CHARLES ADAMS

NOTES ON RAILROAD ACCIDENTS

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Adams C.

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Содержание

Charles Francis Adams
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PREFACE

This volume makes no pretence whatever of being either an exhaustive or a scientific study of the subject to which it relates. It is, on the contrary, merely what its title signifies, – a collection of notes on railroad accidents. In the course of ten years service as one of the railroad commissioners of Massachusetts, I was called upon officially to investigate two very serious disasters, – that at Revere in 1871, and that at Wollaston in 1878, – besides many others less memorable. In connection with these official duties I got together by degrees a considerable body of information, which I was obliged to extract as best I could from newspapers and other contemporaneous sources. I have felt the utmost hesitation in publishing so crude and imperfect a performance, but finally decide to do so for the reason that, so far as I know, there is nothing relating to this subject in print in an accessible form, and it would, therefore, seem that these notes may have a temporary value.

During my term of public service, also, there have been four appliances, either introduced into use or now struggling for American recognition, my sense of the value of which, in connection with the railroad system, to both the traveling and general public, I could not easily overstate. These appliances are the Miller Platform and Buffer, the Westinghouse Brake, and the Interlocking and Electric Signal Systems. To bring these into more general use through reports on railroad accidents as they occurred was one great aim with me throughout my official life. I am now not without hopes that the printing of this volume may tend to still further familiarize the public with these inventions, and thus hasten their more general adoption.

C. F. A. Jr.

Quincy, October 1, 1879.

NOTES ON RAILROAD ACCIDENTS

It is a melancholy fact that there are few things of which either nature or man is, as a rule, more lavish than human life; – provided always that the methods used in extinguishing it are customary and not unduly obtrusive on the sight and nerves. As a necessary consequence of this wastefulness, it follows also that the results which ordinarily flow from the extinguishment of the individual life are pitiably small. Any person curious to satisfy himself as to the truth of either or both of these propositions can do so easily enough by visiting those frequent haunts in which poverty and typhoid lurk in company; or yet more easily by a careful study of the weekly bills of mortality of any great city. Indeed, compared with the massive battalions daily sacrificed in the perpetual conflict which mankind seems forever doomed to wage against intemperance, bad sewerage and worse ventilation, the victims of regular warfare by sea and land count as but single spies. The worst of it is, too, that if the blood of the martyrs thus profusely spilled is at all the seed of the church, it is a seed terribly slow of germination. Each step in the slow progress is a Golgotha.

In the case of railroad disasters, however, a striking exception is afforded to this rule. The victims of these, at least, do not lose their lives without great and immediate compensating benefits to mankind. After each new "horror," as it is called, the whole world travels with an appreciable increase of safety. Both by public opinion and the courts of law the companies are held to a most rigid responsibility. The causes which led to the disaster are anxiously investigated by ingenious men, new appliances are invented, new precautions are imposed, a greater and more watchful care is inculcated.

And hence it has resulted that each year, and in obvious consequence of each fresh catastrophe, travel by rail has become safer and safer, until it has been said, and with no inconsiderable degree of truth too, that the very safest place into which a man can put himself is the inside of a first-class railroad carriage on a train in full motion.

The study of railroad accidents is, therefore, the furthest possible from being a useless one, and a record of them is hardly less instructive than interesting. If carried too far it is apt, as matter for light reading, to become somewhat monotonous; though, none the less, about these, as about everything else, there is an almost endless variety. Even in the forms of sudden death on the rail, nature seems to take a grim delight in an infinitude of surprises.

CHAPTER I.
THE DEATH OF MR. HUSKISSON

With a true dramatic propriety, the ghastly record, which has since grown so long, began with the opening of the first railroad, – literally on the very morning which finally ushered the great system into existence as a successfully accomplished fact, the eventful 15th of September, 1830, – the day upon which the Manchester & Liverpool railroad was formally opened. That opening was a great affair. A brilliant party, consisting of the directors of the new enterprise and their invited guests, was to pass over the road from Liverpool to Manchester, dine at the latter place and return to Liverpool in the afternoon. Their number was large and they filled eight trains of carriages, drawn by as many locomotives. The Duke of Wellington, then prime minister, was the most prominent personage there, and he with his party occupied the state car, which was drawn by the locomotive *Northumbrian*, upon which George Stephenson himself that day officiated as engineer. The road was laid with double tracks, and the eight trains proceeded in two parallel columns, running side by side and then again passing or falling behind each other. The Duke's train gaily led the race, while in a car of one of the succeeding trains was Mr. William Huskisson, then a member of Parliament for Liverpool and eminent among the more prominent public men of the day as a financier and economist. He had been very active in promoting the construction of the Manchester & Liverpool road, and now that it was completed he had exerted himself greatly to make its opening a success worthy an enterprise the far-reaching consequences of which he was among the few to appreciate. All the trains had started promptly from Liverpool, and had proceeded through a continued ovation until at eleven o'clock they had reached Parkside, seventeen miles upon their journey, where it had been arranged that the locomotives were to replenish their supplies of water. As soon as the trains had stopped, disregarding every caution against their so doing, the excited and joyous passengers left their carriages and mingled together, eagerly congratulating one another upon the unalloyed success of the occasion. Mr. Huskisson, though in poor health and somewhat lame, was one of the most excited of the throng, and among the first to thus expose himself. Presently he caught the eye of the Duke of Wellington, standing at the door of his carriage. Now it so happened that for some time previous a coolness had existed between the two public men, the Duke having as premier, with the military curtness for which he was famed, dismissed Mr. Huskisson from the cabinet of which he had been a member, without, as was generally considered, any sufficient cause, and in much the same way that he might have sent to the right-about some member of his staff whose performance of his duty was not satisfactory to him. There had in fact been a most noticeable absence of courtesy in that ministerial crisis. The two now met face to face for the first time since the breach between them had taken place, and the Duke's manner evinced a disposition to be conciliatory, which was by no means usual with that austere soldier. Mr. Huskisson at once responded to the overture, and, going up to the door of the state carriage, he and his former chief shook hands and then entered into conversation. As they were talking, the Duke seated in his car and Mr. Huskisson standing between the tracks, the *Rocket* locomotive – the same famous *Rocket* which a year previous had won the five hundred pounds prize, and by so doing established forever the feasibility of rapid steam locomotion – came along upon the other track to take its place at the watering station. It came up slowly and so silently that its approach was hardly noticed; until, suddenly, an alarm was given, and, as every one immediately ran to resume his place, some commotion naturally ensued. In addition to being lame, Mr. Huskisson seemed also under these circumstances to be quite agitated, and, instead of quietly standing against the side of the carriage and allowing the *Rocket* to pass, he nervously tried to get around the open carriage door, which was swinging out across the space between the two tracks in such a way that the approaching locomotive struck it, flinging it back and at the same time throwing Mr. Huskisson down. He fell

on his face in the open space between the tracks, but with his left leg over the inner of the two rails upon which the *Rocket* was moving, so that one of its wheels ran obliquely up the limb to the thigh, crushing it shockingly. As if to render the distressing circumstances of the catastrophe complete, it so happened that the unfortunate man had left his wife's side when he got out of his carriage, and now he had been flung down before her eyes as he sought to reënter it. He was immediately raised, but he knew that his hurt was mortal and his first exclamation was, "I have met my death!" He was at once placed on one of the state carriages, to which the *Northumbrian* locomotive was attached, and in twenty-five minutes was carried to Eccles, a distance of seventeen miles, where medical assistance was obtained. He was far beyond its reach, however, and upon the evening of the same day, before his companions of the morning had completed their journey, he was dead. Some time after this accident a great public dinner was given at Liverpool in honor of the new enterprise. Brougham was then at the height of an unbounded popularity and just taking the fatal step of his life, which led him out of the House of Commons to the wool-sack and the Lords. Among the excursionists of the opening day he had on the 16th, occasion to write a brief note to Macvey Napier, editor of the *Edinburgh Review*, in which he thus alluded to the fatal accident which had marred its pleasure: – "I have come to Liverpool only to see a tragedy. Poor Huskisson is dead, or must die before to-morrow. He has been killed by a steam carriage. The folly of seven hundred people going fifteen miles an hour, in six carriages, exceeds belief. But they have paid a dear price." He was one of the guests at the subsequent dinner, and made a speech in which there was one passage of such exquisite oratorical skill, that to read it is still a pleasure. In it he at once referred to the wonders of the system just inaugurated, and to the catastrophe which had saddened its opening observances. "When," he said, "I saw the difficulties of space, as it were, overcome; when I beheld a kind of miracle exhibited before my astonished eyes; when I saw the rocks excavated and the gigantic power of man penetrating through miles of the solid mass, and gaining a great, a lasting, an almost perennial conquest over the powers of nature by his skill and industry; when I contemplated all this, was it possible for me to avoid the reflections which crowded into my mind, not in praise of man's great success, not in admiration of the genius and perseverance he had displayed, or even of the courage he had shown in setting himself against the obstacles that matter afforded to his course – no! but the melancholy reflection, that these prodigious efforts of the human race, so fruitful of praise but so much more fruitful of lasting blessings to mankind, have forced a tear from my eye by that unhappy casualty which deprived me of a friend and you of a representative!"

