

THE
LITTLE
BOOK
OF THE
LONDON
UNDERGROUND



DAVID LONG

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UNDERGROUND**

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WITH ILLUSTRATIONS BY LES EVANS

The
History
Press

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All travelling becomes dull in exact proportion to its rapidity

John Ruskin (1819–1900)

AN ALPHABET FOR THE UNDERGROUND



According to data obtained under the Freedom of Information Act, the average commuter on the Metropolitan Line every year wastes three days, 10 hours and 25 minutes due to delays.

Bank station in the early days had its ticket office in the crypt of St Mary Woolnoth, a distinguished Nicholas Hawksmoor church.

Central Line trains make the longest journey on the network, even without the old Epping–Ongar line at 34 miles from one end to end the other.

Down Street, one of more than forty disused or ‘ghost’ stations, is the final resting place of Winston Churchill’s wartime bath.

Euston station tested an air-freshener called ‘Madeleine’ on 23 March 2001. Designed to make the Underground smell nice, it was discontinued the day afterwards when passengers complained about feeling sick.

Fleet Line was renamed before it even opened: changing the name to the Jubilee is said to have cost £50,000.

Greenford’s escalators are unique in that they take passengers up to the trains instead of down them.

Hounslow East to Heathrow is the only stretch of track where anyone wishing to travel only through half a dozen stations beginning with the letter H can do so.

In 1890 passengers were liable for a fine of £2 if they travelled on the roof of an underground train.

Jubilee Line trains are the only ones whose route intersects all the other lines.

King’s Cross takes its name from an unpopular monument to George IV, removed in 1845 after being described as ‘a ridiculous octagonal structure crowned by an absurd statue.’

Leicester Square to Covent Garden is the shortest distance between two Tube stations.

Mansion House and South Ealing are the only station names in which all five vowels appear.

North End station, also known as 'Bull & Bush', closed for good before a single passenger had even used it.

Oval is named after the famous cricket ground, the shape of which was dictated by the layout of the surrounding housing estate rather than the other way round.

Piccadilly Line warnings to 'Mind the Gap' are voiced by the 12th Earl of Portland, otherwise known as actor Timothy Bentinck who plays David Archer in the famous radio soap.

Queen Elizabeth II took her first ride on the Tube as a teenager in 1939.

Royal Oak, Elephant & Castle, Manor House, Swiss Cottage and Angel stations are all named after public houses.

St John's Wood is the only Tube station name on the entire network which uses none of the letters present in the word 'mackerel'.

Temple is the only station name to be shared by the London Underground and the Paris Métro (Similarly both the Norwegian railway and the Underground had a station called Strand, although both of these have since closed.)

Underground trains have only twice been used to transport deceased people in coffins: William Gladstone and Dr Barnardo.

Victoria station has a plaque commemorating the arrival of the body of the Unknown Soldier on platform 8 on 10 November 1920 before its interment in Westminster Abbey the following day.

Waterloo station used to have a special entrance for corpses being conveyed on the mainline to Brookwood Cemetery in Surrey.

X marks the spot: the deepest part of the Tube network is the Jubilee line at Westminster at 104 feet below sea level.

You've probably noticed that the names of Parsons Green, Turnham Green, Redbridge and Stepney Green cleverly describe the colours of the lines on which they appear on the Tube map.

Zoo animals handed into London Transport lost property include three dead bats, a stuffed puffer fish and a dead gorilla.

And, finally, did you know that it's possible to travel from King's Cross to St Pancras to Euston and back again using only northbound trains? This is because the northbound Northern Line runs from King's Cross to Euston, while the northbound Victoria Line runs the other way. Go figure.

