OF SOME RAILROAD ACCIDENTS.

II.

THE record of railroad horrors in the most aggravated form began at Versailles on the 8th of May, 1842; and doubtless it is destined to an indefinite continuance. Since then it has sometimes seemed as though locomotives had run mad or were indulging in a very carnival of disasters, so rapidly has one catastrophe trodden upon the heels of another. At least twice in England their frequent occurrence has occasioned so much public uneasiness as to lead to circulars addressed to the corporations, in one case by the Queen herself, and in the other by the government through the President of the Board of Trade. As a rule, these accidents were of a strikingly similar description, and a dry chronological enumeration of them would be neither profitable nor instructive. There are, however, those of them which are very memorable; some because of dramatic features in their occurrence, others because of the results which they produced in a permanently increased safety of travel. These are not without a lasting interest, although it is almost startling to see how soon and how completely they are forgotten. For instance, who now remembers even the name of the Abergele disaster? And yet it occurred but seven years since, and it would not be easy to conceive anything more striking and terribly dramatic than those incidents connected with it which caused all England for a space to think and speak of nothing else.

THE ABERGELE ACCIDENT.

The Irish mail is a famous train in England. Leaving London at shortly after seven A. M. it was timed in 1868 to make the distance to Chester, one hundred and sixty-six miles, in four hours and eighteen minutes; from Chester to Holyhead is eighty-five miles, for running which the space of one hundred and twenty-five minutes was allowed. Abergele is a point on the sea-coast in the north of Wales, nearly midway between these two places. On the 20th of August, 1868, the Irish mail left Chester as usual. It was made up of thirteen carriages in all, which were occupied, as the carriages of that train usually were, by a large number of persons whose names at least were widely known. Among these, on this particular occasion, were the Duchess of Abercorn, wife of the then Lord Lieutenant of Ireland, with five children. Under the running arrangements of the London & North-Western road a freight, or as it is there called a goods train, left Chester half an hour before the mail, and was placed upon the siding at Llanddulas, a station about a mile and a half beyond Abergele, to allow the mail to pass. From Abergele to Llanddulas the track ascended by a gradient of some sixty feet to the mile. On the day of the accident it chanced that certain wagons between the engine and the rear end of the goods train had to be taken out to be left at Llanddulas, and in doing this it became necessary to separate the train and to leave five or six of the last cars in it standing on the tracks of the main line, while those which were to be left were backed on to a siding. The employé whose duty it was to have done so neglected to set the brakes on the wagons thus left standing, and consequently when the engine and the rest of the train returned for them, the moment they were touched, and before a coupling could be effected, the jar set them in motion down the incline towards Abergele. They started so slowly that a brakeman of the train ran after them, fully expecting to catch and stop them, but as they went down the grade they soon outstripped him, and it became clear that there was nothing to check them until they should meet the Irish

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mail, then almost due. It also chanced that the cars thus loosened were oil cars.

The track of the North-Western road between Abergele and Llanddulas runs along the sides of the picturesque Welsh hills, which rise up to the south, while to the north there stretches out a wide expanse of sea. The mail train was skirting the hills and laboring up the grade at a speed of some thirty miles an hour, when its engineer suddenly perceived the loose wagons coming down upon it around the curve, and then but a few yards off. Seeing that they were oil cars he almost instinctively sprang from his locomotive, and was thrown down by the impetus and rolled to the side of the road-bed. Picking himself up, bruised but not seriously hurt, he saw that the collision had already taken place, that the tender had ridden directly over the engine, that the colliding cars were demolished, and that the foremost carriages of the train were already on fire. Running quickly to the rear of the train he succeeded in uncoupling six carriages and a van, which were drawn away from the rest before the flames extended to them by an engine which most fortunately was following the train. All the other carriages were utterly destroyed, and every person in them perished.

