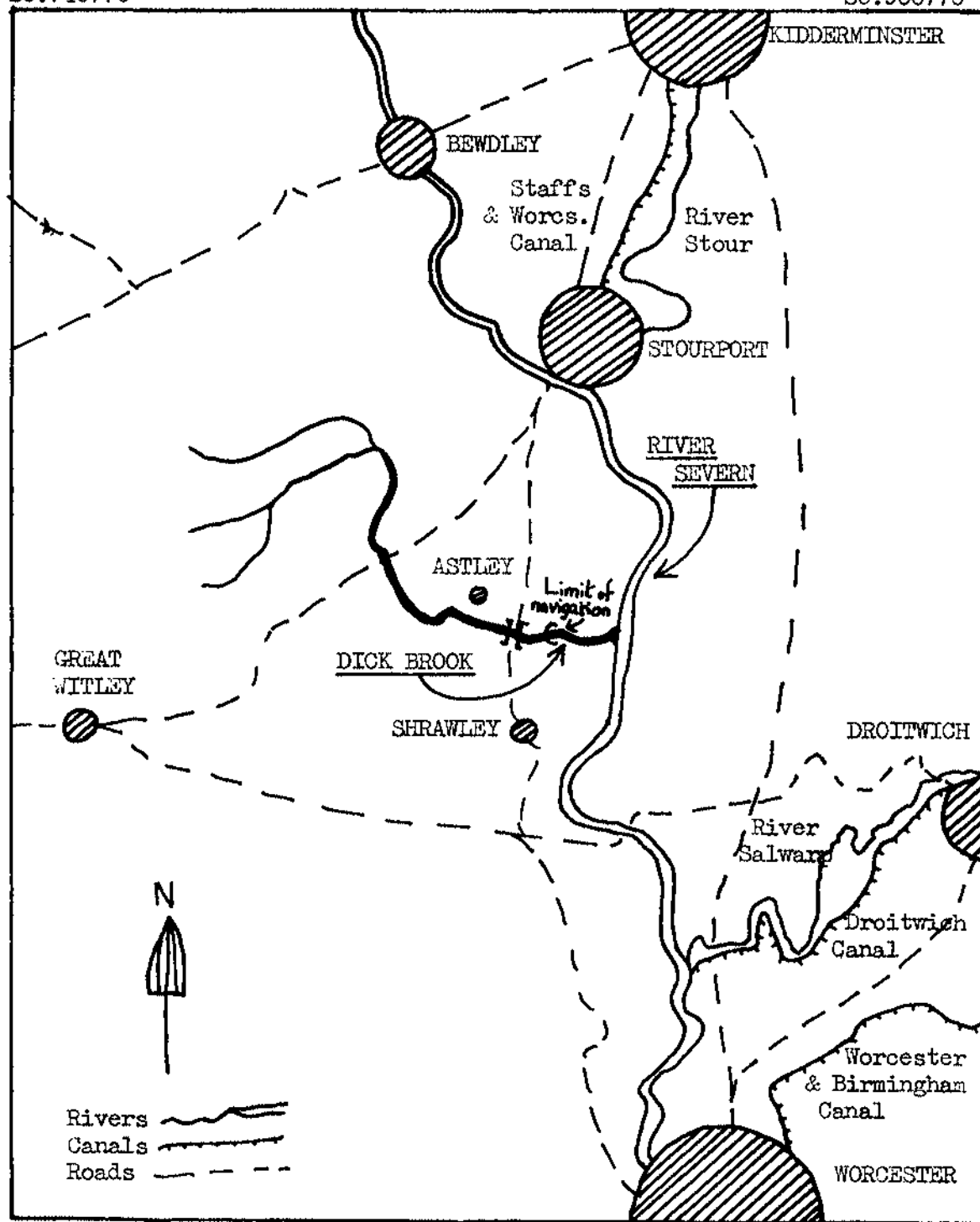
As to what connexion all this has with Andrew Yarranton and the navigation of Dick Brook we are largely indebted to the research carried out over thirty years ago by Mr. T. C. Cantrill and Miss Marjory Wight. Their findings were published as a paper entitled Yarranton's Works at Astley in the Transactions of the Worcestershire Archaeological Society in 1929 (Volume VI New Series) and probably cover just about all that is known about the early industrial activity on the Brook. What is in fact known is extremely limited and it seems quite likely that the records of the Glasshampton Estate, on which these remains stand, may well have been destroyed by fire when Glasshampton Park house was burnt to the ground in 1810.

Andrew Yarranton was born in the parish of Astley between 1616 and 1619. We know that he was working in Worcester as a linen-draper's apprentice in 1632 and later ran away; that he held a captain's commission in the Parliamentary Army in the Civil War; and, from one of his pamphlets, that he was still living at Astley in 1662 cultivating Dutch clover there. What is more important is that Yarranton tells us himself in his book England's Improvement by Sea and Land that in 1652 he "entered on ironworks and plied them several years." Again in his book, in an imaginary dialogue between a traveller (himself), a Cornish tin miner and an iron miner from the Forest of Dean, he makes the iron miner say that about twenty-eight years previously Mr. Yarranton had found a vast quantity of Roman cinders (presumably slag) near the city walls of Worcester and that he and others had carried many thousand of tons of them up the Severn to their iron-furnaces to be smelted into iron with a mixture of the Forest of Dean ironstone. This appears in England's Improvements, part 2, published in 1681, which would mean that the movement up river of slag would have been taking place by 1653.

