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THE CHAIRMAN

Mr. Charles F. Klapper, well-known to many members of the Society as Editor of Modern Transport, was born in 1905 at Bromley-by-Bow, London. When he moved house to get married he went, as he himself says, "with some lack of originality" to Bromley, Kent.

Although he began training for a scientific career, "some fortunately gloomy examination results" deterred him so that on leaving school he joined a road haulage undertaking for some years, taking up free lance journalism in 1932.

He joined the editorial staff of Modern Transport in 1935, became assistant Editor in 1941, associate Editor in 1950, and succeeded to the editorial chair in 1953. He is the permanent regional delegate in Great Britain of the International Container Bureau, and was for six years Chairman of the Metropolitan Graduate and Student Society of the Institute of Transport, and he is Chairman-elect of the Metropolitan section of that body.

Apart from the serious day to day business of transport, he is interested in model railways, in tracing routes of old canals and railways and has, he says, "even written a paper on bus routes which have disappeared - a less tangible pursuit."

The Society welcomes Mr. Klapper as Chairman, where his wide experience and commonsense approach to matters will be invaluable.

NEW LIGHT ON I. K. BRUNEL

(continued from p. 45)

(From an address by Mr. L. T. C. Rolt to the Society, in London, on 23 February 1957. Copyright reserved).

The Committee's idea was that whoever should survey the cheapest line between London and Bristol would get the job as engineer to the Company. Brunel refused to accept the work on such terms. He made it clear that he would survey only one road - not the cheapest but the best; he very nearly lost the job as a result. He got his appointment by one vote, even the Chairman voting against him. When Roch told him about this afterwards Brunel noted in his diary that "this was going too close - must be more active next time."

Another contestant for the post was W. H. Townsend, surveyor and engineer of the Bristol & Gloucestershire Railway. He was appointed to assist Brunel, who obviously took a dim view of his capabilities. After his first interview with Townsend he wrote: "How the devil I am to get on with him tied to my neck I know not." However, they began their survey work together on the morning of Saturday, 9 March 1833, when they rode out of Bristol along the line of the B. & G.R., and thence to Wick Court, over the hills into the Lanbridge Valley and so down to the London Road just west of Bath. The idea (most probably Townsend's) was that the line should take this route and so use the B. & G.R.'s road bed for the last few miles into Bristol, but Brunel very quickly killed this notion and had decided on the line down the Avon valley to a terminus on Temple Meads before the first day was over.

The subsequent story of the survey and construction of the railway from London to Bristol is a familiar one which has been very ably told by MacDermot, so I do not propose to go into it here. Brunel's diary entries during the survey period throw a new and intimate light on his activities at this time, but from an historical engineering standpoint they do not add materially to our knowledge. Instead, I want to say something about Brunel's unusual design of permanent way, and the reasons which led him to adopt it. In what I have called his Engineering Commonplace book there are some interesting notes on the state of the Hetton Colliery Railway permanent way furnished by some unknown contributor. These state that whereas the original cast iron rails had a life of from ten to twelve years, the malleable iron rails laid by the manager, Luke Dunn, on the section between Hunter's Lane Engine House and the fourth incline in November 1831, had a life of only four years. The trouble, say these notes, was due to "laminations and partings" which kept a blacksmith fully occupied.

These partings would be due to the formation of scale during the rolling process, thus causing the rails to split under the weight of traffic. The heavier the solid section of rail to be rolled the greater the risk of scaling. Hence this trouble would be likely to occur most acutely in the case of a bull head type of rail intermittently supported by chairs. This, I am sure, was the reason which led Brunel to adopt his bridge rail where strength was derived from its arch section without any great thickness of solid metal, and to give this rail continuous support on longitudinal timber baulks.

Brunel's own notes reveal some other considerations. He rejected stone blocks or cross sleepers because he considered that they would be subject to unequal settlement under traffic, with the consequence that levels could only be maintained by frequent tamping of the ballast under them. His aim to obviate this was the second important reason for his permanent way design. He believed that once ballast had been firmly tamped under his longitudinals, his rails thereafter would hold their level with a minimum of attention. It was the object of his controversial piling to hold the framework of longitudinals and cross "transoms" in such a manner that it would not be lifted out of truth by the hard packing of the ballast under it. In his notes he stipulates that piles should not be driven initially on embankments where the formation was subject to settlement, and that in cuttings the piles should be driven at an angle towards the cesses the better to resist thrust from the cutting sides which might cause the formation to lift. It was most unfortunate that while much of the line between Paddington and Maidenhead was being laid, Brunel was absent as a result of his accident on the Great Western steamship, and it was done without his supervision. The packing was not properly carried out, and consequently the longitudinals sagged between the piles with horrid results.

