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THE VICTORIA LINE

At the time of going to press, all that has been published about the opening of the Victoria Line is that the first section will be opened on Sunday 1st September. It has been stated that work has been delayed by the labour dispute and by the serious fire at Tottenham Hale station on Monday 1st July, so that engineers are having to work round the clock to get the line ready. Even so, some of the finishing work at stations will not be complete, nor will all the automatic fare collection gates be installed ready for the opening - but all this work should be completed within a few weeks.

The section being opened as the first stage is from Walthamstow Central to Highbury, with intermediate stations at Blackhorse Road, Tottenham Hale, Seven Sisters and Finsbury Park. On the following Saturday, 7th September, the bus services in north east London will undergo a major reorganisation, largely based on the Victoria Line terminus at Walthamstow Central, where a new bus station is under construction.

No details are yet available regarding an opening ceremony, so members are advised to watch for press announcements; likewise no information has been received about the services to be run on the new line.

A recent announcement has confirmed that a station will be built at Pimlico on the Brixton Extension of the Victoria Line. This will be a big help in a hitherto badly-served area.

THE LONDON BLUE CLAY

J.P.Thomas
F.I.E.E.

(With acknowledgement of help in compilation from V.A.M. Robertson, C.B.E., formerly Chief Engineer, Southern Railway and London Underground Railways)

Seventy-nine route miles (inclusive of the forthcoming Victoria Line) of standard British railway double track resides in the deep level twin 12-ft tunnels built into the strata of London's blue clay - that incredibly tough unyielding bed of tertiary loam, this phenomenal clay of London upon which the capital city is largely built, and this too has fortunately enabled the building of London's Tube Railways in their present form. These strong cast iron segmented tunnels form the 79-mile main artery of the deel level Underground lines, out of which open-air extensions have grown to provide service into the East, West, North and South but not as yet South-East London, which lacks any through service to the central area, urgent though the need is. The route mileage of the Tube Railway open-air extensions stemming from the Tube artery in the blue clay amounts to 88: thus the Tube Railway system enlarges to 167 route miles, or, in other words, 334 miles of single track. If to this is added the mileage of the District and Metropolitan subsurface cut-and-cover tunnels, namely 21 route miles, plus their surface extensions of 83 miles, the route mileage of the whole is 271, or 542 miles of single track. It should be observed that the actual tube railway is of cast iron twin tunnels all the way (except for short portions of concrete in the east) and the District and the Metropolitan subsurface railways in double tunnels of brick.

Upon completion of the Victoria Line the London Underground Railway system will be carrying the vast traffic approaching 900 million passengers per annum, which broadly and numerically is equal to the conveyance

of London's population 75 times per annum, the large proportion of which make their journeys surrounded by the famous blue clay. Little do they realise their good fortune in the standards of amenity of travel that rely so greatly upon this "troglodyte" media, which skilled engineers have turned to so beneficient an account in the public transport services of this Capital city.

The London Tube Railways commenced operation in the year 1890. The tunnelling system has never failed from any cause. The London Transport engineers carry out very exhaustive periodic tests and microscopic examination and great care is taken to see that the tunnel face is adequately supported whilst the tunnel is driven. If during construction there is a sudden change in strata from the normal London blue clay to some less suitable medium, such as running sand or loamy gravel or other inconsistency, then the ground is treated chemically to consolidate it and the tunnelling proceeds under compressed air.

The question has been raised of possible trouble to the Tube tunnels from the weight of modern 30-storey erections. There need be no fear on this score at all as the weight of these buildings is carried on pile foundation and taken down to depths below and away from the Tube, so that no weight directly falls upon it. The foundations of the large buildings now going up in so many places in London, will however, undoubtedly add to the difficulties of Tube engineers in planning new railways so urgently needed to counteract the stagnation of the traffic upon the streets and the roads above. How wise to get on at once in building more Tube lines before the door is closed to needed routes by these obstructions.

There are 120 stations (including the Victoria Line and counting interchange stations as 2, since each has 2 and sometimes 3 stations at the same point) all embedded in the London blue clay. The deepest is the Hampstead Heath station, 180 ft from street to rail, whilst the shallowest is Queensway, 30ft. The radius

from Piccadilly Circus to the furthest of these stations right in the clay varies from 5 miles to 10 miles but the extent of the London clay far exceeds this area.