The Abergele was probably a solitary instance, in the record of railroad accidents, in which but a single survivor sustained any injury. There was no maiming. It was death or entire escape. The collision was not a particularly severe one, and the engineer of the mail train especially stated that at the moment it occurred the loose cars were still moving so slowly that he would not have sprung from his engine had he not seen that they were loaded with oil. The very instant the collision took place, however, the fluid seemed to ignite and to flash along the train like lightning, so that it was impossible to approach a carriage when once it caught fire. The fact was that the oil in vast quantities was spilled upon the track and ignited by the fire of the locomotive, and then the impetus of the mail train forced all of its leading carriages into the dense mass of smoke and flame. All those who were present concurred in positively stating that not a cry, nor a moan, nor a sound of any description was heard from the burning carriages, nor did any one in them apparently make an effort to escape.

The most graphic description of this extraordinary and terrible catastrophe was that given by the Marquis of Hamilton, the eldest son of the Duke of Abercorn, whose wife and family, fortunately for themselves, occupied one of those rear carriages which were unshackled and saved. In his account the Marquis of Hamilton said: "We were startled by a collision and a shock which, though not very severe, were sufficient to throw every one against his opposite neighbor. I immediately jumped out of the carriage, when a fearful sight met my view. Already the whole of the three passengers' carriages in front of ours, the vans, and the engine were enveloped in dense sheets of flame and smoke, rising fully twenty feet high, and spreading out in every direction. It was the work of an instant. No words can convey the instantaneous nature of the explosion and conflagration. I had actually got out almost before the shock of the collision was over, and this was the spectacle which already presented itself. Not a sound, not a scream, not a struggle to escape, not a movement of any sort was apparent in the doomed carriages. It was as though an electric flash had at once paralyzed and stricken every one of their occupants. So complete was the absence of any presence of living or struggling life in them that, as soon as the passengers from the other parts of the train were in some degree recovered from their first shock and consternation, it was imagined that the burning carriages were destitute of passengers; a hope soon changed into feelings of horror when their contents of charred and mutilated remains were discovered an hour afterward. From the extent, however, of the flames, the suddenness of the conflagration, and the absence of

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any power to extricate themselves, no human aid would have been of any assistance to the sufferers, who, in all probability, were instantaneously suffocated by the black and fetid smoke peculiar to paraffine, which rose in volumes around the spreading flames."

Though the collision took place before one o'clock, in spite of the efforts of a large gang of men who were kept throwing water on the tracks, the perfect sea of flame which covered the line for a distance of some forty or fifty yards could not be extinguished until nearly eight o'clock in the evening; for the petroleum had flowed down into the ballasting of the road, and the rails themselves were red-hot. It was therefore small occasion for surprise that when the fire was at last gotten under, the remains of those who lost their lives were in some cases wholly undistinguishable, and in others almost so. Among the thirty-three victims of the disaster the body of no single one retained any traces of individuality; the faces of all were wholly destroyed, and in no case were there found feet or legs or anything at all approaching to a perfect head. Ten corpses were finally identified as those of males, and thirteen as those of females, while the sex of ten others could not be determined. The body of one passenger, Lord Farnham, was identified by the crest on his watch; and, indeed, no better evidence of the wealth and social position of the victims of this accident could have been asked for than the collection of articles found on its site. It included diamonds of great size and singular brilliancy; rubies, opals, emeralds, gold tops of smelling-bottles, twenty-four watches, of which but two or three were not gold, chains, clasps of bags, and very many bundles of keys. Of these the diamonds alone had successfully resisted the intense heat of the flame; the settings were nearly all destroyed.

Of the causes of this accident little need or can be said. No human appliances, no more ingenious brakes or increased strength of construction, could have averted it or warded off its consequences once it was inevitable. It was occasioned primarily by two things, the most dangerous and the most difficult to reach of all the many sources of danger against which those managing railroads have unsleepingly to contend: a somewhat defective discipline, aggravated by a little not unnatural carelessness. The rule of the company was specific that all the wagons of every goods train should be out of the way and the track clear at least ten minutes before a passenger train was due; but in this case shunting was going actively on when the Irish mail was within a mile and a half. A careless brakeman then forgot for once that he was leaving his wagons standing close to the head of an incline; a blow in coupling, a little heavier perhaps than usual, sufficed to set them in motion; and they happened to be loaded with oil.

