

# **Timekeepers, an extract**

## **Chapter 3: The Invention of the Timetable**

### **i) The Fastest Thing You Ever Did See**

Do you plan on being alive for the next two-and-a-half years? If the answer is Yes, you may begin building Mallard. This magnificent British steam locomotive, streamlined and Garter Blue, is available for construction each week from your newsagent, and if you keep the faith for 130 weeks, and buy all the bits required and assemble them, you will end up with a 500mm-length engine and tender (almost 20 inches), weighing about 2 kilos.

Mallard was originally built in Doncaster in 1938, but in 2013 the publishers Hachette offered the amateur modeler the chance to build a highly detailed replica as a part-work, a precision-tooled miniature of the 'O' gauge variety, designed to run on 32mm track ('track not included'). The model is made from brass, white metal, etched metal and an intricate metallic casting process called 'lost wax', and requires not only considerable patience and skill to assemble, but also tools including round-nose pliers and top-cutter pliers, and a recommendation to wear protective gloves and a face mask. When you have finished making your model, you may then paint it (paint not included).

Issue Number 1, priced at only 50p, consists of the first metal parts and a magazine that tells you a bit about Mallard's history and great railroad enterprises such as the Trans-Siberian Railway. The magazine is hole-punched for easy storage, and, after a few weeks, the magazines should be put in a binder (first binder and dividers included free with your second magazine; subsequent binders not included).

The first choice you must make is whether to superglue or solder (solder not included and not recommended). Instructions for the first week's parts, which will make the driver's cab, come in twelve sections, and include using the top-cutter pliers to remove all parts from the fret,

smoothing the edges with wet & dry sandpaper, punching three dots in each tab to form raised rivets, and placing the left-front cab window bead in position with the pliers. If you actually like doing this you will be delighted with the free Modeller's Magnifying Glass to inspect the smaller parts (if you reply within 10 days), and a black-and-white A3 print of the original Mallard in thunderous action down a slope.

Issue 2, priced at only £3.99, contains the next part of your model (nose section and boiler skirts) and a feature on the West Highland Line. If you subscribe, you will also get a magnificent set of Mallard drink coasters in a tin. Not much happens with Issue 3, apart from the arrival of the main boiler and a price hike to £7.99 (the standard price for each issue from now on), but with Issue 4 you get a free Modeler's Toolkit, including a stainless steel ruler and 2 mini-clamps. With Issue 5 there are details of how to motorise your Mallard when you have completed it (motor not included).

The bit-part Mallard is a costly enterprise. If you wish to make the whole thing, and surely there can be little point stopping at issue 10 or 50 or 80, then you need to buy all 130 issues, and all 130 issues will cost a total of £1,027.21. The original locomotive from Doncaster, 70-foot long and 165 tons, taking hundreds of thousands of passengers on an express journey from London to Scotland and back for 25 years - about one and a half million miles of track-travel in all - cost £8,500. You didn't need binders for the original train, but you do for the instructions for the model, each costing an extra £6.99. In addition there is an item mysteriously classified in the early promotional material as 'special issues', which presumably come at a special price.<sup>1</sup> (As it also says in the promotional material, 'This product is not a toy, and is not designed for use in play'.) It would be cheaper to buy the kit direct from DJH Model Loco in Consett, County Durham, where, for just £664, you get it all in one delivery in one big box. DJH Model Loco even offers a service in which someone will speed everything up and build the damn

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<sup>1</sup> A neat loop: Hachette's founder, Louis Hachette, founded his publishing and part-work empire on train station book stalls in the 1820s, in the same manner as WH Smith.

model for you in a couple of weeks, although that would surely be missing the point. For Mallard has always been about time. Time is why she was built.