It was then that Brunel decided to drop the piling and to use instead heavier longitudinals and a heavier section rail. The line from Paddington to Maidenhead had been laid with rail weighing 43 lbs. per yard. According to MacDermot, the new 62 lb. rail which was to become standard was first laid west of Maidenhead, while the old light rail remained east of this point until 1843, when it was replaced by 75 lb. rail. If in the meantime the 62 lb. rail had proved perfectly satisfactory elsewhere, it is puzzling to know why this should have been done. In fact, Brunel's letters to Saunders in 1839 tell a different story. In February, he says that the work of relaying the line is proceeding well without interrupting trains, and in May he writes to say he is considering using a rail from six to nine pounds lighter on the new line west of Maidenhead. This is a much more logical sequence of events than that suggested by MacDermot. From the figures given in this

correspondence, it does not appear that the Paddington-Maidenhead length was relaid with rails as heavy as 75 lbs., but that it was relaid there can be no doubt at all. The run of Firefly with the Directors' Special from Twyford to Paddington on 17 March 1840, when she covered the 30 $\frac{1}{2}$  miles in 37 minutes, start to stop, would have been perilous, if not downright impossible, on the old line without the piling.

Another thing which emerges from Brunel's letters to Saunders is that a lot of the blame for bad riding which the permanent way received was really due to defective rolling stock. Brunel refers to "the dreadful thumping of the wheels," and "the dreadful side motion." He eventually discovered that the passenger coaches had tyres of irregular thickness which accounted for the thumping, and that there was half an inch or more of end float in the axle boxes, due to the brasses being shorter than the journals. No wonder, as he said, that the carriages shook themselves to pieces. The reason why this state of affairs was not discovered at once is curious. By an odd survival of stage coach tradition, rolling stock maintenance was left to coach-builders in the Traffic Department, and the responsibility of the engineers was confined to vetting the new mechanical horses. But as a result of Brunel's shocking discoveries, responsibility for carriage and wagon building and maintenance was at once transferred to the Engineering Department.

John Hawkshaw contemptuously dismissed Brunel's broad gauge road as an attempt to do in a difficult and expensive manner what might be done at least as well in a simple and more economical way. This criticism has stuck, but I hope what I have said will have shown that, whatever its defects, Brunel's road was the product of much more hard and shrewd thinking than his rivals gave him credit for. Hawkshaw's remarks were welcome ammunition for Brunel's enemies, who were always charging him with wilful extravagance and they were not justified by the facts. The "baulk road" was certainly more costly to lay. But against this the saving in iron by the use of a lighter rail was very considerable. Wolfe Barry calculated in his Railway Appliances (1876), that Brunel's 62 lb. bridge rail was the equivalent of 75 to 85 lb. rail on cross sleepers; also that on the 7-foot gauge the amount of timber used was less than would have been the case if cross sleepers had been laid. Finally, the maintenance cost per mile was slightly lower. For the half year ending 31 December 1868, the cost per mile figures were: broad gauge baulk road, £165.16. 4d; narrow gauge cross sleepered, £176. 1. 1d. For the mixed gauge the figure soared to £251.18. 5d., - but that is another story.

The effect of the bitter attacks made against Brunel by what was called the "Liverpool Party" among the Great Western shareholders has been very long lived, and echoes of it survive in popular estimates of Brunel's work to this day. The purpose of these attacks, which aimed to discredit him as an engineer and drive him out of office, has not been appreciated for the reason that the two sides of Brunel's astonishing career are usually treated in isolation. It would not be appropriate here to consider that other marine engineering side, but this one fact should be remembered. At the time these bitter attacks were launched, ostensibly against the broad gauge and the baulk road, Brunel's steamship Great Western was causing the city fathers and merchants of Liverpool great alarm, by seriously threatening their city's recently won supremacy as an Atlantic port.

In the railway sphere alone, Brunel's was a life of prodigious achievement and - in the case of the atmospheric railway experiment - disastrous failure. To review it adequately in this short paper would be quite impossible, and is not my intention. My object has simply been to mention a few of the new points which have emerged in the course of my research. In conclusion I will mention one more which concerns Brunel's timber viaducts. To save first cost by building large structures in a short-lived material has sometimes been dismissed as a penny wise and pound foolish policy, but this criticism ignores the changes which have taken place since Brunel's day. All the viaducts were built of Baltic yellow pine shipped from Memel. These Baltic pine spars had an average life under traffic of thirty years, and some lasted as long as sixty years. Brunel designed the viaducts in a standardized form, and in such a way that any timber could be replaced without the need for total occupation of the line. With such an expectation of life from the timbers the viaducts were therefore an excellent proposition. After 1914, however, the only suitable timber available - and that at a high price - was Oregon pine, whose average life in service was only eight years. This, of course, made the upkeep of the viaducts totally uneconomic; otherwise we might still see examples of Brunel's timberwork in use on the branch lines of Devon and Cornwall.

In 1844, Brunel wrote this to his friend Adolph d'Eichthal: "Here the whole world is railway mad. I am really sick of hearing proposals made. I wish it were at an end. I prefer engineering very much to projecting, of which I keep as clear as I can .... The dreadful scramble in which I am obliged to get through my business is by no means a good sample of the way in which work ought to be done ..... I wish I could suggest a plan that would greatly diminish the number of projects; it would suit my interests and those of my clients perfectly if all railways were stopped for several years to come."

This reaction of Brunel's to the Railway Mania undoubtedly explains why, in his later years, his interest turned to an increasing extent toward marine engineering. It is obvious that in the problems of ocean steam navigation he found far freer scope for his extraordinary powers than in the English railway world of the late 'forties and 'fifties. Officially, of course, his railway business was enormous still, but it is quite clear from his own writings and from the evidence of his sketch books, that the only latter day railway works which fully engaged his personal interest in the old passionate way that the London to Bristol line had done were the new station at Paddington, and the bridges at Chepstow and Saltash. The Royal Albert Bridge at Saltash was Brunel's swan-song as a railway engineer. He superintended the floating of the first great truss in September 1857 but, owing to his illness, his chief assistant, Brereton, took charge of the rest of the work. He only just lived long enough to see the bridge completed.