No records are known to exist to show when the Astley Furnace was built. In view of its situation, however, it seems most likely that it would have gone out of use when the Sharpley and Lodge Pools

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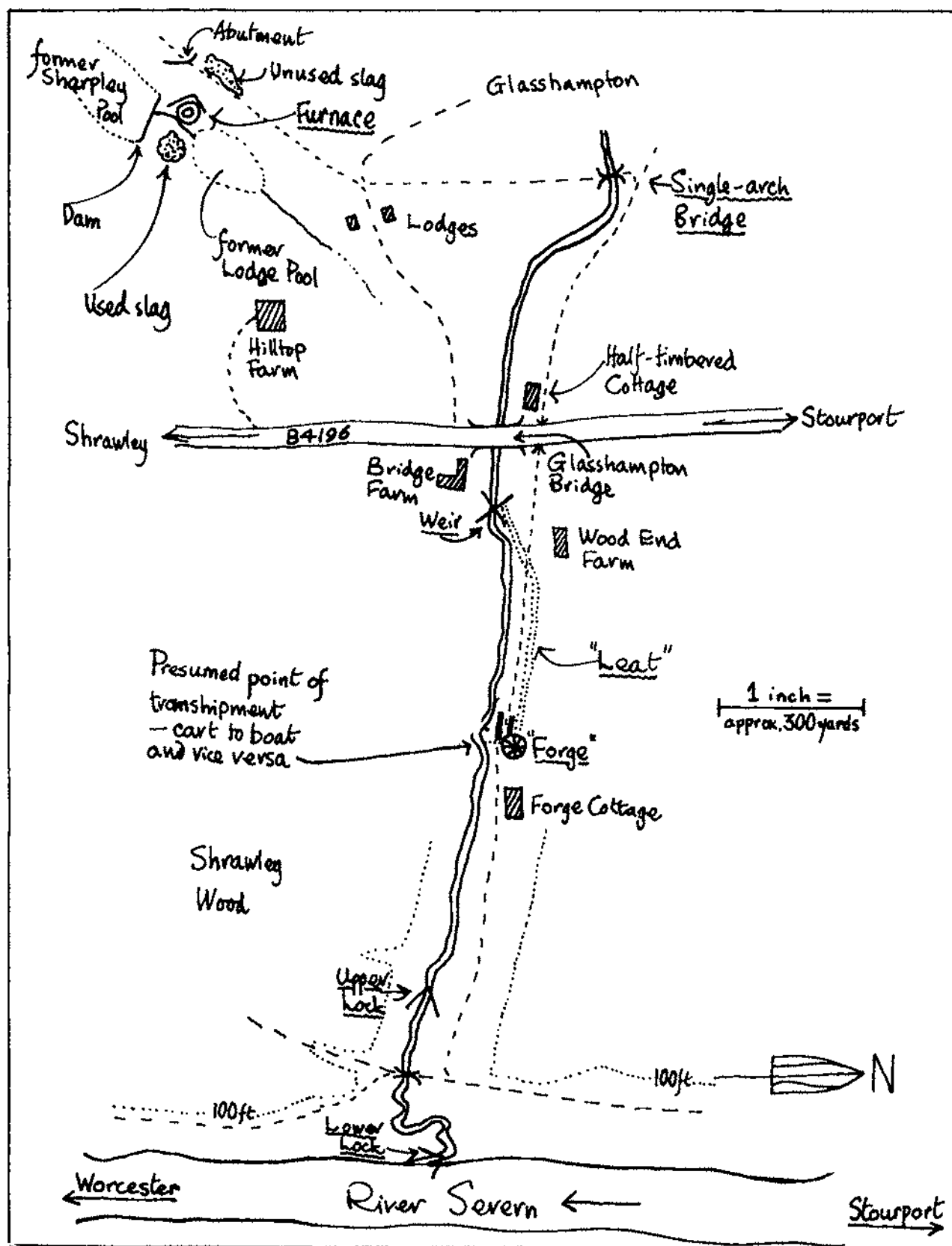
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DICK BROOK TODAY: general location



DICK BROOK : detail

were constructed as part of the ornamental landscape of Glasshampton Park when the house was erected in the late seventeenth or early eighteenth century. The architect of the house, John Watson, died in 1707. The lower or Lodge Pool virtually extended to the foot of the dam of Sharpley Pool and as can be seen from the sketch plan the remains of the Furnace are situated immediately below this dam. Through the years the Furnace seems to have become buried under rainwash swept down from the steep sloping hillside above. Indeed its presence was only revealed by a remarkable event which took place on the morning of the 1 June 1924. Torrential rain that fell during the night breached the dam immediately above where the Furnace stood, causing the rapid draining of seven-and-a-half acres of water. The torrent carried away the dam of the Lodge Pool below and also the bridge on the Stourport road. Furthermore, it scoured away many tons of earth that had settled over the Furnace and cut into the valley side behind it to reveal layers of slag and unused charcoal in addition to the bridge abutment already mentioned. This slag was analysed, report Miss Wight and Mr. Cantrill, and was found to be still rich in iron ore. Other slag deposits can be traced strewn about below the Furnace on the opposite bank of the valley. These had a much lower iron content and are almost certain to have been the waste from the Furnace. As Mr. Cantrill and Miss Wight point out, there would be little purpose in carting waste slag to be stacked in the hillside twenty feet above the base of the Furnace, especially when ample space existed for it to be strewn around below. There seems to be a good case therefore for the assumption that the stocks of slag found stored above the Furnace consist of Roman slag brought up river from Worcester.

The earliest known reference to the Forge (or Mill) appears in 1717 in the will of a Mrs. Mercy Pope. She left money, derived from her estate and "also of the Wood End (i.e. Wood End Farm) and the Mill therewith attached," for the founding and maintenance of a Free School in the parish. It is known too that by this time the mill was not being used as a Forge which seems to fit in with the closing down of the Furnace at the time of the construction of Sharpley Pool. In 1720 the buildings were being used for fulling purposes and in 1739 they were leased to Arnold Boughton of Hopton Wafers as a paper mill. The grinding of flint was also carried out there later in the eighteenth century and with the establishment of the Worcester Porcelain works nearby it is quite likely that there was communication by water between the two places. By about 1803 the mill was again being used as a forge and it seems most likely that the existing 'Forge Cottage' was erected during this period.