Behind all this, however, there was apparent a grave and radical defect in the construction of the road or the arrangement of its sidings, in that the station at Landdulas was placed upon an incline at all. As will hereafter be seen, this practice on the part of those laying out railroads has been the cause of frequent disaster, and must continue to be so as long as it exists. Every engineer knows perfectly well what the angle of equilibrium is, and to establish sidings or to habitually permit shunting where that angle is exceeded at the head of an incline is simply to insure soon or late a disaster.

THE NEW HAMBURG ACCIDENT.

A catastrophe strikingly similar to that at Abergele befell an express train on the Hudson River Railroad, upon the night of the 6th of February, 1871. The weather for a number of days preceding the accident had been unusually cold, and it is to the suffering of employés incident to exposure, and the consequent neglect of precautions on their part, that accidents are peculiarly due. On this night a freight train was going south, all those in charge of which were sheltering themselves during a

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steady run in the caboose car at its rear end. Suddenly, when near a bridge over Wappinger's Creek, not far from New Hamburg, they discovered that a car in the centre of the train was off the track. The train was finally stopped on the bridge, but in stopping it other cars were also derailed, and one of these, bearing on it two large oil tanks, finally rested obliquely across the bridge with one end projecting over the up track. Hardly had the disabled train been brought to a stand still, when, before signal lanterns could in the confusion incident to the disaster be sent out, the Pacific express from New York, which was a little behind its time, came rapidly along. As it approached the bridge, its engineer saw a red lantern swung, and instantly gave the signal to apply the brakes. It was too late to avoid the collision; but what ensued had in it, so far as the engineer was concerned, an element of the heroic, which his companion, the fireman of the engine, afterwards described on the witness stand with a directness and simplicity of language which exceeded all art. The engineer's name was Simmons, and he was familiarly known among his companions as "Doc." His fireman, Nicholas Tallon, also saw the red light swing on the bridge, and called out to him that the draw was open. In reply Simmons told him to spring the patent brake, which he did, and by this time they were alongside of the locomotive of the disabled train and running with a somewhat slackened speed. Tallon had now got out upon the step of the locomotive, preparatory to springing off, and turning asked his companion if he also proposed to do the same: "Doc looked around at me but made no reply, and then looked ahead again, watching his business; then I jumped and rolled down on the ice in the creek; the next I knew I heard the crash and saw the fire and smoke." The next seen of "Doc" Simmons, he was dragged up days afterwards from under his locomotive at the bottom of the river. But it was a good way to die. He went out of the world and of the sight of men with his hand on the lever, making no reply to the suggestion that he should leave his post, but "looking ahead and watching his business."

Dante himself could not have imagined a greater complication of horrors than then ensued: liquid fire and solid frost combined to make the work of destruction perfect. The shock of the collision broke in pieces the oil car, igniting its contents and flinging them about in every direction. In an instant bridge, river, locomotive, cars, and the glittering surface of the ice were wrapped in a sheet of flame; at the same time the strain proved too severe for the trestle-work, which gave way, precipitating the locomotive, tender, baggage cars, and one passenger car on to the ice, through which they instantly crushed and sank deep out of sight beneath the water. Of the remaining seven cars of the passenger train, two, besides several of the freight train, were destroyed by fire, and shortly, as the supports of the remaining portions of the bridge burned away, the superstructure fell on the half-submerged train and buried it from view.