THE TIMELINE OF THE TUBE



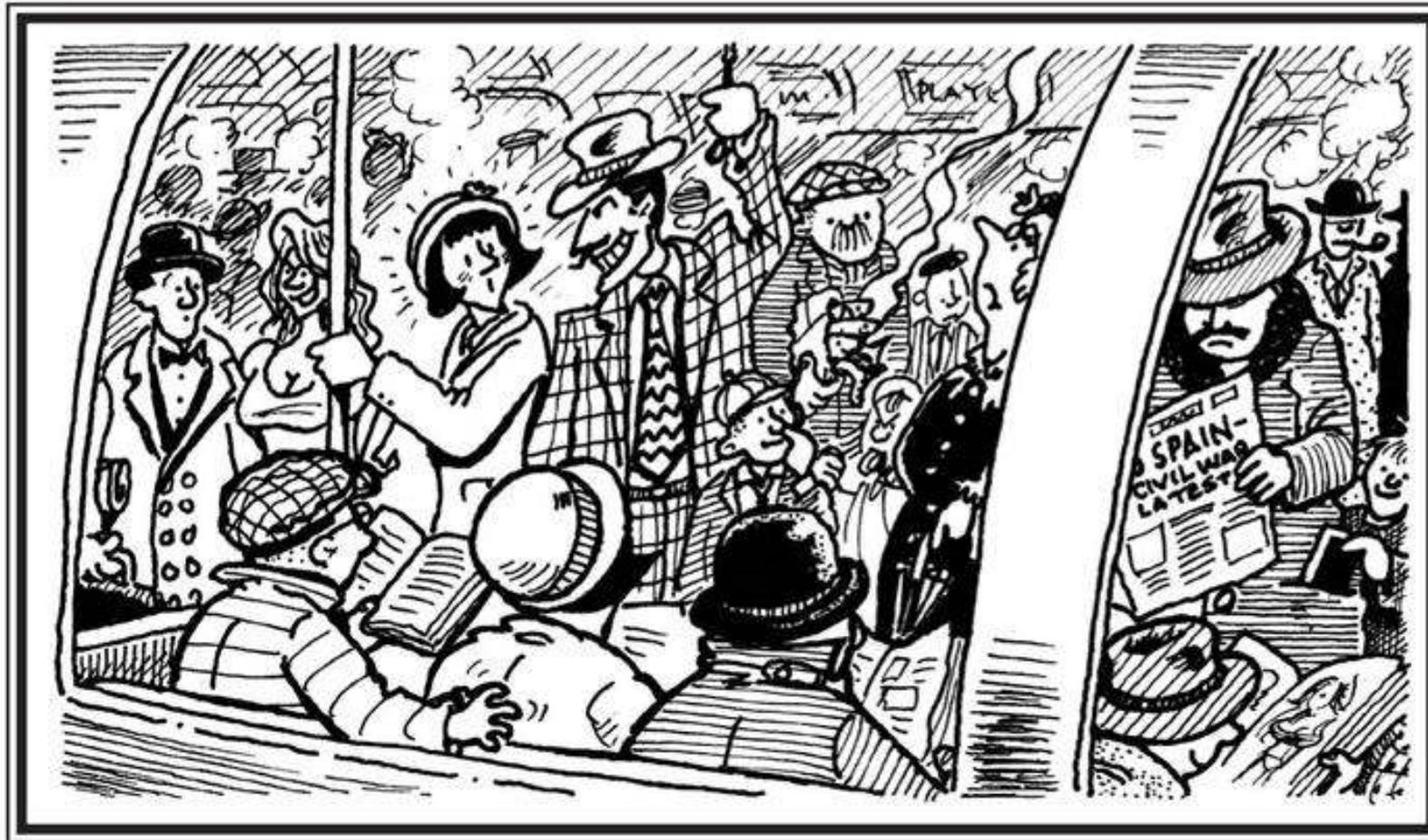
- c. 2000 BC Oldest known railway – a so-called ‘rutway’ – is constructed on island of Malta.
- 590 BC A more sophisticated version called the *Diolkos* uses multi-wheeled trucks or bogies to transport ships across the Isthmus of Corinth in southern Greece.
- 206 BC Emperor Shir Huang Di introduces concept of standard axle gauges across the whole of China’s territories to make transportation more efficient.
- 1550 The earliest record of an actual railway, serving a mine at Leberthal in Alsace, although a window in Switzerland’s Freiburg Cathedral suggests something similar could have been in existence 200 years earlier.
- 1798 Ralph Dodd attempts to tunnel under the Thames, but fails. Marc Isambard Brunel finally manages it forty-five years later – by which time the project’s been nicknamed ‘the Great Bore’ – but at a cost of ten lives and £614,000.
- 1801 The Surrey Iron Railway inaugurates the world’s first public goods railway.
- 1807 The Oystermouth or Swansea and Mumbles Railway begins carrying fare-paying passengers, using horse- or even sail-power in the early days.
- 1829 George and Robert Stephenson’s *Rocket* demonstrates the viability of steam power by winning the £500 Rainhill Trials prize.
- 1838 The London & Birmingham Railway into Euston finally brings train services into the capital.
- 1843 Charles Pearson, Solicitor to the City of London, proposes alleviating traffic congestion by running ‘a majestic eight-track covered way, thoroughly lighted and ventilated’ beneath the streets.
- 1846 A Royal Commission recommends that no railway should penetrate the area between the Thames and the Euston and Pentonville Roads, thus explaining why most main line termini lie on what is now the Circle Line.
- 1855 Such is the level of traffic congestion in the capital that a committee of MPs is told that, starting out from London Bridge, it takes longer to get to Paddington than to reach Brighton.
- 1863 The Metropolitan Railway, London’s first ever underground service, begins running between Paddington and Farringdon. Prime Minister Palmerston elects not to try it himself, declaring that with his eightieth birthday fast approaching he wishes to spend as much time as possible above ground.
- 1869 Brunel’s Thames Tunnel, converted from carriages to pedestrian to rail, is at last used for running trains under the river. Due to reopen in 2010, more than 185 years after work on it began, as the old East London Line it is being transferred to the London Overground network.
- 1884 The Circle Line opens and is described in *The Times* as ‘a form of mild torture which no person would undergo if he could conveniently help it.’ The editor of the *Daily Express* likens his own trip on it to ‘an experience of Hades’ but despite this his son goes on to become chairman of London Transport.
- 1890 Running 1.25 miles from Stockwell to the Square Mile, the City & South London Line opens as the world’s first electric underground railway. *Punch* calls it the ‘Sardine Box Railway’ but another nickname is quickly adopted: the Tube.