Of the locks or watergates no written record seems to exist at all. The navigation which they served almost certainly never extended above the Forge and, as has been suggested above, there was probably a wharf by the Forge, both of which were served by the Cartway. It is worthwhile pointing out that, in 1655, three years after Yarranton was bringing his Roman slag up river, presumably to Dick Brook, he was engaged in an undertaking with a Captain Wall "to meke

the river Salwarpe navigable and procure letters patent for doing it from the Protector." This may or may not have been carried into execution at the time, but at least it shows that Yarranton was putting into practice his ideas about inland navigation in an area no more than six miles distant from Astley. Yarranton tells us too in England's Improvement of his activities on the River Stour, which joins the Severn about two-and-a-half miles upstream from Dick Brook, and which he claimed to have made navigable from Stourbridge to Kidderminster and to have carried many hundred tons of coal down it.

The authors are inclined to the view that the navigation works, the forge and the furnace at Astley were built by Yarranton and that they are in fact the ironworks he tells us he entered upon in about 1652. The building of 'locks' on so short a length of navigation hardly seems justified except when viewed as the work of an enthusiast with money to spend experimenting with his ideas. It may well be that those were his first 'locks' and that the experience gained from their construction and operation enabled him to undertake the work of making the neighbouring rivers Stour and Salwarpe navigable. The authors' interpretation of the visible remains and the little written evidence available is that the navigation was constructed to enable boats to carry slag and ironstone to a wharf near the Forge where they were unloaded and the contents taken by cart along the track to the Furnace. We know that slag was re-smelted in the Furnace during the seventeenth century and it seems quite probable that this was the Roman slag from Worcester which Yarranton tells us he brought up river. At the Furnace these raw materials were smelted and cast as pig iron which would then have been carted back to the Forge for working and hammering. The products could then be loaded into the boats to be carried downstream again through the watergates to the Severn.

Everything points therefore to the conclusion that this remarkable pocket of industry does in fact provide some tangible link with the activities of Andrew Yarranton as an ironmaster and promoter of inland navigation in the years following the Civil War. Without further documentary evidence we cannot be certain. But we do know that no other ironmaster is recorded as having been associated with Astley where Yarranton was born and that if his ironworks were situated elsewhere they have still to be discovered.

Finally, if it is accepted that these ironworks were Yarranton's then there can be little doubt that Andrew Yarranton also built the navigation works which can be seen today on Dick Brook.

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It is regretted that, owing to lack of space, the final instalment of THE OAKHAM CANAL, by M. Talbot Smith, has had to be held over until the July issue of the Journal.

AN EARLY RAILWAY ACCIDENT AT HARROW

By G. O. Holt

On the morning of 12 November 1840, locomotive No. 90 of the London & Birmingham Railway was working a down goods train near Harrow when the crank axle broke. A message to this effect was sent back to Camden, and two locomotives (Nos. 15 and 3) were despatched to Harrow to take the train forward. The fireman of the disabled No. 90, whose name was Finch, was transferred to No. 15, and so began a day which he would almost certainly remember as long as he lived.

Having gone as far as Tring with the goods train, No. 15 returned running light towards London in the early afternoon. Approaching Harrow about 2.30, a policeman signalled the driver, James Bradburn, to stop, and instructed him to proceed cautiously as there had been an accident at Woodcock Hill, about $1\frac{1}{2}$ miles further on. Part of the 10.0 am merchandise train from Birmingham was derailed there, a wagon axle having broken. For the next three hours or so No. 15 was used to convey messages between Woodcock Hill and Harrow station, arrangements being made for all up trains to cross to the down line at Harrow.

This primitive form of "single line working" was in the hands of Mr. John Bedford, superintendent of the Company's police, who was in charge of operations at Woodcock Hill where some 40 or 50 men were clearing the up line, and towards 6.0 pm, Mr. Bedford sent No. 15 to Harrow on the blocked road with instructions that up trains were to be held there until the 6 o'clock down train had passed. He also told the driver to order refreshments from a public house called the Queen's Arms close to the station. Having delivered the message to the policeman at Harrow, Driver Bradburn left his engine on the up line in charge of Fireman Finch, telling him that if an up train approached he should start the engine and move towards London, out of its way. As he approached the Queen's Arms, Bradburn heard the sound of a train coming up, and ran back towards the station.

Finch had heard the approaching train too, and started No. 15 as he had been told, but before he had gone more than a few yards he realised that he would be overtaken. He shut off steam and jumped clear just before an up goods train, worked by two engines, ran into his engine. As a result of the collision, Dawson, fireman of the leading engine, and Simpson, the driver of the train engine, were killed.

This goods train of 27 wagons had left Wolverton about four o'clock in the afternoon. The train engine was No. 82 and engine No. 1 (which was returning to Camden after repairs at the works) was attached in front. In giving his evidence at the inquest the driver of No. 1 described how, on approaching Harrow, he saw a red light

held up by the policeman. He shut off steam and "lifted the valve but did not blow the whistle", which was evidently the recognized way of signalling to the driver of the second engine and the guard, the escaping steam making "a loud sharp noise." He reversed the engine before jumping clear, but Dawson remained on the footplate attending to the brake, and was killed.