Though wholly attributable to his own carelessness, the death of so prominent a character as Mr. Huskisson, on such an occasion, could not but make a deep impression on the public mind. The fact that the dying man was carried seventeen miles in twenty-five minutes in search of rest and medical aid, served rather to stimulate the vague apprehension which thereafter for a time associated itself with the new means of transportation, and converted it into a dangerous method of carriage which called for no inconsiderable display of nerve on the part of those using it. Indeed, as respects the safety of travel by rail there is an edifying similarity between the impressions which prevailed in England forty-five years ago and those which prevail in China now; for, when as recently as 1875 it was proposed to introduce railroads into the Celestial Empire, a vigorous native protest was fulminated against them, in which, among other things scarcely less astounding, it was alleged that "in all countries where railroads exist they are considered a very dangerous mode of locomotion, and, beyond those who have very urgent business to transact, no one thinks of using them."

On this subject, however, of the dangers incident to journeys by rail, a writer of nearly half a century back, who has left us one of the earliest descriptions of the Manchester & Liverpool road, thus reassured the public of those days, with a fresh quaintness of style which lends a present value to his words: "The occurrence of accidents is not so frequent as might be imagined, as the great weight of the carriages" (they weighed about one-tenth part as much as those now in use in America) "prevents them from easily starting off the rails; and so great is the momentum acquired by these

heavy loads moving with such rapidity, that they easily pass over considerable obstacles. Even in those melancholy accidents where loss of life has been sustained, the bodies of the unfortunate sufferers, though run over by the wheels, have caused little irregularity in the motion, and the passengers in the carriages have not been sensible that any impediment has been encountered on the road."

Indeed, from the time of Mr. Huskisson's death, during a period of over eleven years, railroads enjoyed a remarkable and most fortunate exemption from accidents. During all that time there did not occur a single disaster resulting in any considerable loss of life; an immunity which seems to have been due to a variety of causes. Those early roads were, in the first place, remarkably well and thoroughly built, and were very cautiously operated under a light volume of traffic. The precautions then taken and the appliances in use would, it is true, strike the modern railroad superintendent as both primitive and comical; for instance, they involved the running of independent pilot locomotives in advance of all night passenger trains. Through all the years between 1830 and 1841, nevertheless, not a single really serious railroad disaster had to be recorded. This happy exemption was, however, quite as much due to good fortune as to anything else, as was well illustrated in the first accident at all serious in its character, which occurred, – an accident in its every circumstance, except loss of life, almost an exact parallel to the famous Revere disaster which happened nearly forty years later in Massachusetts. It chanced on the Manchester & Liverpool Railway on December 23, 1832. The second-class morning train had stopped at the Rainhill station to take in passengers, when those upon it heard through the dense fog another train, which had left Manchester forty-five minutes later, coming towards them at a high rate of speed. When it first became visible it was but one hundred and fifty yards off, and a collision was inevitable. Those in charge of the stationary train, however, succeeded in getting it under a slight headway, and in so much diminished the shock of the collision; but, notwithstanding, the last five carriages were injured, the one at the end being totally demolished. Though quite a number of the passengers were cut and bruised, and several were severely hurt, one only, strange to say, was killed.

Indeed, the luck – for it was nothing else – of those earlier times was truly amazing. Thus on this same Manchester & Liverpool road, as a first-class train on the morning of April 17, 1836, was moving at a speed of some thirty miles an hour, an axle broke under the first passenger coach, causing the whole train to leave the track and throwing it down the embankment, which at that point was twenty feet high. The cars were rolled over, and the passengers in them tumbled about topsy-turvey; nor, as they were securely locked in, could they even extricate themselves when at last the wreck of the train reached firm bearings. And yet no one was killed. Here the corporation was saved by one chance in a thousand, and its almost miraculous good fortune has since received numerous and terrible illustrations. Among these two are worthy of a more than passing mention. They happened one in America and one in England, though with some interval of time between them, and are curious as illustrating very forcibly the peculiar dangers to which those travelling by rail in the two countries are subjected under almost precisely similar circumstances. The American accident referred to was that popularly known on account of its exceptionally harrowing details as the "Angola horror," of December 18, 1867, while the English accident was that which occurred at Shipton-on-Cherwell on December 24, 1874.

CHAPTER II.
THE ANGOLA AND SHIPTON ACCIDENTS

On the day of the Angola accident the eastern bound express train over the Lake Shore road, as it was then called, consisted of a locomotive, four baggage, express and mail cars, an emigrant and three first-class passenger coaches. It was timed to pass Angola, a small way station in the extreme western part of New York, at 1.30 P.M., without stopping; but on the day in question it was two hours and forty-five minutes late, and was consequently running rapidly. A third of a mile east of the station there is a shallow stream, known as Big Sister creek, flowing in the bottom of a ravine the western side of which rises abruptly to the level of the track, while on the eastern side there is a gradual ascent of some forty or fifty rods. This ravine was spanned by a deck bridge of 160 feet in length, at the east end of which was an abutment of mason work some fifty feet long connecting with an embankment beyond. It subsequently appeared that the forward axle in the rear truck of the rear car was slightly bent. The defect was not perceptible to the eye, but in turning round the space between the flanges of the wheels of that axle varied by three-fourths of an inch. As long as the car was travelling on an unbroken track, or as long as the wheels did not strike any break in the track at their narrowest point, this slight bend in the axle was of no consequence. There was a frog in the track, however, at a distance of 600 feet east of the Angola station, and it so happened that a wheel of the defective axle struck this frog in such a way as to make it jump the track. The rear car was instantly derailed. From the frog to the bridge was some 1200 feet. With the appliances then in use the train could not be stopped in this space, and the car was dragged along over the ties, swaying violently from side to side. Just before the bridge was reached the car next to the last was also thrown from the track, and in this way, and still moving at considerable speed, the train went onto the bridge. It was nearly across when the last car toppled off and fell on the north side close to the abutment. The car next to the rear, more fortunate, was dragged some 270 feet further, so that when it broke loose it simply slid some thirty feet down the embankment. Though this car was badly wrecked, but a single person in it was killed. His death was a very singular one. Before the car separated from the train, its roof broke in two transversely; through the fissure thus made this unfortunate passenger was partly flung, and it then instantly closed upon him.

The other car had fallen fifty feet, and remained resting on its side against the abutment with one end inclined sharply downward. It was mid-winter and cold, and, as was the custom then, the car was heated by two iron stoves, placed one at each end, in which wood was burned. It was nearly full of passengers. Naturally they all sprang from their seats in terror and confusion as their car left the rails, so that when it fell from the bridge and violently struck on one of its ends, they were precipitated in an inextricable mass upon one of the overturned stoves, while the other fell upon them from above. A position more horrible could hardly be imagined. Few, if any, were probably killed outright. Some probably were suffocated; the greatest number were undoubtedly burned to death. Of those in that car three only escaped; forty-one are supposed to have perished.

This was a case of derailment aggravated by fire. It is safe to say that with the improved appliances since brought into use, it would be most unlikely to now occur under precisely the same circumstances on any well-equipped or carefully operated road. Derailments, of course, by broken axles or wheels are always possible, but the catastrophe at Angola was primarily due to the utter inability of those on the train to stop it, or even greatly to check its speed within any reasonable distance. Before it finally stood still the locomotive was half a mile from the frog and 1,500 feet from the bridge. Thus, when the rear cars were off the track, the speed and distance they were dragged gave them a lateral and violently swinging motion, which led to the final result. Though under similar circumstances now this might not happen, there is no reason why, circumstances being varied a little,

the country should not again during any winter day be shocked by another Angola sacrifice. Certainly, so far as the danger from fire is concerned, it is an alarming fact that it is hardly less in 1879 than it was in 1867. This accumulative horror is, too, one of the distinctive features of American railroad accidents. In other countries holocausts like those at Versailles in 1842 and at Abergele in 1868 have from time to time taken place. They are, however, occasioned in other ways, and, as their occurrence is not regularly challenged by the most risky possible of interior heating apparatus, are comparatively infrequent. The passenger coaches used on this side of the Atlantic, with their light wood-work heavily covered with paint and varnish, are at best but tinder-boxes. The presence in them of stoves, hardly fastened to the floor and filled with burning wood and coal, involves a degree of risk which no one would believe ever could willingly be incurred, but for the fact that it is. No invention yet appears to have wholly met the requirements of the case. That they will be met, and the fearful possibility which now hangs over the head of every traveller by rail, that he may suddenly find himself doomed without possibility of escape to be roasted alive, will be at least greatly reduced hardly admits of question.