An estimate of the amount of blue clay removed to receive the cast iron tunnel lining of the London Tubular Railway systems since their introduction in 1890 shows it to be 7,225,500 tons (seven million two hundred and twenty-five thousand five hundred tons). This includes the 12ft diameter running tunnels, the 23ft diameter station platforms tunnels, station passengers, escalator and lift shafts, emergency railway sidings, ventilating shafts and pilot headings.

Until now no estimate seems to have been made of this tonnage and it may not be easy to envisage what this immense figure of excavation really is. It must be remembered that the process dates back to 1890 (78 years). Those far-seeing and determed City & South London Railway engineers - Baker (later Sir Benjamin,) Mott of the famous Tube Railway building Consulting Engineers, and Greathead (whose name needs no emphasis, for it was none other than he that made tube tunnelling in clay the achievement that it is) - were the great men who devised the system of excavating the blue clay in process which has enabled Londoners to travel to and from the City in speed and comfort and is accepted as the principal means of local City transport today.

Strange as it may seem, this blue clay occurs nowhere else in the world, so far as is known, nor is there so convenient a subsurface for deep railway tunnelling.

John P.Thomas
Formerly General Superintendent,
London Buses
General Manager,
Underground Railways
Consultant to
General Post Office
Underground Automatic
Railway

June 1968

THAMES TUNNELS

The continuation of the chapter from the book entitled "Under London; A Chronicle of London's Underground Life-lines and Relics". By F.L.Stevens, the book was published in 1939 byJ.M.Dent and Sons Limited, by whose courtesy it is now reprinted.

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On 27th March 1835 work began again on the Thames Tunnel. A new shield replaced the old one, and for eight more years work went steadily on - in spite of illness arising from fumes from the river-bed (the Thames was still London's main drain), inspite of explosions from the accumulation of foul gases, and in spite of three further inflows from the river.

At last, on 25th March 1843, staircases were built round the shafts, one at Wapping, and one at Rotherhithe. The job was done, and Brunel senior, who had held on despite incredible trials, apprehensions, and disappointments, led a triumphant procession through the tunnel.

The world applauded, rightly, this first great feat of under-river tunnelling. People cheerfully paid their pennies to look at it; Thomas Hood wrote a poem about putting a pipe in Old Thames's mouth, and on the title-page of a specially written "Tunnel Waltz" was an excellent engraving of the tunnel that now carries Underground trains.

It was, in its day, perhaps the most popular item of news in the world. True, some had tried to belittle Brunel and to laugh away any possibility of his final success. They christened the Thames Tunnel the 'Great Bore', and were astonished and grudging when his work was done. They were few, however, and his well-wishers were legion. I doubt if any man in history ever bore a responsibility of such magnitude with greater courage. In temperament Brunel possessed the sensibilities of an artist as well as the patience of a man of science. The long waiting and the fearful anticipations that beset him when, to collect a little income, the uncompleted tunnel was turned into a show place, must have been at times agonizing. Indeed, he did not escape the physical effects of the prolonged

nervous stress. In November 1842 he was out of action for a few months following a stroke.

A few days before the opening of the tunnel, the annual general meeting of the company was held, and the following resolution was passed: "That the cordial thanks and congratulations of this assembly are hereby tendered to Sir Isambard Brunel, F.R.S., for the distinguished talent, energy, and perseverence evinced by him in the design, construction, and completion of the Thames Tunnel, a work unprecedented in the annals of science and ingenuity, and exhibiting a triumph of genius over physical difficulties declared by some of the most enlightened men of the time to be insurmountable".

Within twenty-four hours of the tunnel's opening fifty thousand people had passed through at a penny a time. A million visitors had seen the tunnel within the first fifteen weeks. As one of the sights of the town, Thames Tunnel was a huge success. There was no money left to build connecting roadways to it, and, meanwhile, the railways were taking the place of horse traffic. In 1866, twenty-three years after it had been opened, and more than forty years after it had been begun, Brunel's tunnel was bought by the East London Railway. Three years later, this first under-river tunnel was part of London's underground railway system. It was so well built and strong that no reinforcement was necessary.