Simpson, the driver of the train engine, did not shut off steam although there could be no doubt that he saw the policeman's danger signal. When the collision occurred his engine was still in forward gear. His fireman, Quinlan, gave evidence that the train had stopped at Leighton, Boxmoor and Watford, and it appeared that some warning of the derailment beyond Harrow had been given to Simpson, who became flurried and angry with the policeman who stopped him. Approaching Harrow he had ignored the warning and, seeing No.15 engine on the line ahead, Quinlan had said "It is time for us to be jumping off now." Simpson made no reply and was still on the footplate when Quinlan jumped clear. There was other evidence of Simpson's recklessness. Finch (who had been his fireman at one time) said he was a fast driver and "very fond of sitting down on the seat by the handrailing of the footplate." Quinlan gave further evidence that he had been in the habit of "running hard", seldom looking ahead, and on another occasion had knocked down a board raised to a height of five feet "that was put up as a signal to stop him." The brakeman also described Simpson as a fast driver, although he said he had previously seen another train following his, and told Simpson so at Boxmoor.

Amongst the officers who gave evidence was Edward Bury, Superintendent of the Locomotive Department, who said Simpson had been employed by the Newcastle & Carlisle Company, and came to the London & Birmingham with a good character. Bury had intended to remit a fine of £1 "paid by Simpson a few weeks ago in consequence of an alleged complaint that he neglected a signal, because it was proved that no signal was exhibited." He doubted whether the whistle was a satisfactory signal because of the speed with which engines travelled and the practice of the men to "tie up their ears" to keep warm. Bury also stated that London & Birmingham drivers were paid from £2 to £2.15. 0 a week.

There was other evidence which throws some light on the ways of the London & Birmingham. Evidently there were no buffers on the goods wagons, and an additional guard employed by Pickfords was travelling with the train. The driver of an Aylesbury train which passed Harrow shortly before the collision said he could not read, but had "a printed list of instructions which his wife constantly read over to him before going on duty."

In summing up, the Coroner said he imputed no blame to the Company, but dwelt upon the responsibilities of its servants. The jury found Simpson guilty of the wilful murder of Dawson and of

felo de se in his own case. They imposed a deodand of £2,000 on the engines Nos. 15 and 82 and their tenders, and added that they were "forcibly struck with the ignorance of the executive of the numerous acts of disobedience and carelessness" of Simpson, and attributed great blame to the Directors for employing such a reckless driver.

Sir Frederick Smith subsequently reported to the Board of Trade on the accident, and found the primary cause to be the misconduct of the driver. He thought that defective arrangements on the part of the Company were a secondary cause and said that as London & Birmingham goods trains did not work to a time table there could be no check upon them to prevent excessive speed. The Company was also blamed for its "backwardness in enforcing a strict system of discipline essential for public safety."

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THE WANSFORD MYSTERY

By C. R. Clinker

Whilst reading the printed minutes of meetings of the London & North Western Railway Chief Officers held during 1878, I extracted an entry which reported the opening of the junction with the Great Northern Railway at Wansford on 1 March 1878, and extension of that Company's trains to and from the L. & N.W. station. Sibson station was said to have been closed on the same date.

This set me thinking. Surely the Stamford & Essendine Railway's Stamford to Wansford line had been opened some years before this? If so, why this report of the opening of a junction?

I decided that a visit to the spot would be useful to refresh my memory of the lie of the land (I had not been there since closing day of the branch in 1929) and invited our members Mr. Illingworth (Stamford) and Mr. Webb (Market Harborough) to join me. I had formed a theory that, for one reason or another, the S. & E. had not originally been physically connected to the L. & N.W. If this was correct, then they must have built a separate station at the end of their line and short of the point where the junction might normally be expected. In fact, we found no trace of any such station, and very little space on which it could have stood. Moreover, the only possible site was on the east bank of the River Nene, whilst the L. & N.W. station was, and still is, on the west bank. But exploration revealed a footbridge slung alongside the L. & N.W. river bridge and from the foot of the stairs, part of a stepping-way made of stone sleepers led towards the possible site of the S. & E. terminus. The Blisworth-Peterborough branch of the London & Birmingham Railway, opened on 2 June 1845, was originally a single track on stone sleepers. When doubled in 1846-7 both tracks were laid on wood sleepers. Nothing was more natural, therefore, than using up these blocks for the stepping-way over some marshy ground.

Mr. Illingworth promised to read the Stamford Mercury's reports of the opening of the Stamford-Wansford branch on 8 August 1867 to see whether the terminal point was referred to. He subsequently sent me extracts from these. They referred to the junction with the L. & N.W. and to that Company's station as being used by the Stamford trains. It was clear that something had occurred later to cause severance of the junction.

An examination of timetables was now commenced with the assistance of Mr. Greville. This showed that the L. & N.W. station was known as "Wansford (Sibson)" from its opening with the line in 1845 until April 1880; thereafter it was "Wansford." The G.N.R. tables in Bradshaw referred to the Stamford branch terminus as "Wansford (Sibson)" up to December 1869. From January 1870 to February 1878 inclusive it was shown as "Sibson S. & E.", in March 1878 it became "Wansford (Sibson) L.N.W. sta." The resumption of running to and from the L. & N.W. station in March 1878 agreed with the minute which had set all these enquiries in train. What then had happened between January 1870 and March 1878.

Mr. Greville consulted the S. & E. Company's minute books and found two entries which gave a clue to, if not a full explanation of, the enigma. On 16 March 1869 (less than two years after the Stamford branch was opened) the Secretary was instructed to write to the L. & N.W. Company asking for the best terms on which the use of their station could be continued. He reported on 23 October that the L. & N.W. had refused to reduce the rent. We do not know what the rent was, nor are there any further relevant entries in the minute books, but it is obvious the terms were unacceptable to the S. & E. who were then forced to withdraw their trains and provide the nebulous "Sibson S. & E." station.