Turning now from the American to the English accident, it is singular to note how under very similar circumstances much the same fatality resulted from wholly different causes. It happened on the day immediately preceding Christmas, and every train which at that holiday season leaves London is densely packed, for all England seems then to gather away from its cities to the country hearths. Accordingly, the ten o'clock London express on the Great Western Railway, when it left Oxford that morning, was made up of no less than fifteen passenger carriages and baggage vans, drawn by two powerful locomotives and containing nearly three hundred passengers. About seven miles north of Oxford, as the train, moving at a speed of some thirty to forty miles an hour, was rounding a gentle curve in the approach to the bridge over the little river Cherwell, the tire of one of the wheels of the passenger coach next behind the locomotive broke, throwing it off the track. For a short distance it was dragged along in its place; but almost immediately those in charge of the locomotives noticed that something was wrong, and, most naturally and with the very best of intensions, they instantly did the very worst thing which under the circumstances it was in their power to do, – they applied their brakes and reversed their engines; their single thought was to stop the train. With the train equipped as it was, however, had these men, instead of crowding on their brakes and reversing their engines, simply shut off their steam and by a gentle application of the brakes checked the speed gradually and so as to avoid any strain on the couplings, the carriages would probably have held together and remained upon the road-bed. Instead of this, however, the sudden checking of the two ponderous locomotives converted them into an anvil, as it were, upon which the unfortunate leading carriage already off the rails was crushed under the weight and impetus of those behind it. The train instantly zig-zagged in every direction under the pressure, the couplings which connected it together snapping, and the carriages, after leaving the rails to the right and left and running down the embankment of about thirteen feet in height, came to a stand-still at last, several of them in the reverse order from that which they had held while in the train. The first carriage was run over and completely destroyed; the five rear ones were left alone upon the road-bed, and of these two only were on the rails; of the ten which went down the embankment, two were demolished. In this disaster thirty-four passengers lost their lives, and sixty-five others, besides four employés of the company, were injured.

At the time it occurred the Shipton accident was the subject of a good deal of discussion, and both the brake system and method of car construction in use on English roads were sharply criticised. It was argued, and apparently with much reason, that had the "locomotives and cars been equipped with the continuous train-brakes so generally in use in America, the action of the engine drivers would have checked at the same instant the speed of each particular car, and probably any serious accident would have been averted." Yet it required another disaster, not so fatal as that at Shipton-on-Cherwell but yet sufficiently so, to demonstrate that this was true only in a limited degree, – to further illustrate and enforce the apparently obvious principle that, no matter how heavy the construction may be, or what train-brake is in use, to insure safety the proportion between the resisting strength

of car construction and the train-weight momentum to which it may be subjected must be carefully preserved.

On this point of the resisting power of modern car construction, indeed, it seemed as if a result had been reached which did away with the danger of longitudinal crushing. Between 1873 and 1878 a series of accidents had occurred on the American roads of which little was heard at the time for the simple reason that they involved no loss of life, – they belonged in the great category of possible disasters which might have happened, had they not been prevented. Trains going in opposite directions and at full speed had come in collision while rounding curves; trains had run into earth-slides, and had been suddenly stopped by derailment; in every such case, however, the Westinghouse brake and the Miller car construction had, when in use, proved equal to the emergency and the passengers on the trains had escaped uninjured. The American mechanic had accordingly grown firm in his belief that, so far as any danger from the crushing of cars was concerned, – unless indeed they were violently thrown down an embankment or precipitated into an abyss, – the necessary resisting strength had been secured and the problem practically solved. That such was not the case in America in 1878 any more than in England in 1875, except within certain somewhat narrow limits, was unexpectedly proven by a disaster which occurred at Wollaston near Boston, on the Old Colony road, upon the evening of October 8, 1878.

CHAPTER III.
THE WOLLASTON ACCIDENT

A large party of excursionists were returning from a rowing match on a special train consisting of two locomotives and twenty-one cars. There had been great delay in getting ready for the return, so that when it neared Wollaston the special was much behind the time assigned for it. Meanwhile a regular freight train had left Boston, going south and occupying the outward track. At Wollaston those in charge of this train had occasion to stop for the purpose of taking up some empty freight cars, which were standing on a siding at that place; and to reach this siding it was necessary for them to cross the inward track, temporarily disconnecting it. The freight train happened to be short-handed, and both its conductor and engineer supposed that the special had reached Boston before they had started out. Accordingly, in direct violation of the rules of the road and with a negligence which admitted of no excuse, they disconnected the inward track in both directions and proceeded to occupy it in the work of shunting, without sending out any signals or taking any precautions to protect themselves or any incoming train. It was after dark, and, though the switches were supplied with danger signals, these were obscured by the glare of the locomotive head-light. Under these circumstances the special neared the spot. What ensued was a curious illustration of those narrow escapes through which, by means of improved appliances or by good luck, railroad accidents do not happen; and an equally curious illustration of those trifling derangements which now and again bring them about. In this case there was no collision, though a freight train was occupying the inward track in front of the special. There should have been no derailment, though the track was broken at two points. There would have been no accident, had there been no attempt made to avert one. Seeing the head-light of the approaching special, while yet it was half a mile off, the engineer of the freight train realizing the danger had put on all steam, and succeeded, though by a very narrow margin, in getting his locomotive and all the cars attached to it off of the inward track and onto the outward, out of the way of the special. The inward track was thus clear, though broken at two points. The switches at those points were, however, of the safety pattern, and, if they were left alone and did their work, the special would simply leave the main track and pass into the siding, and there be stopped. Unfortunately the switches were not left alone. The conductor of the freight train had caught sight of the head-light of the approaching locomotive at about the same time as the engineer of that train. He seems at once to have realized the possible consequences of his reckless neglect of precautions, and his one thought was to do something to avert the impending disaster. In a sort of dazed condition, he sprang from the freight car on which he was standing and ran to the lever of the siding switch, which he hastened to throw. He apparently did not have time enough within perhaps five seconds. Had he succeeded in throwing it, the train would have gone on to Boston, those upon it simply knowing from the jar they had received in passing over the first frog that a switch had been set wrong. Had he left it alone, the special would have passed into the siding and there been stopped. As it was, the locomotive of the special struck the castings of the switch just when it was half thrown – at the second when it was set neither the one way nor the other – and the wreck followed. It was literally the turning of a hand.

As it approached the point where the disaster occurred the special train was running at a moderate rate of speed, not probably exceeding twenty miles an hour. The engineer of its leading locomotive also perceived his danger in time to signal it and to reverse his engine while yet 700 feet from the point where derailment took place. The train-brake was necessarily under the control of the engineer of the second locomotive, but the danger signal was immediately obeyed by him, his locomotive reversed and the brake applied. The train was, however, equipped with the ordinary Westinghouse, and not the improved automatic or self-acting brake of that name. That is, it depended for its efficiency on the perfectness of its parts, and, in case the connecting tubes were broken or

the valves deranged, the brake-blocks did not close upon the wheels, as they do under the later improvements made by Westinghouse in his patents, but at best remained only partially set, or in such positions as they were when the parts of the brake were broken. As is perfectly well understood, the original Westinghouse does not work quickly or effectively through more than a certain number of cars. Twelve is generally regarded as the limit of practical simultaneous action. The 700 feet of interval between the point where the brakes were applied and that where the accident occurred, – a distance which, at the rate at which the train was moving, it could hardly have passed over in less than twenty-two seconds, – should have afforded an ample space within which to stop the train. When the derailment took place, however, it was still moving at a considerable rate of speed. Both locomotives, the baggage car and six following passenger cars left the rails. The locomotives, after going a short distance, swung off to the left and toppled over, presenting an insuperable barrier to the direct movement of the cars following.

Those cars were of the most approved form of American construction, but here, as at Shipton, the violent application of the train-brakes and reversal of the locomotives had greatly checked the speed of the forward part of the train, while the whole rear of it, comparatively free from brake pressure, was crowding heavily forward. Including its living freight, the entire weight of the train could not have been less than 500 tons. There was no slack between its parts; no opportunity to give. It was a simple question of the resisting power of car construction. Had the train consisted of ten cars instead of twenty-two a recent experience of a not dissimilar accident on this very road affords sufficient evidence of how different the result would have been. On the occasion referred to, – October 13, 1876, – a train consisting of two locomotives and fourteen cars, while rounding a curve before the Randolph station at a speed of thirty miles an hour came in sudden collision with the locomotive of a freight train which was occupying the track, and while doing so, in that case also as at Wollaston, had wholly neglected to protect it. So short was the notice of danger that the speed of the passenger train could not at the moment of collision have been less than twenty miles an hour. The freight train was at the moment fortunately backing, but none the less it was an impassable obstacle. The three locomotives were entirely thrown from the track and more or less broken up, and three cars of the passenger train followed them, but the rest of it remained in line and on the rails, and was so entirely uninjured that it was not found necessary to withdraw one of the cars from service for even a single trip. Not a passenger was hurt. This train consisted of fourteen cars: but at Wollaston, the fourteen forward cars were, after the head of the train was derailed, driven onward not only by their own momentum but also by the almost unchecked momentum of eight other cars behind them. The rear of the train did not leave the rails and was freely moving along them. By itself it must have weighed over 200 tons. The result was inevitable. Something had to yield; and the six forward cars were accordingly either thrown wholly to the one side or the other, or crushed between the two locomotives and the rear of the train. Two of them in fact were reduced into a mere mass of fragments. The disaster resulted in the death of 19 persons, while a much greater number were injured, more than 50 seriously. In this as in most other railroad disasters the surprising thing was that the list of casualties was not larger. Looking at the position of the two cars crushed into fragments it seemed almost impossible that any person in them could have escaped alive. Indeed that they did so was largely due to the fact that the season for car-warming had not yet arrived, while, in some way impossible to explain, all four of the men in charge of the locomotives, though flung violently through the air into the trees and ditch at the side of the road were neither stunned nor seriously injured. They were consequently able, as soon as they could gather themselves up, to take the measures necessary to extinguish the fires in their locomotives which otherwise would speedly have spread to the *débris* of the train. Had they not done so nothing could have saved the large number of passengers confined in the shattered cars.