- 1900 The Central Line, popularly known as the 'tuppenny tube' and eventually to become the longest line on the Underground network, introduces the first so-called flat-fare
- 1906 In a stunt unlikely to be replicated here, Charles Glidden drives his Napier motorcar along 4,900 miles of railway track from Boston, Massachusetts, before becoming derailed 50 miles outside Mexico City.
- 1908 The Tube, while not yet a unified service, is officially rebranded as the UNDERGROUND. A year later a 14-year-old schoolboy called Edwin Parrington is paid £10 for his slogan, 'Underground to Anywhere: Quickest Way, Cheapest Fare'.
- 1910 The Metropolitan Line introduces two plush Pullman cars, 'Galatea' and 'Mayflower', from Baker Street. Passengers are

charged a sixpenny supplement to ride in greater comfort and the pair remain in service until 1939.

1914 The engineer, research physicist and inventor Prof. Archibald Montgomery Low predicts that by 1999 every station will boast comfortable waiting rooms with 'artistically illuminated screens' showing the latest news.

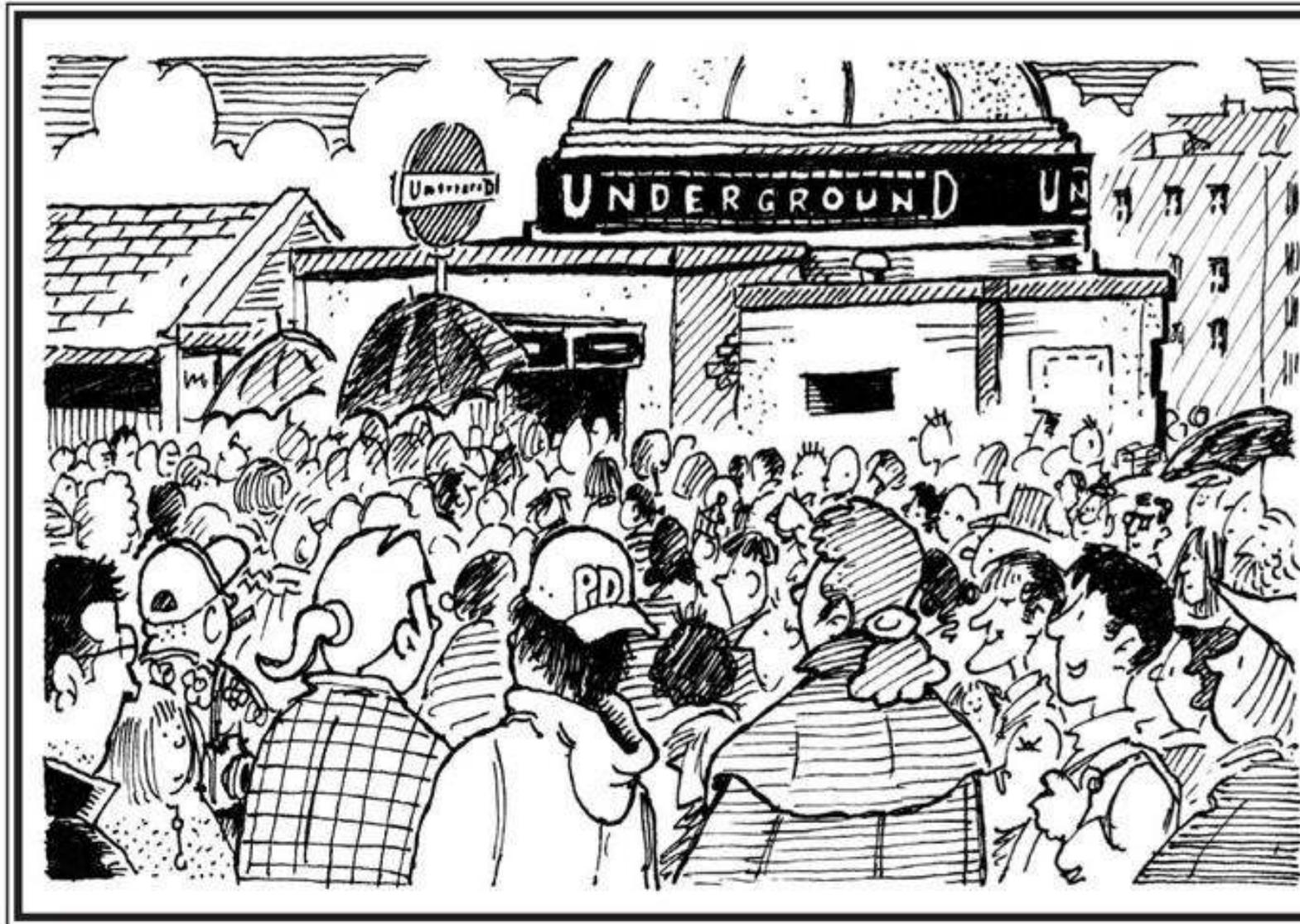


1915 The Underground gets its first female staff members, the men having gone off to fight in the First World War. Before long Londoners begin to shelter in stations for the first time as bombs drop on London from German airships and giant Gotha C-4 bombers.