The subject seems to have lain dormant for three years until the preliminaries to drafting the Bill for the L. & N.W. 'cut-off' line from Seaton to Yarwell Junction were being considered. The Act for this line (36 & 37 Vic. cap. clvi, 21 June 1873) confirmed and had scheduled to it a long and most interesting Articles of Agreement, signed on 19 May 1873, between the Marquis of Exeter, the G.N., S. & E. and L. & N.W. Railways. This is packed with information on the inter-connexion between the first three mentioned parties as to the legal position of the Wansford-Stamford line (referred to as the "Sibson Railway"), its ownership by the S. & E. and "the great interest" taken in it by the Marquis of Exeter. Some of this may already be known, but I suspect not all.

The Agreement confirmed that there was at this date no physical connexion between the two railways at Wansford, and that there was a separate station named "Sibson". It provided for restoration of the junction by the L. & N.W. within five years and granted running powers for all classes of traffic over the Wansford-Stamford Branch; I have been unable to find that these powers were ever exercised.

The signal box controlling Sibson Station was to be transferred to the L. & N.W. who would staff it at G.N. expense and control the replaced junction. The signal-box became "Wansford Junction" and remained in use until sometime between 1907 and 1912 when it was removed and control of the junction transferred to the signal-box at Wansford station.

The final stages of the story are simply told. The L. & N.E. withdrew the passenger and mixed trains from the Wansford-Stamford branch as from 1 July 1929 and closed the line to all traffic. On 1 July 1957 British Railways closed Wansford station for public passenger traffic, but certain trains still call there for the accommodation of the Commission's staff.

I am very grateful to Messrs. Illingworth and Greville for their help in this small piece of "cooperative research" which has resulted in clearing up the mystery of unusual happenings at Wansford.

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A SHORT HISTORY OF THE BRADFORD CANAL

By Gordon Biddle

Continued from p. 37.

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The worsted industry and its allied trades use great quantities of water, and for a century or more Bradford was faced with frequent and critical shortages of supply as the town grew and demand increased. The Upper Nidderdale reservoirs, constructed between 1893 and 1930, finally solved the problem. A heavy demand for water troubled the Canal Company from the outset, finally leading to its ruin, and the supply from the beck was insufficient during times of drought owing to the use of its water by mills and dyehouses upstream. In order to safeguard their supply, therefore, the company embarked upon a policy of purchasing a number of premises lining the beck, with their attendant water rights, and between 1775 and 1798 considerable sums were spent. Later, doubts were raised as to the legality of those transactions, so on 22 June 1802, an Act was obtained discharging the company from all claims by the Crown under the Mortmain Acts, the Crown waiving the rights to forfeiture. Various estates, purchased for building the canal itself and warehouses at Bradford, were also included.

Troubles over water supply were to bedevil the Bradford Canal throughout its existence. As early as August 1774 the Leeds Intelligencer reported an action against the company by John Balme, tenant of a corn mill, for diverting water from Bowling Mill Beck into the canal, thus lowering the level of Bradford Beck, which fed his mill-

race. As the company was negotiating the purchase of the mill anyway, Balme was awarded nominal damages of one shilling with costs.

The town grew as industry expanded, with the help of improved transport by water, and the head of the canal at Broadstones was soon in the centre of the town instead of outside it. As greater demands were made on the water of the Beck, so its meagre supply was used over and over again by the mills lining its banks. Industrial and domestic sewage discharged into it so that by the time its polluted waters were diverted into the near-stagnant canal a considerable stench arose from the summit pound. In summer it was particularly bad, as the beck itself, low in water and rendered slow-moving by the company's sluice-gates damming its path, added to the odour. A report by the Board of Surveyors in March 1844 adds that not only did drains discharge into the beck but also into the canal, and that the state of the water was worsened by its use under contract by canal-side mill owners for feeding their boilers, whence it was returned to its source. As a result, the canal was scarcely ever cool. The mills were compelled to use canal water as the sluice-gates in the beck rendered its lower portion too shallow for them. Thus were the Canal Company largely the authors of their own misfortune.

In 1849 matters came to a head. Already regarded by many as a public nuisance, a bad outbreak of cholera all over the country brought forth the cry that the 406 deaths in Bradford would have been much reduced were it not for the canal menace. Letters appeared in the press demanding closure and filling in. The Sanitary Committee of the Town Council had certified the canal to be a nuisance for years, but without effect. Too many men of business depended on it, although the epidemic temporarily silenced even the most influential canal supporters. The Council drew up an Improvement Bill which sought wide powers for mitigating the appalling sanitary conditions in the borough. Among them were clauses for purchasing the gas and water works, and the canal. The sum of £100,000 was to be raised by public loan for this purpose, and upon completion the Council would have authority to close the canal and sell the land, the proceeds to go towards paying off the principal. The Bill was duly approved and deposited for the 1850 session, but in January and February 1850, a number of disclosures was made at stormy Council meetings.

The Leeds & Bradford Railway had been opened in 1844, and the Railway Mania resulted in the rapid extension of lines in the West Riding, as elsewhere. Consequently, the Bradford Canal board suffered from a bad attack of cold feet and let it be known that they were willing to sell. But a majority of the shareholders, backed by the quarry owners, iron-masters and the Leeds & Liverpool, refused to panic, and upon publication of the Improvement Bill insisted upon giving notice of opposition. As the leaders of the opposition were either members of, or had influence with, the Council, the clauses regarding sale and purchase were dropped, and the loan reduced to £50,000. A revised Bill was approved, from which it was apparent

that the Canal Company had carefully avoided opposing powers to close the canal, but concentrated on the clauses providing the means of closure. Powers to enforce cleansing of the beck were left in, as a sop to the canal antagonists, and on the whole the canal supporters won the day with surprising ease. Perhaps this can be partly attributed to a greater row raging over the Town Clerk's salary.