Perhaps you can imagine the train coming down the track on Sunday 3 July 1938. The engine, tender and cars are blue, although whether you'll be able to see this as it speeds past you is questionable. There is also a rickety brown carriage early in the chain, known as a dynamometer car, and within this are men with stopwatches and machines that resemble primitive lie detectors and heart monitors. The train is travelling so fast that it appears to be 'hunting', the phrase engineers use to describe a locomotive hurtling at such a velocity that it is swaying from side to side, as if it was searching for the fastest route to its destination, happy to jump to another track if need be. Its destination is London, but it will overheat long before then.

You are watching the train from Stoke Bank, not far from Grantham. The threat of war hovers. Twelve-year-old Margaret Roberts is at school up the road. The hurtling train, and its memory, will swiftly become one of those iconic prewar images, like the last of the country house shooting parties before Britain went dark. What it is about to do will never be bettered, and the anniversaries – 25<sup>th</sup>, 50<sup>th</sup>, 60<sup>th</sup> and so on – just can't come soon enough. People who love trains love this train as much as they love anything.

Similar locomotives in this group, known as A4 Pacifics, were designed to look and perform like Mallard, and their engineer Nigel Gresley gave them all similar names: Wild Swan, Herring Gull, Guillemot, Bittern and Seagull.<sup>2</sup> But to Gresley – 62, failing health, his designs internationally recognised and copied, his trains, including the Flying Scotsman, lauded for both safety and comfort, an engineer comparable in achievement to the Stephensons and Brunel – none of them appeared to be *chosen* like Mallard, with her dynamic lines and increased cylinder

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<sup>2</sup> When a statue, bound for King's Cross, was cast in 2015 to mark the 75th anniversary of Gresley's death there was some controversy in the railway and duck press over whether a mallard should appear at his feet. The duck appeared in the early designs, but in the end, it was decided against.

pressure, and her new brake valves, double chimney and blast-pipe maximizing steam production.

At Stoke Bank it has its chance. The ride through Grantham has been slow due to track maintenance, but it has reached Stoke Summit at 75 mph and accelerates now over a long downhill stretch. The speeds at the end of each mile from the summit were recorded as: 87½, 96½, 104, 107, 111½, 116 and 119 mph the subsequent half-mile readings then gave 120¾, 122½, 123, 124¼.<sup>3</sup> And so Joe Duddington, aged 61, an Englishman based in Doncaster, employed by the London and North Eastern Railway since its formation in 1921, and Mallard's driver that day, pushed her on a little as she thundered past the Lincolnshire village of Little Bytham. 'She just jumped to life like a live thing!' he would recall a few years later. 'Folks in the [dynamometer] car held their breath.' The train achieved a top speed of 125.88 miles per hour, a steam record that stands to this day.

Time passed. Seventy five years later, a great gathering of 90 old-timers gathered at the National Railway Museum in York to talk of crewing the Mallard and manning the sheds, and to tour another great gathering in the main hall, all six of the surviving A4 streamliners (of 35 built), huge and gleaming, a product of England: Mallard, Dominion of Canada, Bittern, Union of South Africa, Sir Nigel Gresley and Dwight D Eisenhower. They were all wonderful engines, but the Mallard had the celebrity status - the fastest, the only one purchasable in 130 parts, its creator's favourite - and it did seem to glow more than others, the way Marilyn Monroe or Cary Grant used to. And like movie stars, adults who should know better sighed in the train's presence, as if they weren't worthy, as if the train was of a different and higher species. Iron and man-made as it was, it was also a deity, shining huge above us. I queued up to

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<sup>3</sup> At that very moment, the world record set by a steam train was still 124.5 mph, recorded two years earlier on a run between Hamburg and Berlin. The passengers on board, triumphant in their achievement, included Reinhard Heydrich and Heinrich Himmler. Hitler would hear of the news directly from Joseph Goebbels, who had drawn up the passenger list. The achievement was a victory not just for German engineering, but for Nazi supremacy.

step on its boiler plate, and I would have put on overalls and cap and begun shoveling coal if they'd have let me. Trains, and steam trains in particular, serve as the holding pen for deep male longing. For a person over 70, the notion of 'times past' usually invokes foggy stations and whistles and the presence of grime. A great hall with men dragging tired wives around, lots of plastic bags with lots of souvenirs - it could only be childhood revisited at a railway museum; the French would have locked you away for such nostalgia.