1926 So-called suicide pits are introduced beneath the tracks to counteract the rising numbers of depressed passengers succumbing to what one coroner describes as the irresistible 'roar and rush of a Tube train.'

- 1933 The newly formed London Passenger Transport Board begins to integrate London's train, bus, tram and trolleybus services.
- 1936 W.J. Kelley MP questions the morality of the railway rush-hour in which 'young girls and men are crowded in such a way that the question of decency even comes up.'
- 1941 As part of Britain's continuing war effort, a secret aircraft components factory is installed in a new section of Central Line tunnel. A year later a Spitfire named *London Underground* goes into service with the Royal Air Force.
- 1948 The first wave of Commonwealth immigrants arrives on the *SS Empire Windrush* and several hundred of them are offered temporary digs in a deep tunnel situated beneath Clapham Common station.
- 1955 London Transport boss Sir John Eliot insists that his passengers are not crammed into the carriages. 'They cram themselves in,' he explains helpfully.
- 1961 Steam locomotives are finally withdrawn from London Underground passenger services, with the last steam-powered shunting and freight-hauling locomotives being stood down a decade later.
- 1970 The Greater London Council assumes control of London Transport heralding years of staff shortages and lack of investment until the Rt. Hon. Margaret Thatcher assumes control.
- 1977 The new Fleet Line is renamed the Jubilee Line to mark the Queen's Silver Jubilee ... but it fails to open on time.
- 1978 Working on the District Line Hannah Dadds becomes the first woman train driver on the Underground turning her into an overnight (if only temporary) celebrity.
- 1987 Fire sweeps through King's Cross St Pancras, the busiest

station on the Underground, killing thirty-one people. The seat of the fire turns out to be a pre-war escalator prompting wooden escalators and smoking to be banned from the network.



- 1994 The Waterloo and City Line is incorporated into the Underground network for the first time, and the charmingly rural Epping to Ongar branch of the Central Line finally closes owing to lack of interest.
- 2004 Nothing whatever is done in response to a House of Commons report that commuters face a 'daily trauma' and are forced to travel in 'intolerable conditions'. Passengers express little if any surprise at this inertia.

2006 A Europe-wide heat wave causes temperatures below ground to soar as high as 47°C (117°F). Posters go up in stations advising passengers to carry bottled water when they are travelling.

2007 For the first time ever the Tube network clocks up one billion passengers in a single year, but shortly afterwards worrying rumours surface about the plan to amalgamate the dreaded Hammersmith & City Line with the Circle Line to produce some weird kind of spiral.

TRAINS IN DRAINS: DEAD ENDS & DAFT IDEAS



With nearly 2.4 million people calling London home, some 250,000 horses – with billions of flies feasting on the one million tons of dung they produce annually – and tens of thousands of bare regulated carts, cabs and carriages crowding onto the narrow streets of the mid-Victorian city, by the second half of the nineteenth century the heart of the world’s most powerful Empire was literally grinding to a halt.

In 1855 Sir Joseph Paxton summed up the problem perfectly when he told a group of MPs that for the average traveller it actually took longer ‘to go from the London & Brighton station at London Bridge to the Great Western station at Paddington than from London Bridge to Brighton.’ Clearly something had to be done – and to the technologically obsessed Victorians, trains of some sort seemed to suggest the best answer – but as the following list of complete or semi-non-starters shows, it was to take literally decades to determine precisely what was most likely to succeed.

1836: HIGH ABOVE THE THRONG

Choosing to rise above the traffic rather than tunnel beneath it, London’s first ever railway, the London & Greenwich, ran almost its entire length along an elevated, Roman-style viaduct with its southern terminus modelled on a monument of the Acropolis. This enabled the trains to avoid the usual congestion down at ground level, and must have improved the view out for passengers. Doing this way was extremely costly, however – the expensive and time-consuming construction of no fewer than 878 separate brick arches making it the world’s longest viaduct.

Besides the cost there were other considerations too, and not long after the railway’s grand royal opening, letters started to appear in the press complaining about the infernal noise of ‘the thundering steam engines and omnibusters’.

Others objected on the grounds that it was a sin to travel on the Sabbath; nor did they enjoy the prospect of ladies of loose morals plying for trade beneath the arches. Men of science similarly lobbied the authorities to stop it, the Astronomer Royal eventually being given permission to stop the trains each evening in order that he could read his instruments at the Greenwich Observatory. Little wonder that plans to extend the line all the way to Gravesend were soon abandoned....

1839: RUNNING OUT OF PUFF

Samuel Clegg and marine engineers Jack and Joseph d’Aguilar Samuda obtained a patent for a s

called atmospheric railway. First tested in June 1840 at Wormwood Scrubs, this used air pressure in a pneumatic tube laid between conventional rails together with a piston suspended from the train and connected through a sealable slot in the top of the tube.