Peace certainly has her victories. It seems to me that the completion of the Thames Tunnel was a triumph of the first order. The fortitude of the designer, and the loyalty and great physical courage shown by his son (afterwards to win such fame by the achievements of his own engineering genius) deserve to be long remembered by Londoners. Wapping to Rotherhithe seems simple enough, but it represents one of the world's greatest and most daring advances in the technique of civil engineering.

Engineers in these days set out on the task of building a tunnel with no more anxiety, apparently than you or I would have when thinking of doing a little hoeing in the garden. However, when the second Thames tunnel - which is really only a subway - was built, there were still one or two problems to face. You can see the entrance to that tunnel at Tower Hill. You may have noticed it - a sort of

large brown pillar-box, near the spot where the pleasure boats leave for Southend and Margate. In the well under that roundhouse the lift used to go down to London's first (sic) underground railway. I have been down myself, but not by lift. There is no lift now and no railway. The Tower subway now carries water-pipes and hydraulic power-pipes under the Thames.

They told me to come in an old suit, and asked me if I could climb down iron ladders. Could I? I was an expert by that time! I stepped off Tower Hill, through a door, on to a grating. I could see below - it looked a fair distance below - hurricane lamps hanging on the wall of the shaft, and the iron ladders going down, down. It may have been the lamps that did it. But as I climbed down the sixty-odd rungs, I kept saying to myself: "This is the life!" I have never climbed down the rigging of a sailing ship, but I felt that going down the Tower subway was not a bad training for a sailor's life.

Every twenty or thirty feet there was a little triangular iron deck, just big enough for me (but I was glad I was not beginning to put on weight). Great pipes like funnels run alongside the ladder. Yes, it was very much after the style of a sea-faring life. Now and again I caught the whiff of fish from Billingsgate.

At the bottom of the ladder I stepped down two or three more iron steps to a curved brick chamber. That used to be the waiting-room when passengers went under the Thames by the first tube railway. A few yards ahead was the tunnel itself - about six feet high, and built with riveted plates exactly, it seemed to me, on the plan of the London Underground railway. Everything was neatly tucked away in its place, but there was not much room, and most of it was taken up by the pipes.

This tunnel, which became London's first tube railway, was begun in1869, and it ran under the Thames from Tower Hill to the Surrey side of the river at Vine Street, near Pickle Herring Street.

The Tower Subway is unusually interesting, for in its making, and for the first time, a method was adopted which is now applied to the building of London's Underground railway system. "It is," we are told, "the first example of the

tube method of tunnel construction, utilizing a shield to excavate a circular tunnel, which is afterwards lined with a segmental iron cylinder".

Peter William Barlow, F.R.S., who built the suspension bridge at Lambeth, thought, while at work on it, that the cast-iron cylinders used to support the bridge might be "driven horizontally under rivers with perfect safety". With his son as engineer in charge, and with James Henry Greathead as contractor, the design was put into effect by the Tower Subway Company. Work was begun in February 1869, and before the year was out, this tunnel, slightly over a quarter of a mile long, was completed. The boring under the river, a distance of eight hundred and ninety feet, was finished in fifteen weeks.

Quite a lot had been learned from Brunel's experiences. This time, Barlow decided that the subway must be placed deeper below the river bed than Brunel had been advised to lay the Thames Tunnel. The average distance between the top of the subway and the river bed was thirty feet. An excavating shield was made with a cast-iron cutting edge, and the work proceeded without interruption.

A bed of concrete was laid in the tube, and on this foundation a narrow-gauge single-track railway line was built. Two underground waiting-rooms were also constructed, one at the foot of each shaft, and all was ready for the bus, which was pulled by a steel cable worked by two steam-engines.

There was room in this first tube railway carriage for fourteen people. First-class passengers paid twopence, which gave them the right to get on first at the rush hours. Once on, they took their places with the penny passengers. Everything would have gone well had the transport mechanism of the time been equal to the tunnel construction. But the steam-engines, which worked both the lifts (or iron cages) and the propelling cable, were situated at the bottom of each shaft, and, no doubt, made their presence felt.

The tunnel was so built that the carriage would set off cheerfully down a fair gradient, and finish its journey 'uphill'. That was another good idea, since adopted by tube railways, but it was well in advance of the machine.