CHAPTER IV.
ACCIDENTS AND CONSERVATISM

The four accidents which have been referred to, including that of April 17, 1836, upon the Manchester & Liverpool road, belong to one class. Though they covered a period of forty-two years they were all due to the same cause, the sudden derailment of a portion of the train, and its subsequent destruction because of the insufficient control of those in charge of it over its momentum. In the three earlier cases the appliances in use were much the same, for between 1836 and 1874 hardly any improvement as respects brakes had either forced its own way, or been forced by the government, into general acceptance in Great Britain. The Wollaston disaster, on the other hand, revealed a weak point in an improved appliance; the old danger seemed, indeed, to take a sort of pleasure in baffling human ingenuity. The Shipton accident, however, while one of the most fatal which ever occurred was also one of the most fruitful in results. This, and the accident of April 17, 1836, upon the Manchester & Liverpool road were almost precisely similar, though no less than thirty-eight years intervened between them. In the case of the first, however, no one was killed and consequently it was wholly barren of results; for experience has shown that to bring about any considerable reform, railroad disasters have, as it were, to be emphasized by loss of life. This, however, implies nothing more than the assertion that those responsible for the management of railroads do not differ from other men, – that they are apt, after some hair-breadth escape, to bless their fortunate stars for the present good rather than to take anxious heed for future dangers.

At the time the Shipton accident occurred the success of the modern train-brake, which places the speed of each of the component parts of the train under the direct and instantaneous control of him who is in charge of the locomotive, had for years been conceded even by the least progressive of American railroad managers. The want of such a brake and the absence of proper means of communication between the parts of the train had directly and obviously caused the murderous destructiveness of the accident. Yet in the investigation which ensued it appeared that the authorities of the Great Western Railway, being eminently "practical men," still entertained as respected the train-brake "very grave doubts of the wisdom of adopting [it] at all;" while at the same time, as respected a means of communication between the parts of the train, it appeared that the associated general managers of the leading railways "did not think that any [such] means of communication was at all required, or likely to be useful or successful."

Though quite incomprehensible, there is at the same time something superb in such an exhibition of stolid conservatism. It is British. It is, however, open to but one description of argument, the *ultima ratio* of railroad logic. So long as luck averted the loss of life in railroad disasters, no occasion would ever have been seen for disturbing time-honored precautions or antiquated appliances. While, how ever, a disaster like that of December 24, 1874, might not convince, it did compel: in spite of professed "grave doubts," incredulity and conservatism vanished, silenced, at least, in presence of so frightful a row of corpses as on that morning made ghastly the banks of the Cherwell. The general, though painfully slow and reluctant, introduction of train-brakes upon the railways of Great Britain may be said to have dated from that event.

In the matter of communication between those in the train and those in charge of it, the Shipton corpses chanced not to be witnesses to the precise point. Accordingly their evidence was, so to speak, ruled out of the case, and neither the utility nor the success of any appliance for this purpose was held to be yet proven. What further proof would be deemed conclusive did not appear, but the history of the discussion before and since is not without value. There is, indeed, something almost ludicrously characteristic in the manner with which those interested in the railway management of Great Britain strain at their gnats while they swallow their camels. They have grappled with the great question of

city travel with a superb financial and engineering sagacity, which has left all other communities hopelessly distanced; but, while carrying their passengers under and over the ebb and flow of the Thames and among the chimney pots of densest London to leave them on the very steps of the Royal Exchange, they have never been able to devise any satisfactory means for putting the traveller, in case of a disaster to the carriage in which he happens to be, in communication with the engine-driver of his train. An English substitute for the American bell-cord has for more than thirty years set the ingenuity of Great Britain at defiance.

As long ago as the year 1857, in consequence of two accidents to trains by fires, a circular on this subject was issued to the railway companies by the Board of Trade, in which it was stated that "from the beginning of the year 1854, down to the present time (December, 1857) there have been twenty-six cases in which either the accidents themselves or some of the ulterior consequences of the accidents would probably have been avoided had such a means of communication existed."[1] As none of these accidents had resulted in any considerable number of funerals the railway managers wholly failed to see the propriety of this circular, or the necessity of taking any steps in consequence of it. As, however, accidents from this cause were still reported, and with increasing frequency, the authorities in July, 1864, again bestirred themselves and issued another circular in which it was stated that "several instances have occurred of carriages having taken fire, or having been thrown off the rails, the passengers in which had no means of making their perilous situation known to the servants of the company in charge of the train. Recent occurrences also of a criminal nature in passenger railway trains have excited among the public a very general feeling of alarm." The last reference was more particularly to the memorable Briggs murder, which had taken place only a few days before on July 9th, and was then absorbing the public attention to the almost entire exclusion of everything else.

As no better illustration than this can be found of the extreme slowness with which the necessity for new railroad appliances is recognized in cases where profit is not involved, and of the value of wholesale slaughters, like those at Shipton and Angola, as a species of motive force in the direction of progress, a digression on the subject of English accidents due to the absence of bell-cords may be not without value. In the opinion of the railway managers the cases referred to by the Board of Trade officials failed to show the existence of any necessity for providing means of communication between portions of the train. A detailed statement of a few of the cases thus referred to will not only be found interesting in itself, but it will give some idea of the description of evidence which is considered insufficient. The circumstances of the Briggs murder, deeply interesting as they were, are too long for incidental statement; this, however, is not the case with some of the other occurrences. For instance, the Board of Trade circular was issued on July 30th; on July 7th, a year earlier, the following took place on the London & North Western road.

Two gentlemen took their seats at Liverpool in one of the compartments of the express train to London. In it they found already seated an elderly lady and a large, powerfully built man, apparently Irish, respectably dressed, but with a lowering, suspicious visage. Though one of the two gentlemen noticed this peculiarity as he entered the carriage, he gave no thought to it, but, going on with their conversation, he and his friend took their seats, and in a few moments the train started. Scarcely was it out of the station when the stranger changed his seat, placing himself on the other side of the carriage, close to the window, and at the same time, in a menacing way, incoherently muttering something to himself. The other passengers looked at him, but felt no particular alarm, and for a time

[1] The bell-cord in America, notwithstanding the theoretical objections which have been urged to its adoption in other countries, has proved such a simple and perfect protection against dangers from inability to communicate between portions of trains that accidents from this cause do not enter into the consideration of American railroad managers. Yet they do, now and again, occur. For instance, on February 28, 1874, a passenger coach in a west-bound accommodation train of the Great Western railroad of Canada took fire from the falling of a lamp in the closet at its forward end. The bell-cord was for some reason not connected with the locomotive, and the train ran two miles before it could be stopped. The coach in question was entirely destroyed and eight passengers were either burned or suffocated, while no less than thirteen others sustained injuries in jumping from the train.

he remained quietly in his seat. He then suddenly sprang up, and, with a large clasp-knife in his hand, rushed at one of the gentlemen, a Mr. Warland by name, and struck him on the forehead, the knife sliding along the bone and inflicting a frightful flesh wound. As he was in the act of repeating the blow, Warland's companion thrust him back upon the seat. This seemed to infuriate him, and starting to his feet he again tried to attack the wounded man. A frightful struggle ensued. It was a struggle for life, in a narrow compartment feebly lighted, for it was late at night, on a train running at full speed and with no stopping place for eighty miles. The passenger who had not been hurt clutched the maniac by the throat with one hand and grasped his knife with the other, but only to feel the blade drawn through his fingers, cutting them to the bone. The unfortunate elderly woman, the remaining occupant of the compartment, after screaming violently in her terror for a few moments, fainted away and fell upon the floor. The struggle nevertheless went on among the three men, until at last, though blinded with blood and weak from its loss, the wounded Mr. Warland got behind his assailant and threw him down, in which position the two succeeded in holding him, he striking and stabbing at both of them with his knife, shouting loudly all the time, and desperately endeavoring to rise and throw them off. They finally, however, got his knife away from him, and then kept him down until the train at last drew up at Camdentown station. When the ticket collector opened the compartment door at that place he found the four passengers on the floor, the woman senseless and two of the men holding the third, while the faces and clothing of all of them, together with seats, floor, windows and sides of the carriage were covered with blood or smeared with finger marks.