Using stationary pumping engines along the route, air was expelled from the tube leaving a vacuum ahead of the piston so that (with air admitted to the tube immediately behind it) mere atmospheric pressure would be sufficient to propel it forward together with the attached train. The theory was elegant to say the least, and explained in Joseph Samuda's *A Treatise on the Adaptation of Atmospheric Pressure to the Purposes of Locomotion on Railways* – but unfortunately putting it into practice proved far from straightforward.

The first to have a go in the capital was the London & Croydon Railway which went into regular service in January 1846 only to close under 16 months later when the brothers were unable to fix several problems with the pumping equipment and leaking seals in the delivery pipes. Undeterred, the great Isambard Kingdom Brunel, a self-confessed workaholic who acknowledged that he had been bitten by the bug, tried a similar system on the South Devon Railway – only to have the local rats eat through the leather seals designed to keep the pipes airtight.

Eventually the Samuda brothers gave up too and went back to shipbuilding on the Isle of Dogs. After constructing a number of ships for the Royal Navy and the Prussian, Japanese, Egyptian, Argentinian and Brazilian navies, they are today commemorated in the name of the Samuda housing estate in Cubitt Town.

1840: LONDON'S OWN PUSHMI-PULLYU

The Commercial Railway, later renamed the London and Blackwall, was conceived by Sir John Rennie – the knighthood was granted in recognition of his work on a new London Bridge – but the project itself was handed on to Robert Stephenson.

Keen to try a new means of propulsion, and drawing on his own experience with the Camden Incline on the London and Birmingham Railway, he decided upon a cable-haulage system powered by powerful stationary steam engines mounted at either end of the 3.5-mile line.

With two tracks operating independently of each other, and running from Blackwall to the Minories and Fenchurch Street, the system required some 14 miles of hemp rope. As one engine wound this from one end, an equivalent length would be paid out at the other with metal swivels inserted at intervals in order to resist entanglements. Individual carriages were despatched in groups of two, three or four, with an electric telegraph system linking the stations and the power supplied from eight marine steam engines manufactured by Maudslay, Sons and Field.

With four steam engines in use at any one time (and four more undergoing repairs or routine maintenance) the available power varied from 75hp to 110hp with the more powerful units being needed at the City end in order to pull the carriages up a slight incline from the east. Unsurprisingly rope wear was considerable and when replacement hawsers of steel proved too prone to kink, the

experiment was halted. In 1848 the line was converted to conventional steam locomotives, and today (with admirable economy) the DLR still runs over part of the same route.

1861: FOWLER'S GHOST

By the 1860s, with plans well underway for parts of the railway in London to dive underground, a need existed to find an alternative to conventional steam engines. Clearly Stephenson's cables and stationary engines were not the answer but 'Fowler's Ghost' – the nickname given to a prototype designed by London railway engineer Sir John Fowler Bt. – was soon being heralded as one possible solution to the pressing problem of smoke in the tunnels.

As the world's first experimental fireless locomotive, the Ghost was designed to store energy using heated bricks in a manner not dissimilar to that later employed by domestic night-storage heaters. The locomotive itself looked pretty conventional, a broad gauge 2-4-0 tender with a normal firebox connected to a large combustion chamber containing the aforementioned bricks. It was designed to operate as an ordinary coal-fired engine on open stretches of track before switching to stored heat from the firebricks as it approached a tunnel. It was put to the test only once, however, but straight away deemed a failure and after two years in mothballs it was broken up and sold.