Twenty-one persons lost their lives in this disaster, and a large number of others were injured; but the loss of life, it will be noticed, was only two thirds of that at Abergele. The New Hamburg catastrophe also differed from that at Abergele in that, under its particular circumstances, it was far more preventable, and, indeed, with the appliances since brought into use it would surely have been avoided. The modern train-brake had, however, not then been perfected, so that even the hundred rods at which the signal was seen did not afford a sufficient space in which to stop the train. Under any circumstances, however, it is difficult to see how it is possible to guard against contingencies like those at either Abergele or New Hamburg. At the time, as is usual in such cases, the public indignation expended itself in vague denunciation of the Hudson River Railroad Company, because the disaster happened to take place upon a bridge in which there was a draw to admit the passage of vessels. There seemed to be a vague but very general

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impression that draw-bridges were dangerous things, and, because other accidents due to different causes had happened upon them, that the occurrence of this accident, from whatever cause, was in itself sufficient evidence of gross carelessness. The fact was that not even the clumsy Connecticut rule, which compels the stopping of all trains before entering on any draw-bridge, would have sufficed to avert the New Hamburg disaster, for the river was then frozen and the draw was not in use, so that for the time being the bridge was an ordinary bridge; and not even in the frenzy of crude suggestions which invariably succeeds each new accident was any one ever found ignorant enough to suggest the stopping of all trains before entering upon every bridge, which, as railroads generally follow water-courses, would not infrequently necessitate an average of one stop to every thousand feet or so. Only incidentally did the bridge at New Hamburg have anything to do with the disaster there, the essence of which lay in the sudden derailment of an oil car in front of a passenger train running in the opposite direction and on the other track. Of course, if the derailment had occurred long enough before the passenger train came up to allow the proper signals to be given, and this precaution had been neglected, then the disaster would have been due, not to the original cause, but to the defective discipline of the employés. Such does not appear to have been the case at New Hamburg, nor was that disaster by any means the first due to derailment and the throwing of cars from one track in front of a train passing upon the other. Indeed, an accident hardly less destructive, arising from that very cause, had occurred only eight months previous in England, and resulted in eighteen deaths and more than fifty cases of injury.

THE CLAYBRIDGE LANE ACCIDENT.

A goods train made up of a locomotive and twenty-nine wagons was running at a speed of some twenty miles an hour on the Great Northern road, between Newark and Claypole, about one hundred miles from London, when the forward axle under one of the wagons broke. As a result of the derailment which ensued, the train became divided, and presently the disabled car was driven by the pressure behind it out of its course and over the interval, so that it finally rested partly across the other track. At just this moment an excursion train from London, made up of twenty-three carriages and containing some three hundred and forty passengers, came along at a speed of about thirty-five miles an hour. It was quite dark, and the engineer of the freight train in vain waved his arm as a signal of danger; one of the guards, also, showed a red light with his hand lantern, but his action either was not seen or was misunderstood, for, without any reduction of the speed being made, the engine of the excursion train plunged headlong into the disabled goods wagon. The collision was so violent as to turn the engine aside off the track and cause it to strike the stone pier of a bridge near by, by which it was flung completely around and then driven up the slope of the embankment, where it toppled over like a rearing horse and fell back into the roadway. The tender likewise was overturned, but not so the carriages; they rushed along holding to the track, and the side of each as it passed was ripped and torn by the projecting end of the freight car. Of the twenty-three carriages and vans in the train scarcely one escaped damage, while the more forward ones were in several cases lifted one on top of the other or forced partly up the embankment, whence they fell back again, crushing the passengers beneath them.

This accident occurred on the 21st of June, 1870; it was very thoroughly investigated by Captain Tyler on behalf of the Board of Trade, with the apparent conclusion that it was one which could hardly have been guarded against. The freight car whose broken axle occasioned the disaster did not belong to the Great Northern company, and the wheels of the train had been properly

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examined by viewing and tapping at the several stopping-places; the flaw which led to the fracture was, however, of such a nature that it could have been detected only by the removal of the wheel. It did not appear that the employés of the company had been guilty of any negligence; but it was difficult to avoid the conclusion that the accident was due to one of those defects to which the results of even the most perfect human workmanship must ever remain liable, and this had revealed itself under exactly those conditions which must involve the most disastrous consequences.