(Concluded)

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### THE ROMFORD CANAL

By F. G. M. Watson

The Romford Canal, which was only partially built and never used, obtained its Act in 1875, but prior to this there had been two proposals to build a canal from Romford to the River Thames.

In 1812, a Mr. Charles Sturry of Romford intimated that he intended to "obtain an Act for making a Navigable Cut from the Thames to this place (i.e. Romford) which is generally considered will be most advantageous to the Town and the surrounding country," but nothing came of his intentions.

In 1818, proposals were made for a canal from Colliers Row to the Thames via Dagenham, with short branches to Romford and Whalebone Bar, but this too was never carried out. However, on 19 July 1875, powers were obtained (38-9 Vic. cap. clv.) "for making a Canal and Collateral Cut in the County of Essex to be called the Romford Canal." The authorized capital was £20,000, with power to borrow a further £19,000 if required. The work was to be completed within five years, and power to acquire land compulsorily was for a period of three years from the passing of the Act.

According to the deposited plans the canal, which was four miles five furlongs in length, was to commence at a point to the west of Romford station, and between the Great Eastern main line

and the Romford Brewery. After crossing the railway the canal proceeded roughly parallel to, and to the west of, the rivers Rom and Beam, passed to the east of Dagenham village and entered the Thames between Dagenham Breach and the river Beam, through what is now part of the Ford Motor Company's factory. There were to be six locks, including the entrance lock to the Thames, all falling from Romford.

A second Act (39-40 Vic. cap. clxxxii) was obtained on 24 July 1876, which gave the company power to raise a further £16,000 and increased their borrowing powers. A third and final Act (43-4 Vic. cap. cvii) was obtained on 2 August 1880. This Act extended the time for the completion of the works to three years from 19 July 1880, and revived the power to acquire land compulsorily for a period of two years from the date of the passing of the Act.

The only portion of the canal which was ever built was the section from the Thames to a point just north of Dagenham Beam bridge on the old Rainham - Dagenham road, a distance of approximately two miles, and this appears to have been completed by the end of 1876. The plans of the entrance lock to the Thames were approved by the Thames Conservators on 28 June 1875, but the work of cutting the canal bed started behind the river bank, and physical connexion with the river was never made.

The section of the canal from the Thames to the main London - Tilbury - Southend road (A.13) has recently been filled in in connexion with the formation of the new access road to the Ford factory, and the factory has been extended over the site of the old entrance lock. From the A.13 road to Dagenham Beam bridge, however, the bed of the canal is clearly visible, and a filled in lock can be seen immediately adjoining the main road on the north.

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### THE GRIFF COLLIERY CANAL

By H. J. Compton

In the county of Warwickshire, about six miles from Coventry, is the colliery called Griff, which in the 18th century was owned by Sir Roger Newdigate who, as a principal shareholder, served on the committees of the Coventry and Oxford canals. He, like many other men of forethought, saw that the canals would provide an improved means of transport for coal as compared with that of the packhorse.

On 30 October 1770, he asked the Coventry committee if they were willing to cut a short canal from their navigation to his pit. This was refused, no doubt due to the fact that they were

still building their own canal, which was proving more expensive than had been anticipated.

He approached the committee again on 20 March 1786, and this time they agreed with his suggestion that he should build the canal himself. It is apparent that he soon put the work in hand, as we read in the minutes of the Coventry Canal for 4 April of the following year that the canal was to be "Stopped" and the water let off, to enable the junction to be effected.

In the latter half of the 19th century considerable interest arose in the revival of canals, which culminated in the setting up of a Royal Commission in 1905. This, perhaps, has a bearing on the fact that in the following year the owner of the colliery, wishing to clean out his canal, approached the Oxford committee for the loan of a dredger and two boats. This was done, and resulted in narrow-boats drawing 3' 6" loaded with 32 tons of coal being able to navigate the canal.

The canal commences by Griff Junction on the main line of the Coventry Canal, about two and a half miles south of Nuneaton. It goes off in a westerly direction for a distance of only six furlongs along what surely must be one of the most interesting and picturesque routes. It is so narrow that in only a few places can boats pass each other.

The entrance to the canal is about five miles up the "Bottom Road", round a sharp left-hand bend under the tow-path bridge. Half-way along the canal is a basin and wharf where stone from Griff Quarry was loaded into their own boats. Following this is the bridge hole which suffered badly from a mining subsidence, and it was necessary during the last war for empty narrow-boats, before passing, to remove the "cratches", etc., on both the Motor and Butty boats. Beyond is Griff Colliery wharf, where coal is tipped into the boats from wagons which traverse the colliery tramway. There are no locks on this canal. Coal loaded at its wharf does on occasion travel a great distance, for example, to Alperton on the Paddington arm of the Grand Junction Canal.

This is one of the few canals in the Midlands that is not under the control of British Transport Waterways, but is, in fact, owned by the National Coal Board.