I specifically went to hear one of the old-timers, a man named Alf Smith. Smith was 92, funny and direct, the fireman (coal shoveling and oiler) on the boiler plate of Mallard for almost four years, and 'I never had a bad day, never had a bad day'. He spoke of his driver and his train with deep respect, telling a story of how, when the pair were lodging overnight and came down for their cooked breakfast, his driver would scrape three-quarters of his meal from his plate and give it to him. 'Not once, not twice, but everyday that we was there, that's what he done. I said to him, "Joe, what are you doing?". He said, "I can get home on a bloody egg, you've got the work to do - eat it!" Mallard was part of our story. Well, it *was* our story. That was my engine.' His engine was being mobbed downstairs as he spoke. In the shop, the train was basking in the glory of an anniversary, which meant posters and magnets on sale, and small tins of Garter Blue paint suitable for modeling.

Speed records on trains tend to be maintained for a long time: you push the absolute limit for a few miles, and then safety concerns or a basic lack of ambition seals the record shut for decades. The London to Aberdeen run, for example, took 8 hours 40 minutes in 1895 and didn't get any faster for 80 years. In the mid-1930s it took about 2 hours 20 minutes from London to Liverpool, and we have shaved barely 15 minutes from this. But in the 21<sup>st</sup> Century the train is once more beholden to records and speed. The birthplace of the railways has come relatively late to this party; HS2, the first phase of which is due to open in 2026, will cut the journey between London and Birmingham from 1hour 24 minutes to just 49 minutes.

Elsewhere in the world, progress has been faster. In Spain in 2010, the 205 mph AVE S-112, a train shaped like and nicknamed The Duck, cut the time it takes to get from Madrid to Valencia by more than two hours, to 1 hour 50 minutes. In the same year, travellers between St Petersburg and Helsinki managed the cross-border trip in 3 hours 30 minutes, two hours faster than before the Sm6 Allegro arrived from its works in Italy. In China, the CRH380, new in 2011, travelled at 186mph to cut the journey from Beijing to Shanghai to less than half the journey time in 2010: from 10 hours to 4 hours 45 minutes. And with a certain inevitability Japan has gone a little faster than everyone: in April 2015, on a test track near Mount Fuji, its Maglev ('magnetic levitation') train, hovering 10cm above the track, carried 49 passengers at a speed of 374 mph, smoothly outgunning the French TGV. It is expected to open in 2027 between Tokyo and Nagoya, a journey of 165 miles that it should manage in 40 minutes, half the time of the current Shinkansen bullet train.

But for the most extraordinary advance of all we need to go back to the birth of the *idea* of the train, and a sooty dawn in pre-Victorian north-west England.

## **ii) Was Ever Tyranny More Monstrous?**

On the day it opened in 1830, The Liverpool and Manchester Railway revolutionized the way we thought about our lives. The fact that it linked the thriving cotton mills to a major shipping port about 30 miles away is almost incidental. The steam engine both shrunk and expanded the world; it enhanced trade; it hastened the spread of ideas; it fired global industry. And more than any other invention - save the clock itself and possibly the space rocket - the railways changed our appreciation of time.

The train wasn't like the computer: its early champions knew fairly well what they were unleashing on the world. Proposing the idea of the Liverpool and Manchester line to prospective backers and nervous crowds in the late-1820s (people thought their lungs would collapse, that cows

would fail to milk, that the countryside would be set alight), the line's secretary and treasurer Henry Booth spoke of how the passenger journey time between the cities, previously only possible by horse-drawn coach over turnpike roads, would be cut in half.<sup>4</sup> 'The man of business in Manchester will breakfast at home,' Booth predicted, 'proceed to Liverpool by the railway, transact his business, and return to Manchester before dinner.' (In 1830, dinner was at lunchtime.) Booth, a man who should be more remembered than he is, foretold the impact of the railway far more eloquently than the Stephensons or Brunel. The railway, he correctly suggested, changed 'our value of time'. 'Our amended estimate of the occupation of an hour, or a day' would affect 'the duration of life itself'. Or, as Victor Hugo would later claim, 'All the armies in the world are not so powerful as an idea whose time has come.'<sup>5</sup>