The assailant in this case, as it subsequently appeared upon his commitment for an assault, was a schoolmaster who had come over from Ireland to a competitive examination. He was insane, of course, but before the magistrate he made a statement which had in it something quite touching; he said that he saw the two gentlemen talking together, and, as he thought, making motions towards him; he believed them to be thieves who intended to rob him, and so he thought that he could not do better than defend himself, "if only for his dear little ones at home."

This took place before the Board of Trade circular was issued, but, as if to give emphasis to it, a few days only after its issue, in August, 1864, there was a not dissimilar occurrence in a third class carriage between London and Peterborough. The running distance was in this case eighty miles without a stop, and occupied generally an hour and fifty minutes, – the rate being forty-three miles an hour. In the compartment in question were five passengers, one of whom, a tall powerful fellow, was dressed like a sailor. The train was hardly out of London when this man, after searching his pockets for a moment, cried out that he had been robbed of his purse containing £17, and began violently to shout and gesticulate. He then tried to clamber through the window, getting his body and one leg out, and when his fellow passengers, catching hold of his other leg, succeeded in hauling him back, he turned savagely upon them and a desperate struggle ensued. At last he was gotten down by main force and bound to a seat. Meanwhile, notwithstanding the speed at which they were running, the noise of the struggle was heard in the adjoining compartments, and almost frantic efforts were made to stop the train. Word was passed from carriage to carriage for a short distance, but it proved impossible to communicate with the guard, or to do anything but thoroughly alarm the passengers. These merely knew that something was the matter, – what, they could only imagine, – and so the run to Peterborough was completed amid shouts of "stop the train," interspersed with frantic female shrieks. The man was suffering from *delirium tremens*.

About a year later, in December, 1865, a similar case occurred which, however, had in it strong elements of the ludicrous. A clergyman, laboring under great indignation and excitement, and without the slightest sense of the ridiculous, recounted his experience in a communication to the *Times*. He had found himself alone in a compartment of an express train in which were also a young lady and a man, both total strangers to him. Shortly after the train started the man began to give unmistakable indications of something wrong. He made no attempt at any violence on either of his fellow passengers, but he was noisy, and presently he proceeded to disrobe himself and otherwise to

indulge in antics which were even more indecent than they were extraordinary. The poor clergyman, – a respected incumbent of the established church returning to the bosom of his family, – was in a most distressing situation. At first he attempted remonstrance. This, however, proved worse than unavailing, and there was nothing for it but to have recourse to his umbrella, behind the sheltering cover of which he protected the modesty of the young lady, while over its edges he himself from time to time effected observations through an apparently interminable journey of forty and more miles.

These and numerous other cases of fires, murders, assaults and indecencies had occurred and filled the columns of the newspapers, without producing the slightest effect on the managers of the railway companies. No attention was paid by them to the Board of Trade circulars. At last Parliament took the matter up and in 1868 an act was passed, making compulsory some "efficient means of communication between the passenger and the servants of the company in charge" of railroad trains. Yet when six years later in 1874 the Shipton accident occurred, and was thought to be in some degree attributable to the absence of the very means of communication thus made compulsory, it appeared, as has been seen, that the associated general managers did not yet consider any such means of communication either required or likely to be useful.

Meanwhile, as if in ironical comment on such measured utterances, occurrences like the following, which took place as recently as the early part of 1878, from time to time still meet the eye in the columns of the English press: —

> "A burglar was being taken in a third-class carriage from London to Sheffield. When about twelve miles from Sheffield he asked that the windows might be opened. This was no sooner done than he took a dive out through the aperture. One of the warders succeeded in catching him by a foot, and for two miles he hung head downward suspended by one foot and making terrific struggles to free himself. In vain he wriggled, for although his captors were unable to catch the other foot, both held him as in a vise. But he wore spring-sided boots, and the one on which his fate seemingly depended came off. The burglar fell heavily on the foot-board of the carriage and rolled off on the railway. Three miles further on the train stopped, and the warders went back to the scene of the escape. Here they found him in the snow bleeding from a wound on the head. During the time he was struggling with the warders the warder who had one hand free and the passengers of the other compartments who were witnessing the scene from the windows of the train were indefatigable in their efforts to attract the attention of the guards by means of the communication cord, but with no result. For two miles the unfortunate man hung head downward, and for three miles further the train ran until it stopped at an ordinary resting place."

A single further example will more than sufficiently illustrate this instance of British railroad conservatism, and indicate the tremendous nature of the pressure which has been required to even partially force the American bell-cord into use in that country. One day, in the latter part of 1876, a Mr. A. J. Ellis of Liverpool had occasion to go to Chester. On his way there he had an experience with a lunatic, which he subsequently recounted before a magistrate as follows: —

> "On Friday last I took the 10.35 A.M., train from Lime Street in a third-class carriage, my destination being Chester. At Edge Hill Station the prisoner and another man, whom I afterward understood to be the prisoner's father, got into the same compartment, no one else being in the same compartment. The other person was much under the influence of drink when he entered, and was very noisy during the journey. The prisoner had the appearance of having been drinking, but was quiet. I sat with my back to the engine, on the getting-out side of the carriage; prisoner was sitting on the opposite side, with his right arm to the window, and the other person

was sitting on the same side as prisoner, about the middle of the seat. I was engaged reading, and did not exchange words with the prisoner.

"After we had passed over Runcorn bridge and through the station, I perceived the prisoner make a start, and looking toward him saw a white-hafted knife in his hand, about five inches long, with the blade open. He held it in his right hand in a menacing manner. Drawing his left hand along the edge of the blade, he said, "This will have to go into some – ." At that moment he looked at me across the carriage; he was on his feet in an instant, and looking across to me, he said, "You – , this will have to go into you," and made a bound toward me. The other jumped up and tried to prevent him. The prisoner threw him away; he made a plunge at my throat. I caught his wrist just as he advanced, and struggled with him, still holding fast to his wrist with both hands. We fell over and under one another two or three times, and eventually he overpowered me. I had fallen on my side on the seat, but still retained my hold upon his wrist. While lying in that position he held the knife down to within an inch of my throat. I called to the other man to hold the prisoner's hand back which contained the knife, and by that means he saved my life. I was growing powerless, and as the other man restrained the prisoner from using the knife, I jerked myself from his grasp, and knocked the knife out of the prisoner's hand with my left hand.

"The prisoner eluded the grip of his father, and falling on his knees began to seek for his knife. Failing to find the knife, he was instantly on his feet, and made a spring upon me. If I recollect aright, he threw his arms around my neck, and in this manner we struggled together up and down the carriage for some minutes, during which time he got my left thumb (with a glove on at the time) in his mouth, and bit it. Still retaining my thumb in his mouth, the other man struck him under the chin, when he released it, and fell on his knees seeking the knife, which he did not find. He was immediately on his feet, and again made a spring upon me. We had then a very long and desperate struggle, when he overpowered me and pinned me in a corner of the compartment. At last he got my right thumb into his mouth, holding my hand to steady it with both his hands while he bit it. With a great effort he then bit my thumb off, clean to the bone. I had no glove on that hand. I called to the other man to help me, but he seemed stupefied. He called two or three times to the prisoner, 'Leave the poor man alone. The poor man has done thee no harm.' Though sitting within nine inches of my knees he rendered me no help.

"When the prisoner bit my thumb off, he held it in his mouth; he pushed his head through the glass, spat the thumb into his hand and flung it out through the window. I then stood up and put my left hand in my pocket, took out my purse and cried out: 'If it is money you want take all I have.' He made a grab at the purse and flung it through the window, on the same side as the thumb was thrown out. From this act I inferred that I was struggling with a maniac. I retreated to the other end of the compartment, holding the other man between me and the prisoner, but he passed the other man by jumping over the seat and again got hold of me. Then he forced his head through the other window, breaking the glass, and, loosing me for a moment, with his fists smashed the remaining glass in the window. Addressing me he said: 'You – , you will have to go over;' at the same time he flung both his arms around my waist. I put my leg behind his and threw him on his back. I called upon the other man to help me and he did so.

"We held him down for some time, but he overpowered us and flung us back some distance. He then laid hold of my travelling rug and threw it through the window. Laying his hand on the bottom of the window he cried out, 'Here goes,'

> and made a leap through the window. I and the other man instantly laid hold of his legs as he was falling over. I got my four fingers into his right shoe, and, his father assisting me, we held him through the window, hanging head downward for about half a mile. I then fainted, and as I was losing my hold on his heels I have some faint recollection that the prisoner's father lost his hold at the same time, and I can't say what happened afterward. As I was coming to myself the train was stopping, and I heard the other man say, 'Oh, my son, my son.' When the train stopped I walked from the carriage to the station, and Dr. Robinson, who was sent for, came in about an hour and amputated my thumb further back."