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### BOOK REVIEW

"THE NON-TIDAL WYE AND ITS NAVIGATION," by I. Cohen, M.I.Mech.E. 19 pp., map and bibliography. (Included in the Transactions of the Woolhope Club, Vol. XXXV - Part II, 1956). Mr. Cohen's article can be obtained separately from F. C. Morgan, Esq., Secretary, The Woolhope Club, 267 Ledbury Road, Hereford. Price 2/9d post free.

Hereford has been served by many kinds of transport: first by the river Wye, then by the Hereford tramroad, then by the Herefordshire and Gloucestershire Canal, then by railways, and of course by roads as well. The non-tidal Wye is one of those rivers which has virtually always been navigable, and it continued so until about 1860, when railway competition finally killed the barge traffic to Hereford. In its long life it survived many attempts at improvement, and never had pound-locks, though for a time a few flash-locks were in existence. The only sustained addition to the natural river was the construction by a company formed for the purpose of a horse towing-path from Hereford to Lydbrook under an Act of 1809. This was finished in 1811, and proved profitable for a number of years.

No previous account of the Wye navigation has been written. We are in Mr. Cohen's debt, for he has perseveringly collected together a great deal of miscellaneous material on the history of the navigation and the river which has not been accessible before. That it is not yet enough to enable a connected history of the trading history of the Wye to be written is no criticism of Mr. Cohen, as anyone knows who has laboured to add fact to fact when each has to be found from a different source.

We may hope that one day Mr. Cohen may find the records both of the shadowy trustees who existed from the passing of the Act of 1695 to about 1790, and also of the towing-path company. Until then, we must be grateful to him for a great advance upon our previous knowledge of an important navigation.

C. H.

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### NOTES ON PUBLICATIONS

"THE MOTOR," 17 April 1957. (The Peak Forest Tramway).

Messrs. Ferodo Ltd., manufacturers of brake linings for motor vehicles, have acquired a section of the track of the Peak Forest Tramway. A stretch of some 700 yards long near Milton Chapel, straddled by the Chinley triangle railway viaducts, has recently been rebuilt as a road for special private testing purposes by the technical division of Ferodo.

The Peak Forest Tramway was built in 1797, and ran for about six miles from the Buxworth basin of the Peak Forest Canal, authorized in 1794, to quarries at Doveholes, near Buxton. Its route was roughly parallel to Black Brook. In its early days the line carried much limestone to make mortar for the building of the new mills then going up in Lancashire. It is recalled that trains of up to thirty 2-ton wagons ran much of the way down to Buxworth by gravity, being hauled back to Doveholes by horses. The tramway went out of use about 35 years ago, and a section of rail and a wagon are preserved at the York Railway Museum.

Further details and photographs of the new use to which the old tramway is being put may be found in The Motor for 17 April 1957, page 370.

M. I. B.

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"THE RAILWAY STATION: an architectural history," by Carroll L. V. Meeks. 203 pp., frontispiece, 5 diagrams, 231 plates. Published by the Architectural Press, 9-13 Queen Anne's Gate, London, S.W.1. Price 60/-.

The literature of this subject is by no means extensive. So far, in actual book form, we have only had Mr. Christian Berman's Introduction to Railway Architecture and Professor Henry-Russell Hitchcock's Early Victorian Architecture in Britain. Mr. Meeks has now produced a work of considerable scholarship on the history of railway station architecture in Europe and America, taking as his text a quotation from The Building News of 1875. This reads: "Railway termini and hotels are to the 19th century what monasteries and cathedrals were to the 15th century. They are truly the only real representative building we possess ..... Our metropolitan termini have been leaders of the art spirit of our time." He attempts, fairly successfully, to follow a chronological pattern in his studies of stations, and the scope of the survey is demonstrated by the chapter headings: 1. The 19th century style: Picturesque Eclecticism (with which phrase Mr. Meeks makes great play); 2. Functional Pioneering (1830-45); 3. Standardization (the 1850s); 4. The Middle Phase: Sophistication (1860-90); 5. The Third Phase: Megalomania (1890-1914); 6. The 20th century style (1914-56).

Two themes are fundamental to the work: the aesthetic of the picturesque and the possibilities inherent in metal construction. The author reminds us that there was no functional precedent for the railway station; every solution to every problem had to be invented. He very properly remarks that the wonder is not that the stations were sometimes awkward and inconvenient, but that they were in many respects efficient and audaciously successful. The

station was an essential part of the new system of transportation; it reflected the impact of the technology and mobility of the masses. It played its part in the opening up of the frontier, it is associated with conurbation, the spread of the suburbs, the development of resorts. Diagram A, "Early types of Station Plan" (e.g. Head type with Shed: Brighton, 1841; Two-sided with Shed: Liverpool, Lime Street, 1836) is useful, as are the later comparisons of American, Continental and British stations.

The illustrations proper, gathered at the end of the book, form a rich collection, many being reproduced from engineers' and architects' drawings and contemporary engravings. They range from a delicate print of Liverpool Crown Street (1831) and Francis Thompson's Derby Trijunct (1839-41) to the new Rome Terminus of 1951, including on the way a glorious castellated affair at Salem, Mass., on the Boston & Maine Railroad (1847) now demolished, and a splendid double-page spread of Barlow and Ordish's triumphant train shed at St. Pancras (1863-76). An appendix gives a comparative table of spans, maximum heights, lengths and truss-types, and there is a bibliographical essay.