There were buffers at each end of the tube 'connected with very strong springs of vulcanized indiarubber'. I imagine that those buffers may have been often called into action. What is certain is that the seventy seconds' journey was not infrequently interrupted by breakdowns, and after a few months the carriage and its mechanical accessories were removed. London had to wait for electricity to turn to practical account Barlow's clever scheme.

Wooden staircases were built in each shaft, the permanent way was turned into a footway, and in December 1870 the Tower subway was opened, on payment of a halfpenny toll, to pedestrians. It worked well. A million people used the tunnel every year until 1894 when the Tower Bridge was opened. After that, the public had no need to cross under the Thames; a few yards away they could cross over it. The subway was bought by the London Hydraulic Power Company for carrying its mains under the Thames. Now, together with two pipes of the Metropolitan Water Board, these power-lines are admirably protected by an under-river tunnel which is the parent of all tube railways.

to be concluded.

LETTERS TO THE EDITOR

2nd August 1968

Dear Sir,

I thought you might like to draw members' attention to the fact that the Financial Times intend to publish a 6 page supplement on the Victoria Line. Unfortunately the date of issue of this supplement is not yet decided but it will be some time in October 1968.

Yours faithfully,

139 Brighton Road,
Purley, Surrey,
CR2 4ME

A.G.Newman

28 June 1968

Dear Peter,

I was most interested to read Ken Harris' article and C.Essex's letter regarding destination plates, in

recent issues of the Journal. As you know, I am particularly interested in this aspect of the Underground. I would like to add a few comments on this subject.

The statement that East Barnet never existed may well be literally true, nevertheless Mr. Essex may like to see an 'East Barnet' plate; I know of two which were rescued when the Piccadilly standard stock was sent for scrap. I have not been able to establish which station was intended to have this name.

The information about Hyde Park was very interesting - I have never seen either a plate or a blind showing this. If anyone has a photograph of it, I would like a copy for the photo collection. Hounslow Town and Hounslow Barracks were, as far as I know, never carried by District trains - the MDR plates, like the Piccadilly ones and later the blinds, merely read 'Hounslow'.

'Ealing Common' on the Piccadilly Line was used for trains running to the depot there in the days when the District Line had peak hour trains to Hounslow (i.e. before 9 October 1964) which were stabled at Northfields depot. Presumably for some operating reason, it was found necessary to stable a similar number of Piccadilly Line trains at Ealing Common (there being 6 District trains kept at Northfields against 4 Piccadilly at Ealing Common.) It is interesting to note that despite 'progress' Northfields is still officially a District depot. Long may it remain so.

Other redundant District plates were 'Uxbridge', 'Gloucester Road', 'Bow Road', 'Plaistow', and 'Whitechapel' though this last is frequently used on the two Sunday morning trains to Aldgate East when the proper board cannot be found.

'Addison Road' was a Met Line plate often found now on the Bakerloo, on the back of 'Neasden', but painted out.

Let's have more notes on destination plates and blinds.

6 Redcliffe Street, Yours faithfully,
West Brompton, London, S.W.10. G. Jasieniecki

2-6-68

Dear Sir,

I would like to add, if I may, to Ken Harris's interesting article in the June issue of "UndergrounD".

I had the privelege, some time ago, of examining the boards of a withdrawn Q23 motor car. Included in the set were the following:

South Harrow
Northfields
South Acton

I can understand why South Harrow and Northfields should be carried, but would be pleased if an explanation could be given for South Acton, as this branch was worked by two special double-ended Q23 motors. If my memory is good, these never carried destination boards, anyway. Also, I think it is interesting that whilst all Q stock carried

Aldgate

I have never seen any later District stock displaying this on the Putney Bridge-Aldgate service, using

Special

instead.

On the East London Line, nowadays, most trains carry

Olympia

at the end facing Whitechapel and

Whitechapel

at the New Cross end (!)

Finally, there has never been a station between West Ruislip, and Denham, although London Transport intended to open one as part of the 1935-40 works plan.