1863: SMOKING ROOM ONLY

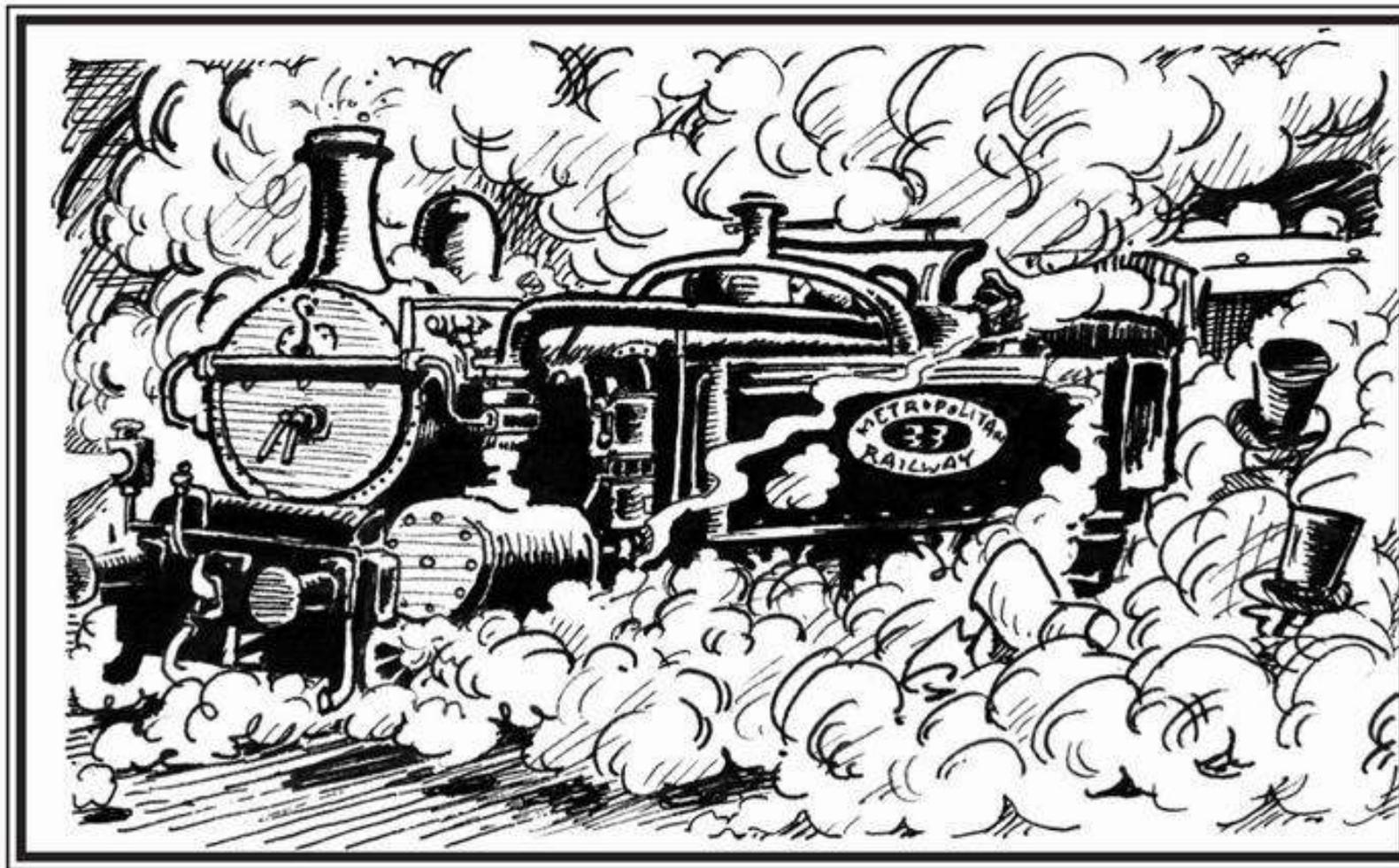
With the Metropolitan Railway's new underground section up and running by 1863, and Fowler's Ghost now firmly exorcised, the directors still needed to find a practical means of propelling their trains. Ejecting the smoke from conventional steam engines into these early, much shallower cut-and-cover tunnels simply wasn't an option if they wished to avoid suffocating the crew and the passengers with a toxic mixture of steam and sulphurous smoke. Instead it was decided to commission special 'condensing engines' which emitted less steam and smoke than conventional locomotives. This could then be routed into large tanks fitted behind each locomotive, tanks which could then be discharged or vented off each time one of the new underground steam trains broke cover.

As a solution it was far from ideal, but as a temporary solution it seemed to work well enough and a century and a half later visitors to West London can still see evidence of it in Leinster Gardens, W. At first glance Nos 23 and 24 look like real houses, and indeed in the 1930s a successful householder scammed hundreds of guests out of 10 guineas a head for a ticket to a charity ball advertised at the address.

The reality, however, was that in 1867, when the line was being extended to Paddington, both houses had been dismantled leaving just their 5ft-deep façades. The space behind was left vacant, somewhere for the trains to empty their smoke boxes before disappearing into the next tunnel, and today District Line trains can still be seen rattling along directly beneath the houses before re-entering the tunnel.

The aforementioned condensing engine which made this possible was designed and built by one Daniel Gooch who had sprung from a family of notable railway engineers and trained under both

Stephenson and Brunel. His early triumphs had included driving Queen Victoria at a heady 44mph on his locomotive *Phlegothon*, although he was subsequently ticked off by Prince Albert and informed that the experience had badly frightened Her Majesty who did not wish to travel at such a pace again (nor did she ever.)



Things didn't always go his way, however. After rescuing the Great Western Railway from bankruptcy in 1865, his attention turned to international telegraphy and, after buying Brunel's old ship *Great Eastern*, he attempted to lay the world's first submarine cable across the Atlantic. On board to observe the proceedings he suffered the agonising experience of seeing the cable break and sink without trace after more than 1,200 miles of it had been successfully laid across the seabed.

1864: A NEW USE FOR PNEUMATICS

At Crystal Palace Park in 1864 Thomas Webster Rammell tried a radically new spin on the concept of an atmospheric railway, dispensing with the small-bore tube laid between the rails and instead building a tube large enough to accommodate entire carriages which could then be forced along using air pressure. He had already tried building a smaller, freight-only version of this concept for the General Post Office, but as a further refinement he now fitted a semi-airtight 'collar' of stiff bristles to the carriage which he intended sucking along the airtight tunnel using a 20ft-diameter steam-powered fan.



According to a report in *Mechanics Magazine* at the time, ‘from the Sydenham entrance to the armoury near Penge-gate, a distance of about a quarter of a mile [Rammell laid] a simple brick tunnel nine feet high and eight feet wide, a size that renders it capable of containing an ordinary Great Western Railway carriage.’ Able to seat thirty-five, it was said to be good for around 25mph, although the length of the tunnel suggests it was conceived more as means of entertainment (a trip cost 6d) than as a serious mode of travel.