Considering the author's remoteness from England, and the great wealth of minute detail he would appear to have been remarkably accurate. Purists, however, may like to note that John Nash's Cronkhill (p. 43) is not in the Isle of Wight, but a few miles south-east of Shrewsbury, and that Exeter St. Thomas, G.W.R. (Plate 26) is in Devonshire, not Derbyshire. The curious may like to decide which was the first station to include a cinema. It might be New York Second Grand Central (1903-14) or Copenhagen Central (1906-11), or is there an earlier one?

M. I. B.

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#### CORRESPONDENCE

Sir, - I would like to enlarge on a point raised by Mr. Holt in his article "A Collision in Fog" in the May Journal. It might appear from the article that the "empty" carriage behind the tender of the up train - "stuffed with luggage and acting as a dummy" - was a fortunate coincidence. In fact it appears to have been the regular practice on this (the Midland Counties) and other lines, as witness the following extract from the Derby Mercury of 15 February 1843:

"Midland Counties Railway. We observe with pleasure that the plan of placing an empty carriage next the tender is generally adopted on this line."

P. STEVENSON.

## FIELD WORK

By E. A. Wilson

Obtaining documentary evidence can be a laborious, time-consuming occupation, as many members will know quite well, especially if they have had a spell of working through old newspapers.

Field work, on the other hand, is often physically tiring, but has many compensations, and should appeal to our younger members. Often it takes us out into delightful country, and provides ample opportunities to budding amateur detectives to develop their critical faculties.

The following account of a recent outing carried out by my son and myself illustrates these points. Perhaps I am luckier than most members in having access to large scale Ordnance Survey maps (25" to the mile scale), surveyed as long ago as 1875, which are kept at the local canal depot. Many of the features shown have partially or completely disappeared, and but for the map would be difficult to trace.

Our objective on this occasion was a part of the "Welsh Canal" between Llangollen and the Horseshoe Falls called Pentre'r-felin. There is much of interest here, and the old maps showed a tramway coming from the north to the "Pentre'r-felin Slab and Slate Works" which I had not noticed before, so one of our aims was to trace this back to the slate quarries if at all possible.

The Eglwyseg River flows through an arch in the old tramway embankment, then flows under the road bridge, and immediately under the Pentre'r-felin aqueduct, which carries the canal over the river at a somewhat higher level than the road. Actually, the word river is rather a misnomer, as it is quite a narrow stream, so that the canal aqueduct is barely more than an outsize culvert, its measurements being 12' 6" high and 15' wide.

We found a great deal of activity going on. The 1875 map showed some buildings just by the canal bridge labelled the Pentre'r-felin Slab and Slate Works. These were derelict when I visited the neighbourhood some years ago, but today they echoed to the noise of machinery, a noise which competed with the more natural and pleasing music of the River Dee as it broke over the shelving rocks and the remains of a former weir nearby. The old map showed this weir in being, with a salmon leap at its central point; today, all that remains are the well-built abutments and a portion of the weir on the near side. The works are now concerned with the grinding and grading of silica, a product not found in the neighbourhood but brought here to be processed.

One line of a railway siding came to the works, and I walked back along this. Sidings, consisting of four tracks, led from here, gradually converging to join the single track of the Vale of Llangollen line. Coming back again, this railway veered to the left, ascending an embankment, and then crossed the River Dee within sight of the silica works on a substantial iron girder bridge supported on stout iron columns - not at all picturesque although, no doubt, efficiently designed for its particular purpose.

Returning to the works, I learned that the portion of the canal from the bridge here as far as the Chain Bridge was the scene of an interesting experiment. By Act of Parliament, only a certain volume of water is allowed to enter the canal each day, and an appreciable amount is always being lost by leakage. This leakage had always been a source of continual trouble even in the early days of the canal's existence, and a constant expense to the canal company. Now that the water is being conveyed by the canal to Hurleston Reservoir for sale to the Mid & South East Cheshire Water Board, this water becomes a matter of some importance to the British Transport Commission who now own the canal.

Attempts to prevent the leakage are now in progress, and two methods are being tried out by different firms to determine the most efficient way of dealing with the problem. The dried out stretch of the canal has been completely cleared out, and hundreds of tons of stone chippings have been emptied on to the steeply sloping sides and bed of the canal. It was a strange sight to see a tractor pulling a heavy roller to consolidate this material on the canal bottom! One firm is going to cover this bedding with asphalt; another is going to incorporate bituminous material with the clay and soil - a process that does not really need the stone chipping ballast - and then cover it with a bituminous membrane. All these methods are in the nature of original pioneering, so that it will be interesting to learn which proves the most successful.