Yours sincerely,

B.Hayles

18 Crown Road,
Chelsfield,
Orpington, Kent.

3rd August 1968

Dear Sir,

I must write and apologise to Mr Harris for my "East Barnet never existed" in the July issue of 'UndergrounD', but I must confess that I have yet to see such a board although I have been given a hint where to look.

My other reason for writing to you is to ask if there is any member who has in their library a photograph of locomotive no. L34, the ex-U.E.R.L. outside-cylindered 0-4-2T built by Messrs Kerr Stuart in 1922 for the tube lines.

I would be most obliged if you could publish this letter in the hope that I may be able to obtain the loan of a photograph of this engine in it's last years with London Transport. I am attempting to model this, and to anyone who models, a 'photo' is most invaluable.

Thanking you for your attention,

I remain,

20 St Leonards Road,
Ealing, London, W.13.

Yours faithfully,

C.I.Essex

1.8.68

Dear Mr. Davis,

I notice the junction points at New Cross (former South Eastern Railway) with the up line connection to the E.L. line have recently been removed.

This connecting line has not been used for regular traffic since 1940; it will probably be removed entirely at an early date. Can you ascertain when the points were actually taken out, and include a suitable paragraph in the Journal, please?

Yours sincerely,

167 Cornwall Road,
RUISLIP, Middlesex.

H.V.Borley

1st August 1968

Dear Mr. Davis,

There is another aspect to the reported suggestion by B.R. of making passengers rebook whenever a change of train is made from one line to another. Passenger fares are already charged in a manner which compels the passenger to pay for complete units of one mile and thus, in the majority of journeys he pays for a distance up to slightly less than a mile which has not been travelled. The present fare for a journey needing one or more changes and based upon the total distance travelled involved only one of these possible untravelled but paid for sections of a mile; but if the passenger is compelled on this same basis to pay separately for different sections of his one journey, he will then, in most instances, be charged for two or more sections of a mile which in total will sometimes exceed the one-mile distance. Hence his journey will be likely to cost him more even though no increase has been made directly in the fare rate charged. To quote an example of this. If a passenger makes a $8\frac{1}{2}$ mile journey, needing a change of train after the first $3\frac{1}{4}$ miles, he is now charged for 9 miles; but if the suggested change comes into operation he would be charged for 4 miles for the first section plus 6 miles for the second $5\frac{1}{4}$ mile section, making a total charge for 10 miles and $1\frac{1}{2}$ miles in excess of the journey actually made. British Railways are now continually running at a loss and one can only deeply wonder how they hope to improve matters with such a scheme as this - which places an additional burden on a long-suffering and decreasing passenger level.

Yours faithfully,

Frederick F.Brown.

16 Pendrell Road,
Brockley,
London, S.E.4.

NEWS FLASHES

NF 774 The very first pocket-sized Underground route diagram to show the Victoria Line seems to be that of the Central London area (in black and white only) that

appears on page 232 of the Summer 1968 edition of LT's Green Line Coach Guide. For good measure, this shows the whole of the new line, except the Brixton extension, as open.

NF 775 There was a fall of gravel in the Victoria Line extension workings at Stockwell on the night of 14-8-1968, and this affected the Northern Line tunnels there. The Northern Line was closed between Clapham Common and Kennington until the commencement of services on 16-8-1968, a substitute coach service being run between these two stations, calling at intermediate stations en route.

NF 776 So many drivers have applied for train operators jobs on the Victoria Line that a staff shortage has been created on other lines - as a result of which trains have been cancelled. Average pay for train operators is said by LT to be about £30 per week.

NF 777 A stock transfer on the night of 4/5-7-1968 comprised 8 cars of Victoria Line stock ex Ealing Common depot to Northumberland Park via the Piccadilly Line as far as the crossover east of Arsenal, where it was coupled to Victoria Line battery locos for the rest of the journey.

NF 778 At Finsbury Park a temporary booking office was opened on 9-6-1968 near the Eastern Region ticket office by the Station Place entrance. The booking office at the entrance to the eastbound Piccadilly Line platform (normally opened for morning peaks only) was closed on 7-6-1968. and the main office at the entrance to the westbound platform shut after close of traffic on 8-6-1968.