The English accident did, however, establish one thing, if nothing else; it showed the immeasurable superiority of the system of investigation pursued in the case of railroad accidents in England over that pursued in this country. There a trained expert after the occurrence of each disaster visits the spot and sifts the affair to the very bottom, locating responsibility and pointing out distinctly the measures necessary to guard against its repetition. Here the case goes to a coroner's jury, whose findings as a rule admirably sustain the ancient reputation of that august tribunal. It is absolutely sad to follow the course of these investigations, they are conducted with such an entire disregard of method and lead to such inadequate conclusions. Indeed, how could it be otherwise? The same man never investigates two accidents, and for the one investigation he does make he is competent only in his own esteem.

Take the New Hamburg accident as an example. Rarely has any catastrophe merited a more careful investigation, and few indeed have ever called forth more ill-considered criticism or crude suggestions. Almost nothing of interest respecting it was elicited at the inquest, and now no reliable criticism can be ventured upon it. The question of responsibility in that case, and of prevention thereafter, involved careful inquiry into at least four subjects: First, the ownership and condition of the freight car the fractured axle of which occasioned the disaster, together with the precautions taken by the company, usually and in this particular case, to test the wheels of freight cars moving over its road, especially during times of severe cold. Second, the conduct of those in charge of the freight train immediately preceding and at the time of the accident; was the fracture of the axle at once noticed and were measures taken to stop the train, or was the derailment aggravated into the form it finally took by neglect? Third, was there any neglect in signaling the accident on the part of those in charge of the disabled train, and how much time elapsed between the accident and the collision? Fourth, what, if any, improved appliances would have enabled those in charge of either train to have averted the accident, and what, if any, defects either in the rules or the equipment in use were revealed?

No satisfactory conclusion can now be arrived at upon any of these points, though the probabilities are that with the appliances since introduced the train might have been stopped in time. In this case, as in that at Claybridge, the coroner's jury returned a verdict exonerating every one concerned from responsibility, and very possibly they were justified in so doing; though it is extremely questionable whether Captain Tyler would have arrived at a similar conclusion. There is a strong probability that the investigation went off, so to speak, on a wholly false issue, — turned on the draw-bridge frenzy instead of upon the question of care. So far as the verdict declared that the disaster was due to a collision between a passenger train and a derailed oil car, and not to the existence of a draw in the bridge on which it happened to occur, it was, indeed, entitled to respect, and yet it was on this very point that it excited the most criticism. Loud commendation was heard through the press of the Connecticut law, which had been in force in that State for twenty years, and, indeed, still is in force there, under which all trains are compelled to come to a full stop before entering on any bridge which has a draw in it, — a law which may best be described as a useless nui-

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sance. Yet the grand jury of the Court of Oyer and Terminer of New York city even went so far as to recommend, in a report made by it on the 23d of February, 1871, — sixteen days after the accident, — the passage by the legislature then in session at Albany of a similar legal absurdity. Fortunately better counsels prevailed, and as the public recovered its equilibrium the matter was allowed to drop.

The Connecticut law in question, however, originated in an accident which at the time had startled and shocked the community as much even as that at Versailles before or at Abergele has since done. It occurred on the New York & New Haven road at Norwalk, on the 6th of May, 1853.

THE NORWALK ACCIDENT.