In 1853, the company had its own back. During a severe drought the Town Council took water from Chellow Dene Beck, whereupon the company commenced an action restraining the Council, contending that the water flowed into Bradford Beck and thus formed part of their statutory supply. After the case had run its slow course through the courts, the Canal Company was awarded £100 damages in 1856, while an offer from the Council to buy the water for £20 a year was loftily refused.

The company seems to have made a habit of leasing the canal from time to time, as various references speak of "the proprietors and lessees." For instance, in 1859, it was leased to a pair of lime-burners, Messrs. Crowther and Dixon, for seven years. No doubt this was to their advantage as the Low Moor and Bowling Ironworks depended at this time upon the canal for their entire supply of limestone.

Meanwhile, as expansion continued the canal nuisance got worse. The summer of 1864 was particularly hot, and the water supply trouble, which had grown correspondingly acute, combined with the smell to force a fresh approach to the problem. Negotiation with the company having proved useless, a group of industrialists whose works were in the canal area of the town, but who did not rely upon it for transport, formed a private committee to indict the company with causing a public nuisance. They were ably abetted by the Bradford Observer which, in a second leader of 21 July 1864 referred to a "Witch broth", "worse than channel-house effluvia", "that seething cauldron of all impurity, the Bradford Canal," and much more in like vein.

One section of opinion favoured action by the Council, so before going to law the committee deputed its leader, John Culpan of Valley Dye Works, to send a letter of complaint to the Town Clerk. As the Council gave encouragement but no tangible support, the Committee established a fund to take their case to court. Their main premise was that it was illegal for the Canal Company to take water from Bradford Beck at all, as the Act of Incorporation specifically mentioned Bowling Mill Beck, which entered Bradford Beck near the canal head. This was undoubtedly true, as also was the fact that the supply of water from Bradford Beck was much better than that from its tributary. Again, it was pointed out that by illegally using Bradford Beck the company had avoided the expense of building the reservoirs authorized in the same Act. On the other hand, the canal had used this supply for nigh on a century, which use had in some measure been confirmed in the action against the Council in 1853. Small wonder that the Council were so chary of entering the dispute, until the Canal Company forced them into it by promptly

placing upon them the onus of abating the stench by declaring that if they carried out their duty of cleaning the beck, the canal would not receive the polluted water.

About this time a new main sewer was being laid in Canal Road, which separated the beck and the canal. This meant that the sewer must pass beneath the feeder culvert where it crossed under the road to the canal, and the Council undertook to make good any damage on the understanding that it did not constitute an acknowledgement of the Canal Company's right to divert the beck. The Company demanded an unconditional guarantee which was refused, whereupon they fully opened the sluice-gates and padlocked them in position. The portion of the culvert exposed by the excavations proved unequal to the volume of water, burst under the pressure and flooded the workings. Several Council workmen had narrow escapes, and as the Observer commented acidly, "had to scramble for their lives to save themselves from the hot vapour bath of the beck and the fragrant porridge of the canal." The sluice-gates were forcibly closed and the breach patched, after which the new sewer went forward without interference. Canal and Council preserved a discreet silence.

At the Yorkshire Spring Assizes, 1865, the case of "The Queen versus The Bradford Navigation (proprietors and lessees)" was heard before Baron Martin. The plaintiffs alleged that the Act of Incorporation authorized the use of Bowling Beck only, not Bradford Beck as well, and that if the supply from Bowling Beck had proved insufficient the company should have built reservoirs. In their defence, the Canal Company admitted the nuisance but pleaded that they were powerless to prevent it in the absence of any other source of water, and that the Council should clean the beck. They felt that they ought to be prosecuting the Council for allowing the beck to be fouled. As there was no dispute of facts but purely a question of law, the judge referred the case to a higher court, and the canal continued to smell a little longer.

(To be continued)

BACK ISSUES OF THE JOURNAL

A number of members have asked for back issues of the Journal which are now out of print. If any member wishes to dispose of his copies, would he please inform the Editor, who will gladly make arrangements to forward them to those requiring them.

Summer School, York, 23 to 30 August: "A History of Railway Architecture in Britain". Applications not later than 7 July. For details apply: Director, Institute of Architectural Study, Micklegate, York.

TRANSPORT EXHIBITION AT NORTHAMPTON.

"Transport and Communications in Northamptonshire" was the theme of the first large-scale exhibition to be arranged by the Northamptonshire Archives Committee in Northampton, during February 1958. The Committee is custodian of a rich stock of documentary material extending over several centuries, hitherto housed at Lamport Hall but shortly to be transferred to Delapre Abbey, just outside Northampton, which has been secured as the result of a successful appeal. The great wealth of the collection, and the important position of the county in the very centre of England, made it likely that an interesting display could be achieved; and in fact the documents, maps, photographs and prints on show from the collection or loaned for the occasion, together with some museum objects and exhibits (principally on the canal side), had been laid out by Mr. P. I. King, the County Archivist, in a way that was satisfactory both from the visual point of view and, on closer inspection, from the historian's.

The five sections in the exhibition were: Roads and Bridges, with some particularly turnpike material; River Navigation - in effect, the River Nene; Canals, with logging boards and a cleaning brush from the Blisworth Tunnel and a splendid map of the Leicestershire & Northamptonshire Union Canal of about 1793 as the outstanding items; Railways, with much interesting printed material, including some scarce booklets - the Blisworth and Peterborough Guide of 1845; the East & West Junction one of 1886; and Markham's Iron Roads of Northamptonshire (1904), and a page from the parish register of Roads in the year 1837, both baptisms and burials reflecting the activity of the railway constructors on the London & Birmingham; and finally Vehicles, including interesting documents on the Northampton tramways and a fine selection of illustrations of coachwork by Mulliner's, well established in the town in the 19th century.