After very few months it closed for good, and little more was heard of it except in connection with a popular urban legend suggesting that the site was haunted. Rumours of this started in the 1930s, and then in 1978 an elderly local claimed in her youth to have found the tunnel and seen in the darkness an old railway carriage filled with skeletons dressed in Victorian garb. Unfortunately no corroborating evidence for this has been forthcoming, and is anyway unlikely ever to do so as the site was levelled for the Festival of Empire celebrations in 1911.

1864: MESSING ABOUT ON THE RIVER

In common with various schemes for running rails underground, the Thames Viaduct Railway sought to keep its passenger service well out of the congested thoroughfare – in this case by locating the railway midstream in the Thames, suspended over the water by means of a giant latticework of steel kept aloft by cylindrical piers driven into the riverbed.



With termini at Westminster and London Bridge, the railway would have provided a fast, five-minute express link between the seats of political power and commerce with a stop along the way servicing the Law Courts between the two. At the same time, argued its promoters, ‘the overcrowded mis-called thoroughfares could be relieved, a crying nuisance abated and an urgent need satisfied.’

The brainchild of J.W. Heppel and Glaswegian engineer James Samuel, the scheme also claimed to solve two of the greatest conundrums facing the early railway pioneers – how to clear the intended route of buildings, and how much to compensate landlords for the loss of these buildings – doing so by building where no other buildings existed. The scheme also obtained the support of the respected and influential Robert Stephenson, but in the event was overtaken by events and – once the notion of running the trains underground had been accepted – there was no need to pursue the viaduct idea any further.

1865: LAST GASP FOR ATMOSPHERICS

The southern part of the modern Bakerloo Line includes the oldest attempt at a tube railway, the Waterloo & Whitehall Railway, the promoters of which were granted leave to construct another form of pneumatic railway from Great Scotland Yard to York Road. Rather than tunnelling under the Thames their scheme called for a single cast-iron tube 12ft 9in in diameter to be laid in a large trench dredged across the bed of the river and running parallel to Hungerford Bridge.



To propel the trains through this, large fans installed at the Waterloo end would then be used to blow or suck individual carriages from one end of the tunnel to the other, a form of propulsion which T.V. Rammell insisted he had demonstrated satisfactorily at his Crystal Palace Park scheme.

This time though, Rammell envisaged a regular service rather than a simple shuttle, running fifteen trains an hour between 7 a.m. and midnight with a first class ticket costing 2d, second class passengers travelling for a ha'penny less, and those of the third class for just 1d. Each according to his status Rammell insisted, would enjoy accommodation 'as commodious, as well lighted and as completely fitted for the comfort of the passenger, as those of the Metropolitan Railway.'

Work on the tunnel started forthwith but a general financial crisis at the time prevented the necessary capital being raised –£42,452 had been spent but only £42,170 raised – and by 1868 all work had to be abandoned. The company was eventually wound up for good seventeen years later, although one end of the brickwork for the trench survived intact beneath Whitehall Place and now forms part of the wine cellar of the National Liberal Club.

1868: TOWER SUBWAY

The right idea but at the wrong time, P.W. Barlow's tunnel is notable for the cheapness of its construction. Still the only privately funded, privately owned tunnel under the Thames, it cost only £16,000 as opposed to the £614,000 Brunel spent at on his tunnel at Wapping. It is still there today and is still used commercially.

Using James Greathead's pioneering tunnelling machine, and working at an impressive rate of 4.5ft per day, Barlow's men completed the job in an incredible ten months, after which Barlow started running twelve-seater cable cars through the tunnel. Charging a fare of just a penny one way or tuppence first class, the journey took seventy seconds with the power coming from a 4hp stationary steam engine mounted at the southern end of the line.

Unfortunately the service was considered too slow by many users, and after just three months the cable cars were withdrawn and the tunnel converted to a footway. The conversion complete, an estimated one million pedestrians a year were soon making their way from one side of the river to the other, but then in 1894 Tower Bridge opened offering a similar facility at no cost and without the very considerable claustrophobic effect of Barlow's 7ft diameter tunnel.

Thereafter Tower Subway was sold to the London Hydraulic Power Company, which since 1871 has been using a hidden network of nearly 200 miles of tunnels, pipes and ducts to channel power around London to raise theatre safety curtains, cranes, hotel lifts and so on. Surprisingly, the LHPC survived until the 1970s at which point electricity finally triumphed over hydraulics and a consortium led by the Rothschilds took over its assets and converted the subway into a conduit for cable television and other, somewhat more up-to-date applications.

1882: ELECTRICITY SPARKS, BUT THEN DIES

The year the Waterloo and Whitehall Railway company finally ceased to be, a new entity called the Charing Cross & Waterloo Electric Railway Company proposed running a similar but slightly longer route from Trafalgar Square to Waterloo station.

This too was to have been a sub-surface line, crossing the Thames in twin cast-iron tubes laid in trenches dug into the riverbed, but an additional sophistication was the radical proposal to use electricity to power trains despite the fact that London's first electricity-generating power station was still some seven years away from completion.