The railroad at Norwalk crosses a small inlet of Long Island Sound by means of a draw-bridge, which is approached from the direction of New York around a sharp curve. A ball at the mast-head was in 1853 the signal that the draw was open and the bridge closed to the passage of trains. The express passenger train for Boston, consisting of a locomotive and two baggage and five passenger cars, containing about one hundred and fifty persons, left New York as usual at eight o'clock that morning. The locomotive was not in charge of its usual engineer, but of a substitute named Tucker, a man who some seven years before had been injured in a previous collision on the same road, for which he did not appear to have been in any way responsible; but who had then given up his position and gone to California, whence he had recently returned and was now again an applicant for an engineer's situation. This was his third trip over the road, as substitute. In approaching the bridge at Norwalk he apparently wholly neglected to look for the draw signal. He was running his train at about the usual rate of speed, and first became aware that the draw was open when within four hundred feet of it and after it had become wholly impossible to stop the train in time. He immediately whistled for brakes and reversed his engine, and then, without setting the brakes on his tender, both he and the fireman sprang off and escaped with trifling injuries. The train at this time did not appear to be moving at a speed of over fifteen miles an hour. The draw was sixty feet in width; the water in the then state of the tide was about twelve feet deep, and the same distance below the level of the bridge. Although the speed of the train had been materially reduced, yet when it came to the opening it was still moving with sufficient impetus to send its locomotive clean across the sixty-foot interval and to cause it to strike the opposite abutment about eight feet below the track; it then fell heavily to the bottom. The tender lodged on top of it, bottom up and resting against the pier, while on top of this again was the first baggage car. The second baggage car, which contained also a compartment for smokers, followed, but in falling was canted over to the north side of the draw in such a way as not to be wholly submerged, so that most of those in it were saved. The first passenger car plunged into the opening next; its forward end crushed in, as it fell against the baggage car in front of it, while its rear end dropped into the deep water below; and on top of it came the second passenger car, burying the passengers in the first beneath the *débris*, and partially submerging itself. The succeeding or third passenger car, instead of following the others, broke in two in the middle, the forward part hanging down over the edge of the draw, while the rear of it rested on the track and stayed the course of the remainder of the train. Including those in the smoking compartment more than a hundred persons were plunged into the channel, of whom forty-six lost their lives, while some thirty others were more or less severely injured. The killed were mainly among the passengers in the first car; for in falling the roof of the second car was split open, and it finally rested in such a position that, as no succeeding car came on top of it, many of those in it were enabled to extricate themselves; indeed, more than one of

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the passengers in falling were absolutely thrown through the aperture in the roof, and, without any volition on their part, were saved with unmoistened garments.

This terrible disaster was due, not alone to the carelessness of an engineer, but to the use of a crude and inadequate system of signals. It so happened, however, that the legislature of the State was unfortunately in session at the time, and consequently the public panic and indignation took shape in a law compelling every train on a Connecticut railroad to come to a dead stand-still before entering upon any bridge in which there was a draw. This law is still in force, and from time to time, as after the New Hamburg catastrophe, an unreasoning clamor is raised for its enactment in other States. In point of fact it imposes a most absurd, unnecessary, and annoying delay on traveling, and rests upon the Connecticut statute book a curious illustration of what usually happens when legislators undertake to incorporate running railroad regulations into the statutes-at-large. There is probably no source of danger to which travel by rail is subject which admits of such certain and infallible signaling as draws in bridges. The idea of stopping before approaching them is entitled to about the same respect as would be a proposal to recur to pioneer locomotives before all night trains.

ACCIDENTS AT DRAW-BRIDGES.

The machinery by which draws must be worked can be automatically connected with signals of almost any description at any desired distance. By one method in use a careless engineer is suddenly aroused to a proper performance of his duties and a consciousness of impending danger by the disappearance of the smoke-stack of his locomotive; by yet others his passing a given point in defiance of signals sends him crashing through a gate and causes the sounding of an alarm sufficient to arouse all but the dead. Either of these methods secures a much greater degree of safety than a mere stopping of trains, which in more than one instance has proved a wholly insufficient protection.