Guildhall Road, where the exhibition was held, owed its existence to the Midland Railway, being built as an approach to its station in St. John's Street in 1871. This point was made in an admirable catalogue on sale; and the whole display was calculated to interest, in some way or other, both the casual visitor and the transport historian. We commend the example to other towns and counties!

(From MICHAEL ROBBINS)

* * * * *

CORRESPONDENCE

Sir, - In shortening and rewriting my article "Field Work in the Lincolnshire Fens" a serious error has been made. The last paragraph reads: "Exploration of the railway was somewhat difficult because several parts of it have been taken up, including a portion of the 'main line', so that the remaining branches, although quite extensive, are now separated." None of the main line has been taken up and all the branches are connected. I know of one instance (the branch to Dunston pigsties) where only the pigsty end of the branch is in use, but the rails connecting the sties to the rest of the railway, although not used and considerably overgrown, are still in position. In the Railway Magazine for November 1957 is an article entitled "A Lincolnshire Agricultural Railway". There are two photographs of the line and the historical details in the article are more accurate than those which I gave. However, the map on p. 762 contains many inaccuracies and many lines are not shown. It would be interesting if the gradient of the branch from Wasp's Nest to the gravel quarry and the rubbish dump could be accurately measured. In my opinion it is steeper than 1 in 10. It may be the steepest locomotive work gradient in the country.

ALAN RICHARDSON.

(The error is regretted. Unfortunately, owing to the great length of the article, it had to be shortened in order to bring out the salient features, owing to pressure of space. - Ed.)

Sir, - I read with interest the letter from Peter Norton on Field Work, which was published in the March issue. May I, as the "someone else" referred to in this letter, add my comments? As one who has little knowledge of the operation of a camera beyond the pressing of a shutter release to take the picture, I found that it was not possible always to gain the best photographic record of my surveys. By teaming up with someone else whose photographic ability is much better than mine, it has been possible to begin a proper survey of canals in Lancashire and Cheshire. Our plan of campaign is as follows: having chosen the canal to be covered, I proceed to seek out all possible information that is available from documents, etc. in local libraries and record offices. This information is then noted, and the canal is surveyed on foot to enable the information to be compared with present groundwork of the canal. Having noted the points that require photographic record, my colleague joins me and such items are photographed for the Society's records and our own. By this means we find that one makes the best possible use of the time available. We feel that such combined team work enables the ground to be covered more adequately.

A. P. VOCE.

Sir, - I was most interested in the article on the Metropolitan Railway in broad gauge days, and particularly that part which dealt with the connexion to Liverpool Street station. The site of the old junction can still be observed when entering Liverpool Street (Met.) and it may not be generally known that quite a long stretch of the old tunnel is now in daily use, but of course for purposes other than that for which it was constructed. Part of the tunnel is now the Liverpool Street railway dining club and leading on from that and extending to within about twenty yards of Platform One has been built the gymnasium, also for railway staff. Incidentally, the Railway Arts & Crafts Exhibition for the Eastern Region is being held in the gymnasium this year from 14 to 17 May, and this would afford an opportunity for anyone interested to do a little exploring on railway property to which they would not normally be admitted.

H. LEAH.

Sir,

DEATH OF A RAILWAY

Railways have died before now: several complete and once flourishing concerns in the United States, the many narrow-gauge lines which have disappeared in the British Isles in the last thirty years, and nearly all of one standard-gauge railway in the United Kingdom, the Belfast & County Down, in 1950. The complete closing of a large part of the lines of the Great Northern Railway Board in Northern Ireland, and of the Sligo, Leitrim & Northern Counties Railway on 1 October 1957 has, however, shocked me into thinking about what the process - the closing of railways, which we have been seeing piecemeal for these many years, and particularly in this decade - actually means, and wondering whether we should not make a case study of the process, by getting at the facts in this instance, before it is too late. What is shocking about the G.N.(I) closings is their extent and completeness and the lack, apparently, of any long warning or public protest. According to the Railway Magazine (November 1957) the closings are as follows: Portadown to Glaslough; Omega-Enniskillen-Clones; Fintona branch; Bundoran branch (105 miles); Sligo & Leitrim (41 miles) - all closed completely 1 October 1957. Dundalk to Clones; Clones to Glaslough; Clones to Cavan; Belturbet branch (76 miles) - closed to passengers 14 October 1957. Total 222 miles. 222 miles closed to passengers at one fell swoop. Important towns like Enniskillen and Armagh lose all rail connexion, and others like Clones and Cavan lose all railway passenger service. There may be many more such large-scale closings, in Great Britain and Ireland, in the next few years, though one hopes not. The government of Northern Ireland seems to have been particularly hostile to railways. While the event is fresh - still, as it were, in process - it should be studied. The questions I have in mind are:

I. WHY?

Geography, economy, population of the area; history of these railways; earlier losses on them; formation of G.N. Rly Board; traffic

expenses and receipts (recently and in previous comparable periods); attempts to cut losses and keep the lines open; policies of the government of Northern Ireland on transport; public enquiries ahead of the closings - questions in Parliament or Dail; who decided to close - how, when and why was the decision taken?; any consultation with the trade unions; any union objections or safeguards taken by the Board.

II. EFFECTS.

Actual savings by closing lines completely; savings by closing lines to passengers; profit or loss on lines remaining open to goods; process of demolition; proceeds of sales of scrap materials from demolition; use of salvaged materials not sold; sale or lease of site of track, yards, station buildings, houses, goods sheds, etc.; receipts from these sources; provision of staff displaced; work the men dismissed take up, whether in the district or after moving away; provision of alternative facilities (bus services, lorry services for goods, including coal bricks and other bulky items, parcel services); increase or decrease of fares and freight rates following the transfer of facilities from rail to road; any resulting increases in local coal prices for example?