While thus referring, however, to this instance of British railroad conservatism, which with a stolid indifference seems to ignore the teachings of every day life and to meet constantly recurring experience with a calm defiance, it will not do for the American railroad manager to pride himself too much on his own greater ingenuity and more amenable disposition. The Angola disaster has been referred to, as well as that at Shipton. If the absence of the bell-cord had indeed any part in the fatality of the latter, the presence in cars crowded with passengers of iron pots full of living fire lent horrors before almost unheard of to the former. The methods of accomplishing needed results which are usual to any people are never easily changed, whether in Europe or in America; but certainly the disasters which have first and last ensued from the failure to devise any safe means of heating passenger coaches in this country are out of all proportion to those which can be attributed in England to the absence of means of communication between the passengers on trains and those in charge of them. There is an American conservatism as well as an English; and when it comes to a question of running risks it would be strange indeed if the greater margin of security were found west of the Atlantic. The security afforded by the bell-cord assuredly has not as yet in this country off-set the danger incident to red-hot stoves.

CHAPTER V.
TELESCOPING AND THE MILLER PLATFORM

The period of exemption from wholesale railroad slaughters referred to in a previous chapter and which fortunately marked the early days of the system, seems to have lasted some eleven years. The record of great catastrophes opened on the Great Western railway of England, and it opened also, curiously enough, upon the 24th of December, a day which seems to have been peculiarly unfortunate in the annals of that corporation, seeing that it was likewise the date of the Shipton-on-Cherwell disaster. Upon that day, in 1841, a train, while moving through a thick fog at a high rate of speed, came suddenly in contact with a mass of earth that had slid down upon the track from the slope of the cutting. Instantly the whole rear of the train was piled up on the top of the first carriage, which happened to be crowded with passengers, eight of whom were killed on the spot while seventeen others were more or less injured. The coroner's jury returned a verdict of accidental death, and at the same time, as if to give the corporation a forcible hint to look closer to the condition of its roadway, a "deodand" of one hundred pounds was levied on the locomotive and tender. This practice, by the way, of levying a deodand in cases of railroad accidents resulting in loss of life, affords a curious illustration of how seldom those accidents must have occurred. The mere mention of it now as ever having existed sounds almost as strange and unreal as would an assertion that the corporations had in their earlier days been wont to settle their differences by wager of battle. Like the wager of battle, the deodand was a feature of the English common law derived from the feudal period. It was nothing more nor less than a species of fine, everything through the instrumentality of which accidental death occurred being forfeited to the crown; or, in lieu of the thing itself, its supposed money value as assessed by a coroner's jury.[2] Accordingly, down to somewhere about the year 1847, when the practice was finally abolished by act of Parliament, we find in all cases of English railroad accidents resulting in death, mention of the deodand assessed by coroner's juries on the locomotives. These appear to have been arbitrarily fixed, and graduated in amount as the circumstances of the particular accident seemed to excite in greater or less degree the sympathies or the indignation of the jury. In November, 1838, for instance, a locomotive exploded on the Manchester & Liverpool road, killing its engineer and fireman: and for this escapade a deodand of twenty pounds was assessed upon it by the coroner's jury; while upon another occasion, in 1839, where the locomotive struck and killed a man and horse at a street crossing, the deodand was fixed at no less a sum than fourteen hundred pounds, the full value of the engine. Yet in this last case there did not appear to be any circumstances rendering the corporation liable in civil damages. The deodand seems to have been looked upon as a species of rude penalty imposed on the use of dangerous appliances, – a sharp reminder to the corporations to look closely after their locomotives and employés. As, however, accidents increased in frequency it became painfully apparent that "crowner's 'quest law" was not in any appreciable degree better calculated to command the public respect in the days of Victoria than in those of Elizabeth, and the ancient usage was accordingly at last abolished. Certainly the position of railroad corporations would now be even more hazardous than it is, if, after every catastrophe resulting in death, the coroner's jury of the vicinage enjoyed the power of arbitrarily imposing on them such additional penalty not exceeding the value of a locomotive, in addition to all other liabilities, as might seem to it proper under the circumstances of the case.

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[2] "*Deodand.* By this is meant whatever personal chattel is the immediate occasion of the death of any reasonable creature: which is forfeited to the king, to be applied to pious uses, and distributed in alms by his high almoner; though formerly destined to a more superstitious purpose. * * * Wherever the thing is in motion, not only that part which immediately gives the wounds (as the wheel which runs over his body,) but all things which move with it and help to make the wound more dangerous, (as the cart and loading, which increase the pressure of the wheel) are forfeited." —*Blackstone, Book I, Chap. 8, XVI.*

Recurring, however, to the accident of December 24, 1861, the numerous casualties in that case were due to the crushing of the rolling stock which was not strong enough to resist the shock of the sudden stop. Under these circumstances the light, short English carriages rode over each other and were broken to pieces; under similar circumstances the longer and heavier cars then in use in America would have "telescoped;" that is, the platforms between the cars would have been broken off and the forward end of each car riding slightly up on its broken coupling would have shot in over the floor of the car before it, sweeping away the studding and other light wood-work and crushing stoves, seats and passengers into one inextricable mass, until, if the momentum was sufficiently great, the several vehicles in the train would be enclosed in each other somewhat like the slides of a partially shut telescope.

Crushing in other countries and telescoping in America were formerly the greatest, if not the worst, dangers to which travel by rail was liable. As respects crushing there is little to be said. It is a mere question of proportions, – resisting strength opposed to momentum. So long as trains go at great speed it is inevitable that they will occasionally be brought to a dead-stand by running upon unexpected obstacles. The simple wonder is that they do this so infrequently. When, however, now and again, they are thus brought to a dead-stand the safety of the passenger depends and can depend on nothing but the strength of the car in which he is sitting as measured by the force of the shock to which it is subjected. This matter has already been referred to in connection with the Shipton and Wollaston accidents,[3] the last of which was a significant reminder to all railroad managers that no matter how strongly or with how careful a regard to scientific principles cars may be constructed, just so long as they are made by human hands it is easy to load on weight sufficient, when combined with only a moderate momentum, to crush them into splinters.

Telescoping, however, was an incident of crushing, and a peculiarly American incident, which is not without a certain historical interest; for the particular feature in car construction which led directly to it and all its attendant train of grisly horrors furnishes a singular and instructive illustration of the gross violations of mechanical principles into which practical, as opposed to educated, mechanics are apt constantly to fall, – and in which, when once they have fallen, they steadily persist. The original idea of the railroad train was a succession of stage coaches chained together and hauled by a locomotive. The famous pioneer train of August 9, 1831, over the Mohawk Valley road was literally made up in this way, the bodies of stage coaches having been placed on trucks, which "were coupled together with chains or chain-links, leaving from two to three feet slack, and when the locomotive started it took up the slack by jerks, with sufficient force to jerk the passengers, who sat on seats across the tops of the coaches, out from under their hats, and in stopping they came together with such force as to send them flying from their seats." On this trip, it will be remembered, the train presently came to a stop, when the passengers upon it, with true American adaptability, set their wits at once to the work of devising some means of remedying the unpleasant jerks.[4] "A plan was soon hit upon and put in execution. The three links in the couplings of the cars were stretched to their utmost tension, a rail, from a fence in the neighborhood, was placed between each pair of cars and made fast by means of the packing yarn from the cylinders." Here was the incipient idea of couplers and buffers improvised by practical men, and for a third of a century it remained almost unimproved upon, except by the introduction of a spring upon which coupler and buffer played. The only other considerable change made in the earlier days of car construction was by no means an improvement, inasmuch as it introduced the new and wholly unnecessary danger of telescoping.

The original passenger cars, however frail and light they may have been, were at least, when shackled together in a train, continuous in their bearings on each other, – that is, their sills and floor timbers were all on a level and in line, so that, if the cars were suddenly pressed together, they met

[3] Ante pp. 18-19.

[4] Railroads: their Origin and Problems, p. 49.

in such a way as to resist the pressure to the extent of their resisting power, and the floor of one did not quietly slide under or over that of another. The bodies of these cars were about thirty-two inches from the rails. This was presently found to be too low. In raising the bodies of the cars, however, the mechanics of those days encountered a practical difficulty. The couplings of the cars built on the new model were higher than those of the old. They at once met, and, as they thought, no less ingeniously then successfully overcame this difficulty, by placing the couplings and draw-heads of their new cars below the line of the sills. This necessitated putting the platform which sustained the coupling also beneath the sills, and in doing that they disregarded, without the most remote consciousness of the fact, a fundamental law of mechanics. With a possible pressure, both sudden and heavy to be resisted, the line of resistance was no longer the line of greatest strength. During thirty years this stupid blunder remained uncorrected. It was as if the builders during that period had from force of habit insisted upon always using as supports pillars which were curved or bent instead of upright. At the close of those thirty years also the railroad mechanics had become so thoroughly educated into their false methods that it took yet other years and a series of frightful disasters, the significance of which they seemed utterly unable to take in, before they could be induced to abandon those methods.