The old maps showed a tramway coming to the Slab and Slate Works from the north, but as the maps kept at the Ellesmere depot were only those sheets featuring the canal, the length of tramway shown was but a mile. However, on inspecting present day smaller scale maps I saw that the northerly course of the tramway, if continued, would lead it to the mountains, where I saw the name Oernant. I then saw the solution to a problem which I had met with some years ago; in the 1805 report issued when the canal was virtually completed, the uses of the canal included "to carry coal to the Trevor Lime Rocks, and for the consumption of the country in the Vale of the Dee above Llangollen; also to bring down Irenant Slate, &c." In another part of the same report it is

stated that the canal will be used to convey "coal and lime for consumption of all the upper part of the valley of the Dee, which is extensive and populous; and as the Irenant Slate will be returned as back carriage, etc." Obviously Oernant and Irenant are synonymous, and the tramway had been constructed to bring the slate from these quarries to the Slab and Slate Works alongside the canal.

The problem was to find out what remained of the course of the old tramway. The map showed it crossing the canal and the adjacent road at practically the same level. The location of this cross-over was clearly seen by the well-preserved remains of the stone abutments which must have supported a light bridge at one time - possibly a small lift-up type. On the far side of the road, a gateway marked the place where the tramway ascended a short way along what is now a drive leading to a bungalow. A few yards further along there was low-lying ground, and the former tramway had crossed this on a substantial and well-constructed embankment, 105 yards long and 30 feet high, where the Eglwyseg River passed through a high, central archway faced with stone blocks; two smaller archways penetrated the bank on either side of this central opening. Shrubs had been planted on the embankment and the grass cut short, so that it was quite a decorative feature when viewed from the road bridge, less than a hundred yards distant. The embankment is now privately owned.

A small stream was culverted under the extreme left of the embankment, and as the ground was much higher here, it was flowing at a higher level than the Eglwyseg River. Reference to the old map showed that it was, in fact, a mill-stream which left the Eglwyseg River nearly a quarter of a mile back and, after passing under the road, led to the back of the Pentre'r-felin Corn Mill. From enquiries made on the spot, I learned that the undershot water wheel was removed about five years ago; two old mill stones still stand propped up against the building by the roadside. The mill-stream then passes under the canal through a three foot wide culvert, and enters the River Dee at the same point as the Eglwyseg River.

When we set out again, we soon reached the point where our large-scale map ended, and we had only the general direction to guide us. Our last mapped portion showed the tramway leaving the road and inclining north west by the Maes-y-llyn cottages. It was not long, however, before we struck an embankment crossing a field, and then altering direction to make a bee-line for a mountain which barred its path. As there were no quarries at the bottom of the mountain, there seemed to be no alternative to their being out of sight beyond the top, and that the slate must have travelled along an incline down the mountainside.

But what an incline! It looked impossible for any trucks to have travelled down it, as the vertical distance shown by the map contours was nearly 900 feet, while the gradient was almost 1 in 1 in places. It also looked an impossible route to climb as it was derelict, overgrown with gorse bushes, dead bracken, loose slate and other debris. But having come so far, we did not like to admit defeat, so we decided to climb the slope. It was so steep that we could rarely stand upright, and did most of the ascent in a kind of "monkey crawl", even resorting to hands and knees on occasions, and having to rest every thirty feet or so to cool down and regain our breath.

All the time we kept a lookout for any signs which might give us a clue to the way the incline was worked. Our first discovery was a pair of rectangular hollows, with two slates placed vertically forming the sides, and one slate - also vertical - closing the upper end. The width of the hollow was 7", and the two hollows were 5' 6" apart. Before we reached the end of our climb we found twenty of these, and no doubt more were covered over by plant growth. Nowhere did we find any traces of rails, and I became more convinced than ever that the slope was too steep for their use.

About 400 feet up we reached a well-built slate-faced embankment on each side of the incline, and a wide level path going left and right. There were some large, roughly rectangular, slates here, about two feet square, which had four heart-shaped holes punched through near to their centres. On the way up we had found broken fragments of slates with similar holes punched through them.

Shortly afterwards we made two discoveries which answered one of our questions: in one of the slate-line hollows we found a stout iron pulley wheel intact; and a considerable length of wire hawser, doubly six-stranded, with a cross section of  $1\frac{1}{2}$ ". Obviously there had been a double line of these pulleys along the course of the incline to act as guides for the wire hawsers. Another find was an iron spike going through a piece of slate; and at one place four 2'-square slates placed flat on the ground about three feet apart. We thought the incline might have been surfaced with these large slates spiked into position (the spiking holes were 8" from one edge), and that the hawsers might have been attached to some form of sledge which was loaded up with slates and lowered down the incline.

At the bottom of the incline there was a derelict slate building which might have acted as a stable for horses, or a siding for trucks, which would then have taken the slates along the tramway to the works by the canal.

Eventually we reached more derelict slate constructions at the head of the incline, and a small slate quarry, although far too small to justify the expense involved in making an incline. We had now crawled up some 800 feet from our starting point and, although the incline had ended, there was still a further rise to the summit.

We should have liked to continue our investigations, and to have located the main slate quarries which were in operation before 1805, but time had beaten us. While the outing had been most fruitful and enjoyable, there were still questions unanswered, and fresh ones posed - but then that is as it should be.