Doubtless there are many other questions which should be asked if the death of a railway is to be studied. These may do for a start. My point is that someone should be making the study now: getting facts and figures from the G.N. Board and the governments and local authorities concerned, from trade unions, traders, etc., interviewing the stationmasters, signalmen, porters and gangers displaced, photographing stations and other sites before and after demolition, and in general writing the "current history" of the subject. This is the obverse of the usual work of the railway historian, studying the remote beginnings and development of railways. It is a sad task, but an interesting one, and as real a part of railway history, which must take account of failures as much as successes, as any other. It has the advantage that it can be done from recent records (if accessible!) and from living testimony. I hope someone will undertake it, and thus advance the cause of railway history, studied as part of the social and economic history of the country. So far, this event seems to have passed with strangely little notice; we are becoming inured to these things. The Railway Press has had one or two brief notices and paragraphs about it, but none of these is likely to give the event the sort of study I have outlined.

Who is to do it? Should it be one of the railway societies? The Journal of Transport History? Railway-minded social and economic historians, staff or students, at Leicester, London School of Economics, Queen's University, Belfast, or some other University? I can only raise questions which ought to be answered before much of the material and evidence for such a study disappears, and hope that someone will come forward to undertake it.

C. L. MOWAT.

NEWS FROM THE SOCIETYHON. SECRETARY'S NOTESNew Members

BAILEY, J. A.	277, Market Street, Eastleigh, Hants.
BUCKLER, Dr. J. W.	44, Chippingham Street, Sheffield, 9.
COSWAY, G. J.	175, Eastcombe Avenue, Charlton, London, S.E.7.
MOSLEY, A. V.	74, St. Wilfrid's Rd, West Hallam, Derbyshire.
ROWBOTHAM, D. A.	19, Albert Grove, Derby Road, Nottingham.
SELICK, R. J.	62, Callow Hill Road, Alvechurch, Worcs.
WALKER, Neil A.	24, Manor Avenue, Caterham, Surrey.

Change of Address

ANDREWS, Dr. M. J.	Dreadnought Seamen's Hospital, Greenwich, S.E.10.
PALMER, A. R.	13, Salisbury Drive, Kidderminster, Worcs. (To be amended in Membership list).
SHEARAN, P.D.	20, Chapel Park Road, St. Leonard's, Sussex.
WEBB, G. N.	17, The Circle, Cricklewood, London, N.W.2.

Membership Engraved Name Badges

It has been suggested that members may care to have small ivory badges bearing their name to wear at meetings, as a ready means of identification and a way of promoting friendship between members. Council members have ordered badges and, at the time of going to press, it is hoped to have these for the A.G.M., so that other members may see them. The cost is 3/- each, and badges may be ordered from the Hon. Secretary, stating the style in which the name is to be engraved.

North Western Local Group

A meeting was held at Stockport on 22 March, when a local group for the North West was formed. The Chairman is Mr. B. Baxter, Hon. Treasurer Mr. P. A. Norton, Hon. Secretary Mr. A. P. Voce, to whom enquiries should be addressed at 10, Danesbury Road, Bolton, Lancs. Mr. J. I. C. Boyd undertook to serve on the committee temporarily. It is proposed to hold six meetings a year, two during the winter and four between April and September. The next meeting is to be held on 21 June, when a visit will be made to the railways around Mow Cop.

REPORTS ON EVENTS

North West. As reported above, the inaugural meeting of this Group was held on 22 March at Stockport, with Mr. W.J. Skillern in the Chair. The President gave an introduction to the Society, and its aims. Mr. B. Baxter gave an address on "Early Railways around Mow Cop." Twenty-three members and guests were present.

FORTHCOMING EVENTS

June 7: Middleton Colliery Railway. (See enclosed circular).

July 19: Netherton Tunnel. The Netherton Tunnel, 3027 yards long, on the Birmingham Canal Navigations, was the last canal tunnel to be built in this country. It was opened on 20 August 1858, having cost £302,000, much expense having been caused by tunnelling through ground heavily penetrated by old mine workings. The Society is celebrating this centenary by a special trip through the tunnel. The boat used will be the "Lady Hatherton", the former committee-boat of the Staffs. & Worcs. Canal Company. The trip will start from a wharf on the south side of Netherton Tunnel at 12.30 p.m. Arrangements will be made to run a bus from the centre of Birmingham to the wharf. After passing through the tunnel the boat will join the main line of the Birmingham Canal by Dudley Port station, and will then run through to Worcester Bar, in the centre of Birmingham, by about 6 p.m. The charge for the boat trip will be 12/6, and for the bus from Birmingham to Netherton Tunnel 5/-. Those who do not like tunnels may be picked up by the Dudley Port station at about 12.50 p.m. The boat is well protected against any unusual Birmingham weather. Bookings should be made to the Programme Secretary, Miss K. M. Stephens, 20, Colwyn Avenue, Derby. Those booking will be sent a detailed itinerary and information about the pick-up points for the bus in Birmingham, and the boat at Netherton Wharf and Dudley Port, and also historical notes.

JOURNAL

Back numbers are still available at 2/- each post free. These numbers are as follows: 1956 March, July, September; 1957 March, May, July, September, November; 1958 January, March.

ANNUAL GENERAL MEETING

At the A.G.M. held at Croydon on 26 April the following appointments to the Council were made:

Hon. Secretary: Mr. M. I. Berrill, Grotes Lodge, Blackheath Village, London, S.E.3.

Hon. Treasurer: Mr. F.G.M. Watson, 12a, Wilson House, Albion Avenue, London, S.W.8.

Will members please note this amendment on the front page of this issue?

PHOTOGRAPHIC COMPETITION

This has had to be cancelled, as there were only two entries. The Council would be interested to hear from members who may be able to express an opinion as to why there was this lack of interest.