The two great dangers of telescoping and oscillation were directly due to this system of car construction and of train coupling, – and telescoping and oscillation were probably the cause of one-half at least of the loss of life and the injuries to persons incident to the first thirty years of American railroad experience. The badly built and loosely connected coaches of every train going at any considerable rate of speed used then to swing and roll about and hammer against each other after a fashion which made the infrequent occurrence of serious disaster the only fair subject for surprise. In case of a sudden stoppage or partial derailment, the train stopped or went on, not as a whole, but as a succession of parts, while the low platforms and slack couplings fearfully increased the danger; – for, if the train held together, the cars in stopping were likely to break off the platforms, making of what remained of them a sort of inclined plane over which the car-bodies rode into each other at different levels; or, if the couplings, as was more probable, held and the train did not part, the swaying and swinging of the loosely connected cars was almost sure to throw them from the track and break them in pieces. The invention through which this difficulty was at last overcome, simple and obvious as it was, is fairly entitled, so far as America at least is concerned, to be classed among the four or five really noticeable advances which have of late years been made in railroad appliances. It contributed unmistakably and essentially to the safety of every traveller. Known as the Miller platform and buffer, from the name of the inventor, it was, like all good work of the sort, a simple and intelligent recurrence to correct mechanical principles. Miller went to work to construct cars in such a way as to cause them to come in contact with each other in the line of their greatest resisting power, while in coupling them together in trains he introduced both tension and compression; – that is he, in plain language, brought the ends of the heavy longitudinal floor timbers of the separate cars exactly on a line and directly bearing on each other, and then forced them against each other until the heavy spring buffers which played on those floor timbers were compressed, when the couplers sprung together and the train then stood practically one solid body from end to end. It could no more swing or crush than a single car could swing or crush. It then only remained to increase the weight and to perfect the construction of the vehicles to insure all the safety in this respect of which travel by rail admitted.

Simple as these improvements were, and apparently obvious as the mechanical principles on which they were based now seem, the opposition for years offered to them by practical master-mechanics and railroad men would have been ludicrous had it not been exasperating. There was hardly a railroad in the country whose officers did not insist that their method of construction was exceptional, it was true, but far better than Miller's. It was maintained that the slack couplings were necessary in order to enable the locomotives to start the trains, – that a train made up without the slack, on Miller's plan, could not be set in motion, and that if it was set in motion it must twist apart at every sharp curve etc. The ingenuity displayed in thus inventing theoretical objections to the appliance

far exceeded that required for inventing it, and indeed no one who has not had official experience of it can at all realize the objecting capacity of the typical practical mechanic whose conceit as a rule is measured by his ignorance, while his stupidity is unequalled save by his obstinacy. Even when Miller's invention for one reason or another was not adopted, the principles upon which that invention was founded, – the principles of tension, cohesion and direct resistance, – at last forced their way into general acceptance. The long-urged objection that the thing was practically impossible was slowly abandoned in face of the awkward but undeniable fact that it was done every day, and many times a day. Consequently, as the result of much patient arguing, duly emphasized by the regular recurrence of disaster, it is not too much to assert that for weight, resisting power, perfection of construction and equipment and the protection they afford to travellers, the standard American passenger coach is now far in advance of any other. As to comfort, convenience, taste in ornamentation, etc., these are so much matters of habit and education that it is unnecessary to discuss them. They do not affect the question of safety.

A very striking illustration of the vast increase of safety secured through this improved car construction was furnished in an accident, which happened in Massachusetts upon July 15, 1872. As an express train on the Boston & Providence road was that day running to Boston about noon and at a rate of speed of some forty miles an hour, it came in contact with a horse and wagon at a grade crossing in the town of Foxborough. The train was made up of thoroughly well-built cars, equipped with both the Miller platform and the Westinghouse train-brake. There was no time in which to check the speed, and it thus became a simple question of strength of construction, to be tested in an unavoidable collision. The engine struck the wagon, and instantly destroyed it. The horse had already cleared the rails when the wagon was struck, but, a portion of his harness getting caught on the locomotive, he was thrown down and dragged a short distance until his body came in contact with the platform of a station close to the spot of collision. The body was then forced under the cars, having been almost instantaneously rolled and pounded up into a hard, unyielding mass. The results which ensued were certainly very singular. Next to the locomotive was an ordinary baggage and mail car, and it was under this car, and between its forward and its hind truck, that the body of the horse was forced; coming then directly in contact with the truck of the rear wheels, it tore it from its fastenings and thus let the rear end of the car drop upon the track. In falling, this end snapped the coupling by its weight, and so disconnected the train, the locomotive going off towards Boston dragging this single car, with one end of it bumping along the track. Meanwhile the succeeding car of the train had swept over the body of the horse and the disconnected truck, which were thus brought in contact with its own wheels, which in their turn were also torn off; and so great was the momentum that in this way all of the four passenger cars which composed that part of the train were successively driven clean off their rolling gear, and not only did they then slide off the track, but they crossed a railroad siding which happened to be at that point, went down an embankment three or four feet in height, demolished a fence, passed into an adjoining field, and then at last, after glancing from the stump of a large oak-tree, they finally came to a stand-still some two hundred feet from the point at which they had left the track. There was not in this case even an approach to telescoping; on the contrary, each car rested perfectly firmly in its place as regarded all the others, not a person was injured, and when the wheel-less train at last became stationary the astonished passengers got up and hurried through the doors, the very glass in which as well as that in the windows was unbroken. Here was an indisputable victory of skill and science over accident, showing most vividly to what an infinitesimal extreme the dangers incident to telescoping may be reduced.

The vast progress in this direction made within twenty years can, however, best perhaps be illustrated by the results of two accidents almost precisely similar in character, which occurred, the one on the Great Western railroad of Canada, in October, 1854, the other on the Boston & Albany, in Massachusetts, in October, 1874. In the first case a regular train made up of a locomotive and seven cars, while approaching Detroit at a speed of some twenty miles an hour, ran into a gravel train

of fifteen cars which was backing towards it at a speed of some ten miles an hour. The locomotive of the passenger train was thrown completely off the track and down the embankment, dragging after it a baggage car. At the head of the passenger portion of the train were two second-class cars filled with emigrants; both of these were telescoped and demolished, and all their unfortunate occupants either killed or injured. The front of the succeeding first-class car was then crushed in, and a number of those in it were hurt. In all, no less than forty-seven persons lost their lives, while sixty others were maimed or severely bruised. So much for a collision in October, 1854. In October, 1874, on the Boston & Albany road, the regular New York express train, consisting of a locomotive and seven cars, while going during the night at a speed of forty miles an hour, was suddenly, near the Brimfield station, thrown by a misplaced switch into a siding upon which a number of platform freight cars were standing. The train was thoroughly equipped, having both Miller platform and Westinghouse brake. The six seconds which intervened, in the darkness, between notice of displacement and the collision did not enable the engineer to check perceptibly the speed of his train, and when the blow came it was a simple question of strength to resist. The shock must have been tremendous, for the locomotive and tender were flung off the track to the right and the baggage car to the left, the last being thrown across the interval between the siding and the main track and resting obliquely over the latter. The forward end of the first passenger coach was thrown beyond the baggage car up over the tender, and its rear end, as well as the forward end of the succeeding coach, was injured. As in the Foxborough case, several of the trucks were jerked out from under the cars to which they belonged, but not a person on the train was more than slightly bruised, the cars were not disconnected, nor was there even a suggestion of telescoping.