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### RECENT LITERATURE

#### William J. Skillern

- |                                |                                                                                                                                                                                                                             |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BARRIE, D. S. M.               | The Brecon & Merthyr Railway. 1957. (Oakwood Press, 9/-, 11/6.)                                                                                                                                                             |
| COZENS, Lewis.                 | Aberayron transport. [1957]. (L. Cozens, 25 Cholmeley Crescent, London, N.6., 10/-)                                                                                                                                         |
| LONDON TRANSPORT<br>EXECUTIVE. | London travel survey, 1954. 1956. (London Transport Executive, 5/-)                                                                                                                                                         |
| NORRIE, Charles<br>Matthew.    | Bridging the years: a short history of British civil engineering. 1956. (Edward Arnold, 21/-)                                                                                                                               |
| RAILWAY CLEARING<br>HOUSE.     | Official handbook of stations, including junctions, sidings, collieries, works, etc. on the railways in Great Britain and Ireland, 1956. [1957]. (Railway Clearing House (B.T.C.) 203 Eversholt Street, London, N.W.1 25/-) |
| WALLIS, P. Ransome.            | The World's smallest public railway: the Romney, Hythe & Dymchurch. [1957]. (Ian Allan, 2/6)                                                                                                                                |

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The following book is not recent, but is included here because, although it deals with a single railway, it was omitted from the lists of individual histories which appeared in the Library World for December 1942 and March 1955. I am indebted to Mr. G. Harrop for drawing my attention to it, and for the loan of his copy.

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|-------------------|-----------------------------------------------------------------------------------------------|
| VEITCH, George S. | The Struggle for the Liverpool and Manchester Railway, 1930. (Daily Post Printers, Liverpool) |
|-------------------|-----------------------------------------------------------------------------------------------|



ONE HUNDRED YEARS AGOJune-July, 1857

Illustrated London News, 13 June. "RIGHTS OF RAILWAY TRAVELLERS. - A decision of considerable interest to the travelling community has been given at the Bloomsbury County Court. Mr. William Finlayson Hunter, a commercial traveller, summonsed the London & North-Western Railway Company to the above court for 18s., being the excess fare he had to pay to travel between London and Auchinleck, having been refused a third-class ticket by the booking-clerk, although the time-tables of the company expressly state 'that third-class passengers will be booked to all stations south of Glasgow on the Caledonian and Glasgow and South-Western lines, by the train leaving Euston-square station at 8 p.m.' Judgment was given to plaintiff for the amount claimed."

Illustrated London News, 27 June. "The South-Western Railway Company have arranged to carry passengers between the Nine Elms and Waterloo stations at eight in the morning and at half-past eight in the evening for one penny. This is designed with the special object of accommodating the large body of artisans employed on the London side; thus affording the opportunity of escaping the crowded streets, to the enjoyment of purer air and cheap rents."

Railway Times, 4 July. "Shropshire Union: A Wharnccliffe meeting was held on the 26th ult. at Shrewsbury to consider two bills before Parliament, one for the conversion of part of the Shropshire Canal into a railway, and the other for the making of a line from Caersws (near Newtown) to Machynlleth; Mr. H. Tootal in the Chair. - The Chairman stated that the canal was about eight miles in length, and passed through the Shropshire iron district. It was in a bad state of repair, and badly supplied with water. It would cost about £30,000 to put the canal into repair, and the estimated cost of converting it into a railway was £80,000. The London & North-Western would pay the cost of the conversion and of obtaining the Act of Parliament, and the Shropshire Union shareholders would not be called upon to pay anything. The Newtown and Machynlleth bill merely provided for working arrangements between the two companies. - Resolutions approving the two bills were unanimously passed."

Herapath's Journal, 27 June. "West-end Terminus: it is said the Crystal Palace Railway Company have purchased, or agreed to purchase, the Grosvenor canal, with a view to forming a railway along its banks, and using its Grosvenor basin, within half a mile of Buckingham Palace, as a grand West-end terminus railway station."

Herapath's Journal, 27 June. "A New Richmond Railway: the Kew line is to be extended to Richmond. This will afford the people of St. John's Wood, Hampstead, Highgate, Camden Town, and all along the North London line, a railway to Richmond, but we do not apprehend it will take a passenger away from the South-Western's line, which runs from Waterloo station to Richmond. It cannot be classed as a competing line."

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### UNIVERSITY COURSES

#### Birmingham.

A residential course on canal and railway history is to be held at the Preston Montford Field Studies Council Centre, near Shrewsbury, from 13 to 20 July. The course is designed to give students an insight into the study of the early history of Civil Engineering in this country. The main emphasis will be laid on Telford's work in the area, including bridges, canals, aqueducts and main roads. A visit will also be made to the Shropshire & Montgomeryshire Light Railway. Tutors will include Messrs. L. T. C. Rolt, C. R. Clinker, Charles Hadfield and Michael Rix. The fee for the course will be £8. 8. 0. Enquiries should be made to the Director of Extra-Mural Studies, The University, Edmund Street, Birmingham 3.