NF 779 Re the top line to Uxbridge at Harrow-on-the-Hill where the track was removed over the weekend of 25/26-2-1967, the trackbed has now been removed and excavated down to the flyunder trackbed level, and removal of the retaining wall has taken place. The points to this line were removed by 13-3-1967.

NF 780 The first automatic loudspeaker system for passenger information on LT railways was brought into use at Finchley Road on 19-2-1968; does anyone know if a similar system is planned for anywhere else on the system?

NF 781 Rover tickets have been available daily again this summer (from June 29 to September 30), but fares have gone up - Red and Green up from 6/- to 7/-, Twins

are up from 10/- to 12/-, and Weekenders from 20/- to 25/-, although in the last case there is compensation in that the tickets are now available for use on Green Line coaches as well as Central and Country Buses and the Underground. Half price still applies under 14 yrs.

NF 782 From 12-7-1968 automatic ticket gates have been in use at Warren Street station. Ticket machines in the booking hall have been increased from 3 to 8, and when the installation is complete, there will be a bank of 12 automatic gates - some reversible to cope with rush-hour traffic. The original installation was of 4 gates.

NF 783 From 4-8-1968, new charges at LT car parks came into force - the prices now being:- Daily 2s., Weekly 7s.6d., Monthly 25s., Quarterly 65s. The lower price for longer periods was not at once available at those parks where the automatic barriers were already installed as the equipment needed changing to take plastic tokens - which will be purchased from the booking office at a discount.

NF 784 From 11-8-1968, automatic control was introduced in the car parks at Leytonstone, Buckhurst Hill, Arnos Grove and Cockfosters stations. In each case, only one of the two parks at each station has been converted, the other being reserved for season ticket users.

NF 785 The Bluebell Railway has commenced the renovation of their ex-Metropolitan Railway coaches.

NF 786 Mr. E.Atkinson, Archivist to the British Railways Board has retired, and has been succeeded by Mr. E.H. Fowkes, formerly the Assistant Archivist.

NOT ON THE PROGRAM

A remarkable hazard has presented itself to a small but select group of Underground travellers, namely those who use electronic computers. It appears that if they carry data and programs from one place to another on magnetic tapes and discs, then the whole lot is likely to be ruined by the magnetic fields thrown out by part of the train's electrical system. Your reporter is in a doubly dangerous position - his daily journey to work involves 630v, DC under his feet, and 25000v. AC over his head!

Change of Address Our Vice-Chairman and Secretary, J.P.Wirth has moved to Woodside, 17 Garth Road, Sevenoaks, Kent.

Journal - Postage Rates The new postal charges, combined with the obligatory use of Post Office Preferred sizes of envelopes will apparently double the cost of posting the Journal to members if the present packing method is continued. Will members let the Editor have their views on whether the subscription should be increased to cover the extra charge, or the Journal folded for despatch. Present method will continue to end of this year in any case.

London University Extension Courses in Transport Studies Full details of this year's courses may be obtained from the Editor, or from the Department of Extra-Mural Studies, University of London, W.C.1. The Courses of immediate interest to this Society are London's Railways Past and Present, by R.H.G. Thomas, being given at Brent, and London's Railways 1900-1960 by C.Smith, at Fulham.

THE TIMETABLE

19.00 Thursday 5th September Library Evening at 62 Devonshire Road, Ealing, London, W.5.

19.00 for 19.15 Friday 13th September at Hammersmith Town Hall; our Assistant Secretary, S.E.Jones will give a Paper on the Post Office Pneumatic Railway and other similar schemes. Recalling Sam Jones' Address on the Tower Subway a few months ago, members will know in advance that this will be a meeting worth attending.

19.00 Thursday 3rd October Library Evening at 62 Devonshire Road, Ealing, London W.5.

19.00 for 19.15 Friday 11th October at Hammersmith Town Hall. Our President, Desmond F.Croome, will give the President's Address for 1968. Another important date.

Saturday 12th October Visit to Neasden LT Depot. Please send names to S.E.Jones, 113 Wandle Road, Morden Surrey, accompanied by a stamped addressed envelope.

Sunday 20th October Stand at Open Day, Museum of British Transport, Clapham. In view of the threat to the life of the Museum, as many as can are urged to attend.

Thursday 21st November Channel Tunnel Association Dinner at House of Lords: details as August Timetable - p.128