The Liverpool and Manchester railway was the biggest mechanized engineering project the world had seen. It was, of course, at that time also the fastest railway in the world, covering the 31 miles in around 2 hours and 25 minutes.<sup>6</sup> Within a few years of its opening there were accidents all over the country, but also a huge sense of industrial adventure and release: the destiny of the world's economies was now hurtling on iron wheels, and the minute-hand had found its vital and indispensable purpose.

British steam engines were being shipped throughout the world. In February 1832 a new publication called the *American Rail-Road Journal* carried news of a rail alongside the Erie and Hudson canal, and plans for imminent openings in New Jersey, Massachusetts, Pennsylvania and

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4 Seasonably unreliable canals, the other slow method of transport at the birth of the railways, were principally for freight.

5 Paraphrased translation from *Histoire d'un Crime*, 1877.

6 The actual journey on the opening day, 15 September 1830, attended by the Duke of Wellington and other dignitaries, took a little longer, owing to the fatal accident to William Huskisson, MP for Liverpool and a great local supporter of the new railway, a frail man who failed to gauge the time it would take for *Rocket* to travel up the track to where he was standing, and was struck by it as passengers milled around on the track as the engines took on water mid-way in the journey. Oh the symbolism of progress! At the time it was an easy mistake to make.

Virginia. Passenger railways opened in France in 1832, Ireland in 1834, Germany and Belgium in 1835, and Cuba in 1837. In 1846 the whole of Britain was being dug up or drilled through or laid upon: there were 272 railway acts that year.

With the openings came another innovation - the passenger timetable. In January 1831, the Liverpool and Manchester Railway dared list only its departure times, although its journey time was shortening. The company now hoped that the trip between the cities 'is usually accomplished by the First Class carriages [in] under two hours'. The first class coaches did indeed seem to travel faster - more coal, perhaps a more efficient engine - - and there were two distinct schedules: First class, costing 5 shillings each way, ran at 7am, 10am, 1pm and 4.30pm, with late departures for Manchester tradesman at 5.30 on Tuesdays and Saturdays; second class, costing 3 shillings and sixpence, left at 8am and 2.30pm.

But what happened if you wished to travel further afield, perhaps from Lancashire to Birmingham or London? This was already possible by the late-1830s, although the competing rail companies - the Grand Junction Railway running north-west from the midlands, the London and Birmingham Railway, the Leeds and Selby Railway, the York and North Midland Railway - failed to coordinate its schedules to oblige a passenger keen to use more than one line in a day.

The first popular railway timetable combining several lines appeared in 1839, but carried an inbuilt flaw: clocks throughout Great Britain were not synchronized. Before the railway network few saw the need. If the clocks in Oxford ran 5 minutes and two seconds behind London time, or those in Bristol 10 minutes behind, and those in Exeter 14 minutes behind (this was indeed the case with all three westward cities in the 1830s, each enjoying a later sunrise and sunset than London) it was simply a matter of adjusting your timepiece when you arrived.<sup>7</sup> The clock at the town hall or main church tended to be the master timekeeper for the local community, the time still

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<sup>7</sup> The disparity was evident northwards of London too: Leeds was 6 minutes and 10 seconds behind London; Carnforth was 11 minutes and 5 seconds behind; Barrow was 12 minutes and 54 seconds.



set according to the midday sun; a relatively static populace cared little for the time elsewhere in the country so long as their own local timepieces ran at the same time. If road or waterway journeys were undertaken, the time differences would either be adjusted en route (some coaching companies provided adjustment lists), or be judged to be commensurate with the unreliability of a traveller's pocket-watch or carriage clock. But with railways, a new time consciousness affected all who traveled: the concept of 'punctuality' was born anew.