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### NEWS FROM THE SOCIETY

#### HON. SECRETARY'S NOTES

##### New Members

|                  |                                                                         |
|------------------|-------------------------------------------------------------------------|
| HOUGHTON, P. D.  | 31, Colenso Road, Blackburn, Lancs.                                     |
| JACQUES, P.      | 14, Dolman Road, Aston Manor, Birmingham, 6.                            |
| KAUFMAN, W. M.   | 1065, University Avenue, Apt. 11E, High Bridge,<br>52, New York, U.S.A. |
| MYERS, C. L.     | 483, New Hey Road, Huddersfield, Yorks.                                 |
| NORRIS, J. E.    | 2, Prince's Avenue, London, N.10.                                       |
| RAMSON, P. J.    | 55, Cumberland Mansions, Seymour Place, London, W.1.                    |
| RICHARDSON, A.   | 119, Easterly Road, Leeds, 8.                                           |
| ROSE, D. P.      | 3, Portland Road, Gravesend, Kent.                                      |
| TALBOT-SMITH, M. | Kedron, Owlett's End, Evesham, Worcs.                                   |
| TAYLOR, R.       | Romney, Halter Path, Hamworthy, Poole, Dorset.                          |
| WALKER, T. E. C. | Spring Grove, Water Lane, Cobham, Surrey.                               |
| WILLIAMS, J. H.  | 26, Grove Gardens, Teddington, Middlesex.                               |

##### Change of Address.

|                 |                                                   |
|-----------------|---------------------------------------------------|
| CARNETT, D.     | The Vicarage, Fairbairn, near Knottingley, Yorks. |
| KNOWLSON, P. M. | 16, Sion Hill, Clifton, Bristol.                  |

## Chairman of the Council

At their meeting on 25 May, the Council unanimously elected Mr. Charles F. Klapper as Chairman, and Mr. Charles Hadfield as Deputy Chairman for the coming year. The Council also placed on record its appreciation of the services of Mr. M. D. Greville, the retiring Chairman, and wished him a speedy recovery to good health.

## REPORTS ON EVENTS.

London, 13 & 14 April. An interesting tour of the North London Railway was made on 13 April, ably led by Mr. H. V. Borley, who gave a talk on the history of the line the same evening. The following day, over 40 members and their friends enjoyed a trip on the Regent's Canal from Paddington to Bethnal Green, under the expert guidance of Mr. Charles Hadfield.

York, A.G.M., 4 & 5 May. This was an enjoyable weekend, favoured by reasonably good, if cold, weather. Unfortunately, several members who had arranged to attend were prevented from doing so by illness and other reasons, and the attendance was smaller than had been hoped for. The first day was spent in visiting the Railway Museum, and a trip down the Ouse to Naburn Lock to celebrate the 300th anniversary of the first Act for the River Ouse Navigation. On the second day, there was a coach tour, enabling members to visit various places of canal and railway interest.

The President, Officers and all Council Members were re-elected at the Annual General Meeting on 4 May, and the Secretary's Annual Report and Balance Sheet were approved. The revisions to the Constitution and Rules, as set forth in the agenda circulated before the meeting, were also unanimously adopted, and a reprint of the Rules will be sent to each member with the September Journal.

East Midlands, 31 May. Mr. H. W. Parris gave an interesting talk at Nottingham on "The Railway Department of the Board of Trade in the 19th Century". It is reported that the attendance was small; this is the more unfortunate in that the lecturers sometimes go to considerable trouble and expense in order to visit local groups, often at some distance from their own homes.

## FORTHCOMING EVENTS

Herefordshire Weekend, 27 & 28 July. Members have already received circulars giving details of the rail tour of the Kington and Presteign branches, and the tour of the Leominster Canal. Those who wish to take part and who have not booked are advised to do so without delay. Details are given in the circular.

London Group, 17 August. Guildford-Godalming tour. A circular will be sent to members in London and the south giving details.

Ulverston & Lancaster Centenary, 31 August. Members should note the change of date. Those interested should send a stamped addressed envelope to the Hon. Secretary for details, which will be released at the end of July.

Durham Weekend, 7 & 8 September. Details will not be ready until the end of July or early August, and interested members should send a stamped addressed envelope to the Hon. Secretary for details in connexion with this weekend.

### PUBLICATIONS RECEIVED

"The Non-Tidal Wye and its Navigation," by I. Cohen, M.I.Mech.E., (reprinted from "Transactions of the Woolhope Naturalists Field Club" (Hereford) Vol. XXV, Part II, 1956) - from the author; "Historic Fires - The Regent's Canal Explosion, London, 1874," (article in "The F.P.A. Journal," April 1957 - from the Fire Offices' Committee, Fire Protection Association; "Northallerton to Hawas: a study in Branch-line History," by H. W. Parris (offprint from "The Journal of Transport History," Vol. II, No. 4, November 1956) - from the Author; "Railway Forum," May 1957 (Official journal of British Railways Eastern Region Staff Railway Society) - from the publishers, on an exchange basis for our own journal, to be received monthly; "A Guide to the Materials for Local History in the Muniment Room of the Dorset County Museum," (reprint from the Proceedings of the Dorset Natural History and Archaeological Society, Vol. 67 - 1945), and "Index to the Dorset County Records," compiled by A. C. Cox, Clerk-in-charge of County Records, May 1938 - both from D. Garnett.

The Society is grateful to the donors of all these publications.

### THE JOURNAL

It is regretted that publication of the Journal has been delayed this month, owing to unavoidable circumstances.

The Officers are aware that delay may sometimes occur in answering members' letters. It is hoped that members will appreciate that, due to holidays or absence from home on business, it is not always possible to deal promptly with Society matters.

Under Members' Interests on p. 60 of the May Journal, mention was made of the Redruth & Chacewater Railway. It is pointed out that the correct title, at the date of the Act, was Redruth & Chasewater Railway.