CHAPTER VI.
THE VERSAILLES ACCIDENT

Going back once more to the early days, a third of a century since, before yet the periodical recurrence of slaughter had caused either train-brake or Miller platform to be imagined as possibilities, before, indeed, there was yet any record of what we would now consider a regular railroad field-day, with its long train of accompanying horrors, including in the grisly array death by crushing, scalding, drowning, burning, and impalement, – going back to the year 1840, or thereabouts, we find that the railroad companies experienced a notable illustration of the truth of the ancient adage that it never rains but it pours; for it was then that the long immunity was rudely broken in upon. After that time disasters on the rail seemed to tread upon one another's heels in quick and frightful succession. Within a few months of the English catastrophe of December 24, 1841, there happened in France one of the most famous and most horrible railroad slaughters ever recorded. It took place on the 8th of May, 1842. It was the birthday of the king, Louis Philippe, and, in accordance with the usual practice, the occasion had been celebrated at Versailles by a great display of the fountains. At half past five o'clock these had stopped playing, and a general rush ensued for the trains then about to leave for Paris. That which went by the road along the left bank of the Seine was densely crowded, and so long that two locomotives were required to draw it. As it was moving at a high rate of speed between Bellevue and Meudon, the axle of the foremost of these two locomotives broke, letting the body of the engine drop to the ground. It instantly stopped, and the second locomotive was then driven by its impetus on top of the first, crushing its engineer and fireman, while the contents of both the fire-boxes were scattered over the roadway and among the *débris*. Three carriages crowded with passengers were then piled on top of this burning mass and there crushed together into each other. The doors of these carriages were locked, as was then and indeed is still the custom in Europe, and it so chanced that they had all been newly painted. They blazed up like pine kindlings. Some of the carriages were so shattered that a portion of those in them were enabled to extricate themselves, but the very much larger number were held fast; and of these such as were not so fortunate as to be crushed to death in the first shock perished hopelessly in the flames before the eyes of a throng of lookers-on impotent to aid. Fifty-two or fifty-three persons were supposed to have lost their lives in this disaster, and more than forty others were injured; the exact number of the killed, however, could never be ascertained, as the piling-up of the cars on top of the two locomotives had made of the destroyed portion of the train a veritable holocaust of the most hideous description. Not only did whole families perish together, – in one case no less than eleven members of the same family sharing a common fate, – but the remains of such as were destroyed could neither be identified nor separated. In one case a female foot was alone recognizable, while in others the bodies were calcined and and fused into an indistinguishable mass. The Academy of Sciences appointed a committee to inquire whether Admiral D'Urville, a distinguished French navigator, was among the victims. His body was thought to be found, but it was so terribly mutilated that it could be recognized only by a sculptor, who chanced some time before to have taken a phrenological cast of the skull. His wife and only son had perished with him.

It is not easy now to conceive the excitement and dismay which this catastrophe caused throughout France. The railroad was at once associated in the minds of an excitable people with novel forms of imminent death. France had at best been laggard enough in its adoption of the new invention, and now it seemed for a time as if the Versailles disaster was to operate as a barrier in the way of all further railroad development. Persons availed themselves of the steam roads already constructed as rarely as possible, and then in fear and trembling, while steps were taken to substitute horse for steam power on other roads then in process of construction.

The disaster was, indeed, one well calculated to make a deep impression on the popular mind, for it lacked almost no attribute of the dramatic and terrible. There were circumstances connected with it, too, which gave it a sort of moral significance, – contrasting so suddenly the joyous return from the country *fête* in the pleasant afternoon of May, with what De Quincey has called the vision of sudden death. It contained a whole homily on the familiar text. As respects the number of those killed and injured, also, the Versailles accident has not often been surpassed; perhaps never in France. In this country it was surpassed on one occasion, among others, under circumstances very similar to it. This was the accident at Camphill station, about twelve miles from Philadelphia, on July 17, 1856, which befell an excursion train carrying some eleven hundred children, who had gone out on a Sunday-school picnic in charge of their teachers and friends.

It was the usual story. The road had but a single track, and the train, both long and heavy, had been delayed and was running behind its schedule time. The conductor thought, however, that the next station could yet be reached in time to meet and there pass a regular train coming towards him. It may have been a miscalculation of seconds, it may have been a difference of watches, or perhaps the regular train was slightly before its time; but, however it happened, as the excursion train, while running at speed, was rounding a reverse curve, it came full upon the regular train, which had just left the station. In those days, as compared with the present, the cars were but egg-shells, and the shock was terrific. The locomotives struck each other, and, after rearing themselves up for an instant, it is said, like living animals, fell to the ground mere masses of rubbish. In any case the force of the shock was sufficient to hurl both engines from the track and lay them side by side at right angles to, and some distance from it. As only the excursion train happened to be running at speed, it alone had all the impetus necessary for telescoping; three of its cars accordingly closed in upon each other, and the children in them were crushed; as in the Versailles accident, two succeeding cars were driven upon this mass, and then fire was set to the whole from the ruins of the locomotives. It would be hard to imagine anything more thoroughly heart-rending, for the holocaust was of little children on a party of pleasure. Five cars in all were burned, and sixty-six persons perished; the injured numbered more than a hundred.[5]

Of this disaster nothing could be said either in excuse or in extenuation; it was not only one of the worst description, but it was one of that description the occurrence of which is most frequent. An excursion train, while running against time on a single-track road, came in collision with a regular train. The record is full of similar disasters, too numerous to admit of specific reference. Primarily of course, the conductors of the special trains are as a rule in fault in such cases. He certainly was at Camphill, and felt himself to be so, for the next day he committed suicide by swallowing arsenic. But in reality in these and in all similar cases, – both those which have happened and those hereafter surely destined to happen, – the full responsibility does not rest upon the unfortunate or careless subordinate; – nor should the weight of punishment be visited upon him. It belongs elsewhere. At this late day no board of directors, nor president, nor superintendent has any right to operate a single track road without the systematic use of the telegraph in connection with its train movements. That the telegraph can be used to block, as it is termed, double-track roads, by dividing them into sections upon no one

[5] A collision very similar to that at Camphill occurred upon the Erie railway at a point about 20 miles west of Port Jervis on the afternoon of July 15, 1864. The train in this case consisted of eighteen cars, in which were some 85 °Confederate soldiers on their way under guard to the prisoner's camp at Elmira. A coal train consisting of 50 loaded cars from the hanch took the main line at Lackawaxen. The telegraph operator there informed its conductor that the track was clear, and, while rounding a sharp reversed curve, the two trains came together, the one going at about twelve and the other at some twenty miles an hour. Some 60 of the soldiers, besides a number of train hands were killed on the spot, and 120 more were seriously injured, some of them fatally.This disaster occurred in the midst of some of the most important operations of the Rebellion and excited at the time hardly any notice. There was a suggestive military promptness in the subsequent proceedings. "T. J. Ridgeway, Esq., Associate Judge of Pike County, was soon on the spot, and, after consultation with Mr. Riddle [the superintendent of the Erie road] and the officer in command of the men, a jury was impanneled and an inquest held; after which a large trench was dug by the soldiers and the railway employés, 76 feet long, 8 feet wide and 6 feet deep, in which the bodies were at once interred in boxes, hastily constructed – one being allotted to four rebels, and one to each Union soldier." There were sixteen of the latter killed.

of which two trains can be running at the same time, is matter of long and daily experience. There is nothing new or experimental about it. It is a system which has been forced on the more crowded lines of the world as an alternative to perennial killings. That in the year 1879 excursion trains should rush along single-track roads and hurl themselves against regular trains, just as was done twenty-three years ago at Camphill, would be deemed incredible were not exactly similar accidents still from time to time reported. One occurred near St. Louis, for instance, on July 4, 1879. The simple fact is that to now operate single-track roads without the constant aid of the telegraph, as a means of blocking them for every irregular train, indicates a degree of wanton carelessness, or an excess of incompetence, for which adequate provision should be made in the criminal law. Nothing but this appeal to the whipping-post, as it were, seems to produce the needed mental activity; for it is difficult to realize the stupid conservatism of ordinary men when brought to the consideration of something to which they are not accustomed. On this very point of controlling the train movement of single-track roads by telegraph, for instance, within a very recent period the superintendent of a leading Massachusetts road gravely assured the railroad commissioners of that state, that he considered it a most dangerous reliance which had occasioned many disasters, and that he had no doubt it would be speedily abandoned as a practice in favor of the old time-table and running-rules system, from which no deviations would be allowed. This opinion was expressed, also, after the Revere disaster of 1871, it might have been supposed, had branded into the record of the state the impossibility of safely running any crowded railroad in a reliance upon the schedule.[6] Such men as this, however, are not accessible to argument or the teachings of experience, and the gentle stimulant of a criminal prosecution seems to be the only thing left.

[6] Chapter XIV, XVI.

CHAPTER VII.
TELEGRAPHIC COLLISIONS

And yet, even with the wires in active use, collisions will occasionally take place. They have sometimes, indeed, even been caused by the telegraph, so that railroad officials at two adjacent stations on the same road, having launched trains at each other beyond recall, have busied themselves while waiting for tidings of the inevitable collision in summoning medical assistance for those sure soon to be injured. In such cases, however, the mishap can almost invariably be traced to some defect in the system under which the telegraph is used; – such as a neglect to exact return messages to insure accuracy, or the delegating to inexperienced subordinates the work which can be properly performed only by a principal. This was singularly illustrated in a terrible collision which took place at Thorpe, between Norwich and Great Yarmouth, on the Great Eastern Railway in England, on the 10th of September, 1874. The line had in this place but a single track, and the mail train to Norwich, under the rule, had to wait at a station called Brundell until the arrival there of the evening express from Yarmouth, or until it received permission by the telegraph to proceed. On the evening of the disaster the express train was somewhat behind its time, and the inspector wrote a dispatch directing the mail to come forward without waiting for it. This dispatch he left in the telegraph office unsigned, while he went to attend to other matters. Just then the express train came along, and he at once allowed it to proceed. Hardly was it under way when the unsigned dispatch occurred to him, and the unfortunate man dashed to the telegraph office only to learn that the operator had forwarded it. Under the rules of the company no return message was required. A second dispatch was instantly sent to Brundell to stop the mail; the reply came back that the mail was gone. A collision was inevitable.

Конец ознакомительного фрагмента.