Passengers who prided themselves on the accuracy of their watches (and as the century grew on, there were many more of these) were joined by an entirely new watch-owning class - railwaymen. Neither would be satisfied with what they saw as unnecessary wrinkles in precision. If railway station clocks were left unsynchronized, composite and comparable timetables between destination and arrival points would not only cause confusion and frustration, but would be increasingly impossible and dangerous to maintain. As railways filled the countryside, a driver's watch at variance with another's would almost certainly end in collision. And then a year later, a solution was found, at least in Britain. For the first time, timekeeping achieved nationwide standardization: the railways began to imprint its own clock upon the world.

In November 1840 the Great Western Railway was the first to adopt the idea that time along its route should be the same no matter where a passenger alighted or departed. This task was made possible with the advent of the electric telegraph the year before, with time signals from Greenwich being sent directly along trackside wires. 'Railway Time' thus regulated itself with 'London Time', and by 1847, it was running on the North Western Railway (where its greatest champion was Henry Booth), the [London and South Western](#), the [Lancaster and Carlisle](#), South Eastern, Caledonian, the [Midland](#) and the [East Lancashire](#) lines.

There were other maverick champions too. In 1842, Abraham Follett Osler, a glassmaker and meteorologist from Birmingham, believed so strongly in the establishment of standardized time beyond the railways

that he took matters into his own hands. Having raised funds for the erection of a new clock outside the Birmingham Philosophical Institution, he proceeded one evening to change its time from local to London time (moving it 7 minutes and 15 seconds forward). People noticed, but they also admired the clock's accuracy; within the course of a year, local churches and shopkeepers changed their time to match it.

By mid-century, about 90 per cent of Britain's railways were running London time, although the regulation met a little local opposition. Many city officials objected to *any* interference from London, and showed their disapproval by maintaining clocks with two minute hands - the later one usually denoting their local, older time. In an article titled 'Railway-time Aggression', a correspondent in *Chambers's Edinburgh Journal* in 1851 offered comical disgust: 'Time, our best and dearest possession, is in danger. [Inhabitants were] now obliged, in many of our British towns and villages, to bend before the will of a vapour, and to hasten on his pace in obedience to the laws of a railway company! Was ever tyranny more monstrous or more unbearable than this?' The writer backs his disdain with many examples, including a dinner party and a wedding both ruined as a result of time discrepancies, before rallying the readership: 'Is it possible that this monster evil, with its insidious promises of good and its sure harvest of evil, will be tolerated by freeborn Englishmen? Surely not! Let us rather rally round Old Time with the determination to agitate, and, if needs be, to resist this arbitrary aggression. Let our rallying cry be "The Sun or the Railway!" Englishmen! Beware of delay in opposing this dangerous innovation! No time is to be lost - "Awake, arise, or be forever fallen!" '

Railway Time could kill you just by being there. In 1868, one Dr Alfred Haviland, an epidemiologist and author of the guide *Scarborough as a Health Resort*, published *Hurried To Death: or, A Few Words of Advice on the Danger of Hurry and Excitement Especially Addressed To Railway Passengers*, in which, in fairly breathless prose, he warned of the risks of over-studying of a train timetable and running to catch a departure, and being overly concerned with the era's new schedules. His evidence, which

managed to be both conclusive and dubious, centered on research suggesting that those who ventured regularly on the Brighton to London line aged faster than those who didn't.