The scheme was backed by Dr C.W. Siemens of the prestigious German electrical engineering company, with a bank of steam-driven dynamos being planned for installation beneath what is now the north-west corner of Waterloo mainline station. Unfortunately, the death of Dr Siemens and the resulting financial woes of his company more or less stopped the scheme in its tracks.

Thereafter, and despite a claim in its prospectus that the initial 60ft of the first tile-lined tunnel had already been excavated beneath the Victoria Embankment and Northumberland Avenue, the company struggled to raise additional finance. According to the *Railway News* it was simply too novel for its own good, and indeed even the normally staid *Pall Mall Gazette* described it as 'one of the undertakings in which science verges on the borders of romance.'

By 1885, even as the directors were proposing a Bill to extend the line, another Bill (of Abandonment) was being pushed through and on 16 July – barely three years after starting out – the company was formally wound up by Act of Parliament.

1905: THE REVEREND'S HIGH-SPEED RAILWAY

Often described as an early monorail, the Kearney High-Speed Railway was strictly speaking a two-rail system, albeit something of a double-decker arrangement with one rail placed below the train and the other above it. A set of flanged wheels running along the former provided the traction, while another pair fitted to the upper rail provided guidance.

Despite giving his name to the technology, Elfric Wells Chalmers Kearney was more promoter than inventor, the two-rail idea having originally been proposed by his fellow Australian, the Revd R.I. Thom. Kearney himself undertook much of the development thereafter and estimated the top speed to be somewhere between 130mph and 150mph.

Besides this impressive velocity, the technology appeared to offer a number of advantages including very rapid acceleration, a low centre of gravity, and reduced friction thanks to the use of ball-bearings and the gyroscopic effect of a train in motion reducing the contact between the upper wheels and rail. The carriages were also quite luxurious by the standards of the time.

The technology itself, however, proved rather too bulky for tunnel work (requiring a diameter of at least 14ft), although this did not prevent Kearney arguing for two new lines to be built across London. The first would run from Cricklewood through Victoria to the Oval, where it would connect with a second running north to the Strand and south-east to Crystal Palace. A journey from Cricklewood to Brixton, said Kearney, would take less than fifteen minutes.

To prove this in 1908 he built a working scale model some 200ft from end to end, described in the *Railway Engineer*. After demonstrating a single carriage running at the equivalent of 400mph – at a time when the official Land Speed Record was barely 125mph – the scheme received the enthusiastic acclamation of the City of London Tradesmen's Club but there was little interest from anyone else and the railway was never built.

Kearney remained bullish, however, and scaled back his plans to a single line running beneath the Thames linking the Woolwich Royal Arsenal and North Woolwich station three-quarters of a mile away. With a journey time of just one minute it was a modest enough proposal which the *Railway Magazine* thought likely to succeed – but it too never left the drawing board.

Despite this second failure, Kearney's enthusiasm remained undimmed and he continued to champion similar schemes in Sussex, North and South Shields, Boston and New York – all with no success. Finally, still banging the gong for the Revd Mr Thom's technology after the Second World War, he proposed a scheme linking Venice and the Lido. Like the rest it was stillborn, and by 1950, having switched careers, Kearney was busily engaged writing science fiction.

1930: BENNIE'S AIRSPEED RAILWAY

An even more eccentric proposition than Kearney's double-decker monorail, George Bennie's Airspeed Railway – also known as the Railplane – aimed to separate fast passenger traffic from slow

freight trains, but was similarly ill-suited to tunnel work as each carriage was fitted with a pair of large, 9ft diameter four-bladed aircraft propellers, one at either end, each driven by electric motors.

Although his suspended monorail looked and sounded like something dreamed up by W. Heath Robinson, Bennie as an engineer and inventor is distinguished from your average experimental trailblazer by the fact that he managed to design, fund and build a genuine, working, full-size prototype.

This ran for more than a quarter of a mile over the disused LNER sidings to the Burnbrae Dyeworks in Milngavie near Glasgow, the Railplane's single carriage an elegant, streamlined cigar shape luxuriously appointed with stained-glass, deep carpets, individual table lamps and curtained windows. On 8 July 1930 press and other VIPs were offered a test-run in it, one of Bennie's guests noting that 'the Railplane operated with perfect smoothness and passengers only knew the car was moving by gazing out of the window at the passing landscape. There was no bumping over rails, smoke or whistles shrieking ... a sheer delight.'



Bennie's innovation, not unnaturally, attracted a number of interested visits from engineers from around the world, was hailed as 'a triumph of Great British Brains' and generously reviewed in *Railway Wonders of the World*. It also won a prestigious gold medal at the Industrial Exhibition in Edinburgh.

Before long there was talk of a fully working line between Victoria and Croydon Air Park, but unfortunately a global financial downturn meant that Bennie was never able to attract sufficient funding for his dream. Once again the sheer novelty of the proposal proved problematic; so too did the

sample content of Little Book of the London Underground

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- <http://fitnessfatale.com/freebooks/The-Lyme-Disease-Solution.pdf>
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