The new pressure of time was the cause of some amusement. In 1862, the *Railway Traveller's Handy Book*, an indispensable guide to what to wear and how to comport oneself on the rails, and how to behave when going through a tunnel, contained a passage about the inexperienced traveller running to catch a train with time to spare: 'About five minutes before a train starts, a bell is rung as a signal to passengers to prepare for starting. Persons unaccustomed to travel by railway connect the ringing of the bell with the instant departure of the train, and it is most amusing to watch the novices running helter-skelter along the platform, tumbling over everything and everybody in their eagerness to catch the train which they believe is about to go without them.' Those who travelled often, on the other hand, would use the bell as a signal to stand 'by the carriage door coolly surveying the panic-stricken multitude...'<sup>8</sup>

The final unifying stroke came in 1880, with the passage in parliament of the Statutes (Definition of Time) Act. It was now a public order offence to knowingly display the wrong time on municipal buildings. But beyond Great Britain, time ran on different tracks. France, a nation that had embraced the railways later than many of its European neighbours, found a way to adapt its traditionally perverse attitude to time to its new transport. While most stations adopted Paris time for their schedules and external clocks, clocks within station buildings consistently and deliberately ran five minutes early to ease the pressure on passengers who might arrive late (this lasted from about 1840 to 1880; regular passengers,

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<sup>8</sup> For some, the helter-skelter of railways represented merely one more unwelcome intrusion of the fast modern world. 'What with railways, steamships, printing-presses it has surely become a most *monstrous* "tissue" this life of ours,' Thomas Carlyle wrote from London to Ralph Waldo Emerson in America in 1835. He was horrified at 'the roaring Loom of Time', a reference was to Goethe's *Faust*. The printing-press, it should be acknowledged, was by then 300 years old, and one wonders where the two authors would have been without it.

of course, grew wise to the ruse and adjusted their own scheduling accordingly, a nice display of *laissez faire*). In Germany the railways seemed to shrink time, as if a magical invention. When the theologian David Friedrich Strauss travelled from Heidelberg to Mannheim in the late-1840s he marveled at a journey that took 'half an hour instead of five hours'. In 1850 the Ludwigs Railroad company shrunk time even more, advertising a trip from Nuremberg to Fürth, travelling 'one and a half hours in ten minutes'. In his 'History of the Hour', the German theologian Gerhard Dohrn-van Rossum notices persistent contemporary references to the railways causing 'the destruction of space and time' and 'the emancipation from nature'. As with Henry Booth in Liverpool, travellers cutting through mountains and spanning valleys estimated that the eradication of these obstacles practically doubled their lifespans. The imagination accelerated all possibilities.

The character of the nation, the *volksgeist*, determined that the trains not only consistently ran according to schedule but were shown to do so by station clocks synchronised from Berlin. But the acceptance of the transformation from 'external' local time to 'internal' railway time took more than fifty years. Germany was unified by railway time only in 1890s, but it was political and military expediency, rather than a concern for the passenger, that forced the move. In 1891, Field Marshal Helmuth von Moltke, who had employed the railways effectively in his military campaigns in France, spoke in the Reichstag of the need for one clock throughout the country. The railways facilitated the greatest single improvement the military had encountered in his lifetime - enabling him to amass 430,000 men in four weeks - but there was a dilemma to be overcome. 'Gentlemen, in Germany we have five different time zones. In north Germany, including Saxony, we use Berlin time; in Bavaria, Munich time; in Würtemberg, Stuttgart time; in Baden, Karlsruhe time; and in the Rhenish Palatinate, Ludwigshafen time. All the inconveniences and disadvantages which we dread encountering on the French and Russian frontiers, we experience today in our own country. This is, I may say, a ruin which has been left

standing, a relic of the time of German disruption – a ruin which, now that we have become an Empire, should be completely erased.’ And thus did Germany adopt the precision of Greenwich.<sup>9</sup>

But it was on the vast continent of North America that the issue of a standard time faced its greatest challenge. Even in the early 1870s, an American rail traveller would have to be confident indeed, for the station clocks offered 49 different times from east to west. It was noon in Chicago, but 12.31 in Pittsburgh. The issue assumed particular urgency after 1853, when irregular timekeeping caused several railway fatalities (it didn’t help that trains usually travelled in both directions on a single track).

A set of timekeeping instructions issued in August 1853 by W Raymond Lee, the superintendent on the Boston and Providence Railroad, laid bare the complexities, and the

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9 Or as the proclamation in the Reichstag stated, ‘The legal time in Germany is the solar mean time of the fifteenth degree latitude east of Greenwich.’ But why Greenwich? How did a modest observatory on the edge of the Thames come to define the ‘point zero’ for an empire’s timekeeping and a precise Universal Time for the world? The story begins with the observatory’s ambitious mapping of the heavens at the end of the 17<sup>th</sup> century, and gathers pace with the Longitude Act of 1714, which awarded prizes for precision navigation and established Greenwich’s location as the point of the zero-longitude meridian. The reliability of the observatory’s stargazing soon transferred to its pendulum clocks and smaller chronometers, and this in turn encouraged London’s watchmakers to call at Greenwich for accurate daily or weekly readings. It worked the other way too: for several generations members of the enterprising Belville family would set out from Greenwich with a series of accurate pocket watches and receive payment for hand-delivering the time to those whose livelihoods relied on it, not least grateful railway officials. From 1833 ships in the nearby East India Docks took accurate readings for their chronometers from the metal ball that descended from a 15-foot mast on the observatory roof at precisely 1pm.

A quick stroll around the Royal Observatory today engulfs the visitor with a sense of immense security. The place is a custodian of mechanized temporal supremacy over sea, rail, industry and trade, and the items on display show the development of John Harrison’s famous ‘H’ series of timepieces from the 18<sup>th</sup> century that successfully enabled ships to calculate their longitudinal location at sea.

propensity for human error. In part, it read like a Marx Brothers script: 'Standard Time is two minutes later than Bond & Sons' clock, No 17 Congress Street, Boston' the first of these began. 'The Ticket Clerk, Boston Station, and the Ticket Clerk, Providence Station, are charged with the duty of regulating Station Time. The former will daily compare it with Standard Time, and the latter will daily compare it with Conductor's Time; and the agreement of any two Conductors upon a variation in Station Time shall justify him in changing it.'<sup>10</sup>

And so the call went out to on an unlikely group of specialists. American astronomers had long argued that their observatory time was the most accurate available, and they were now required to set station clocks wherever possible (taking over from town clocks and jeweler's windows as the custodians of reliability). Around 20 astronomical institutions administered time to the railways in the 1880s, with the US Naval Observatory taking the lead.

Apart from the astronomers, one figure stands out. A railway engineer named William F Allen was permanent secretary of the General Time Convention, and had long seen the advantages of a universal time system. At a meeting in the spring of 1883 he had laid out two maps before the assembled officials that seemed to establish his case beyond doubt. One was a forest of colours showing almost fifty lines, as if scribbled by an angry child, and the other was a smooth display of four broad colour-bars, running north to south, each fifteen degrees of longitude apart. Allen claimed that the new map carried all 'the enlightenment we hope for in the future'.<sup>11</sup> Allen was proposing a remarkable thing: that his continent's timekeeping be based not on its national meridian, but on a meridian beyond its borders, and upon signals received

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10 Parallel tracks: In the 21<sup>st</sup> century, the lines of ultra-fast fibre-optic cables used for high-frequency trading between, for example, stock exchanges and traders in New York and Chicago, followed the telegraph laid down by the railways some 150 years before.

11 He was building on the maverick ideas of Professor C F Dowd, the principal of Temple Grove Seminary for Young Ladies in Saratoga, New York, who first suggested separating the continent into four or more 'time belts'.

by electric telegraph from the Royal Observatory at Greenwich.<sup>12</sup>

In the summer of 1883, Allen sent maps and details of his proposals to 570 railway company managers, and gained approval from the vast majority; he then supplied them with 'translation tables', to convert local time to standard. And so the familiar era of public timekeeping began at noon on Sunday 18 November 1883, and the 49 previous time zones were reduced to four. Observing the transition from the Western Union Building in New York City, Allen noted, 'the bells of St Paul's strike on the old time. Four minutes later, obedient to the electrical signal from The Naval Observatory ... local time was abandoned, probably forever.'

As in Europe, the railways' strictures gradually spread to the locale in which they operated, and adherence to the timetable on the tracks dispersed to all aspects of daily life. But, as in Europe, not every city delighted in the imposition of uniformity. Pittsburgh banned standard time until 1887, while Augusta and Savannah resisted until 1888. In Ohio, members of the Bellaire school board voted to adopt standard time and were promptly arrested on the orders of the city council. Detroit protested louder than most: although strictly part of the Central time zone, the city maintained local time (28 minutes behind Standard Time) until 1900. Henry Ford, who trained as a watch repairer before he revolutionised the car business, made and sold a watch that told both standard and local time simultaneously, and both remained in use until 1918.<sup>13</sup>

Towards the end of 1883, the *Indianapolis Centennial* noted that in the ultimate quarrel between man and nature, man had finally and irrevocably pulled ahead: 'The sun is no longer to boss the job...The sun will be requested to rise and set by railroad time.' At the heart of the

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12 Before this standardization, the first message transmitted telegraphically some forty miles along the Baltimore to Washington line was 'What hath God wrought!'

13 No such delineations in Russia, though: throughout the construction of the Trans-Siberian Railway between 1891 and 1916, and despite the great distances involved, the route ran entirely on Moscow's civil time. The route now spans seven time zones across an eight-day journey.

newspaper's distaste for this new system lay the diminishing role of the church and its bells calling congregants to prayer (and in effect the whole God-given scheme of things). 'The planets must, in the future, make their circuits by such timetables as railroad magnates arrange...People will have to marry by railroad time.'<sup>14</sup> A reporter in Cincinnati observed that 'the longer a man is a commuter the more he grows to be a living timetable.'

The word 'commuter' was brand new (one who 'commuted' or shortened their journey). But the notion of the railway timetable, novel at the launch of the Liverpool and Manchester line in 1830, was by now ingrained in the soul.<sup>15</sup> The first international railway timetable conference took place in Cologne in February 1872. Representatives from Austria, France, Belgium and Switzerland joined delegates from a newly unified Germany. The debate was both a simple and a complicated one: how to coordinate trains running across international borders to facilitate smooth travelling for the passenger and freight and an efficient service by the operators? And then how to advertise this service in a way that would encourage and simplify this procedure? One of the most important agreements was how the timetable would be represented visually: it was decided to use roman numerals based on the 12-hour format. The conferences increased in number and productivity each year: the founding members were soon joined by Hungary, the Netherlands, Spain, Poland and Portugal, and the standardization of time from London ensured that passengers increasingly made the right connections. The meetings were held twice a year, for

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14 Quoted in Jack Beatty, *Age of Betrayal: The Triumph of Money in America 1865-1900* by Jack Beatty (Vintage) and in Ian R Bartky, *Selling The True Time: Nineteenth-Century Timekeeping in America* (Stanford University Press, 2000). The latter is especially comprehensive, and has been a useful source for the American details in this chapter.

15 Those within even touching distance of railway fanaticism, and admirers of Michael Portillo (more now than there used to be), will be aware of Bradshaw's, the guide that began in England as a pocket-sized timetable in 1839 and soon expanded into a UK railway atlas, a traveller's guide and a European handbook. It was both infinitely useful and highly accurate, and its popularity obliged railway companies to run punctual trains; the printed timetable dictating the service rather than the other way around.



summer and winter timetables, until the First World War brought cooperation and, in many cases, cross-border travel to an end. (War undid much that was noble about the railways; their potential facilitated modern warfare. The Duke of Wellington would surely have recognized their worth; as of course did Mussolini.<sup>16</sup>)

It won't be so long before the train shifts its symbolic wherewithal from a model of speed and alarm to a model of sedateness; we shall soon see the car overtake it as the emblem of speed and stress. But first let us travel back to other tracks and tempos, and to charming old Austria, where a man with crazy hair is about to conduct a nervous orchestra.

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<sup>16</sup> Many eyewitness accounts suggest punctual fascist trains were a myth, but there can be no doubting the hitherto unavailable possibilities of synchronised troop movements.