This was curiously illustrated in the case of an accident which occurred upon the Boston & Maine Railroad on the morning of the 21st of November, 1862, when the early local passenger train was run into the open draw of the bridge almost at the entrance to the Boston station. It so happened that the train had stopped at the Charlestown station just before going on to the bridge, and at the time the accident occurred was moving at a speed scarcely faster than a man could walk; and yet the locomotive was entirely submerged, as the water at that point is deep, and the only thing which probably saved the train was that the draw was so narrow and the cars were so long that the foremost one lodged across the opening, and its forward end only was beneath the water. At the rate at which the train was moving, the resistance thus offered was sufficient to stop it, though, even as it was, no less than six persons lost their lives and a much larger number were more or less injured. Here all the precautions imposed by the Connecticut law were taken, and served only to reveal the weak point in it. The accident was due to the neglect of the corporation in not having the draw and its system of signals interlocked in such a way that the movement of the one should automatically cause a corresponding movement of the other; and this neglect in high quarters made it possible for a careless employé to open the draw on a particularly dark and foggy morning, while he forgot at the same time to shift his signals. A statute provision making compulsory the interlocking of all draws in railroad bridges with a proper and infallible system of signals might, therefore, have claims on the consideration of an intelligent legislature; not so an enactment which compels the stopping of trains at points where danger is small, and makes no provision as respects other points where it is great.

And yet bridge accidents always have been and will probably always remain among the worst to which travel by rail

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is exposed. It would be impossible for corporations to take too great precautions against them, and that the precautions taken are very great is conclusively shown by the fact that with thousands of bridges many times each day subjected to the strain of the passage at speed of heavy trains, so very few disasters occur. Nevertheless there are many precautions which, in the face of terrible experience, corporations do not and will not take. For instance, every railroad bridge, not only throughout its length but throughout its approaches, should have its track protected against possible derailment. It is the exception and not the rule, however, that this is done. Long immunity from disaster breeds a species of recklessness even in the most cautious, and yet the single mishap in a thousand must surely fall to the lot of some one. Many years ago the terrible results which must soon or late be expected, wherever the consequences of a derailment on the approaches to a bridge are not surely guarded against, were illustrated by a disaster on the Great Western Railroad of Canada which combined many of the worst horrors of both the Norwalk and the New Hamburg tragedies; more recently the almost forgotten lesson was enforced again on the Vermont & Massachusetts road, upon the bridge over the Miller River, at Athol. The accident last referred to occurred on the 16th of June, 1870, but, though forcible enough as a reminder, it was tame indeed in comparison with the Des Jardines Canal disaster, which is still remembered though it happened as long ago as the 17th of March, 1857.

THE DES JARDINES CANAL ACCIDENT.

The Great Western Railroad of Canada crossed the canal by a bridge at an elevation of about sixty feet. At the time of the accident there were some eighteen feet of water in the canal, though, as is usual in Canada at that season, it was covered by ice some two feet in thickness. On the afternoon of the 17th of March, as the local accommodation train from Hamilton was nearing the bridge, its locomotive, though it was then moving at a very slow rate of speed, was in some way thrown from the track and on to the timbers of the bridge. These it cut through, and then, falling heavily on the string-pieces, it parted them and instantly pitched headlong on to the frozen surface of the canal below, dragging after it the tender, baggage car, and two passenger cars, which composed the whole train. There was nothing whatever to break the fall of sixty feet; and even then two feet of ice only intervened between the ruins of the train and the bottom of the canal eighteen feet below. Two feet of solid ice will afford no contemptible resistance to a falling body; the locomotive and tender crushed heavily through it and instantly sank out of sight. In falling the baggage car struck a corner of the tender and was thus thrown some ten yards to one side, and was followed by the first passenger car, which, turning a somersault as it went down, fell on its roof and was crushed to fragments, but only partially broke through the ice. Upon which the next car fell endwise, and rested in that position. That every human being in the first car was either crushed or drowned seems most natural; the only cause for astonishment is found in the fact that any one should have survived such a catastrophe, — a tumble of sixty feet on ice as solid as a rock! Yet of four persons in the baggage car three went down with it, and not one of them was more than slightly injured. The engineer and fireman, and the occupants of the second passenger car, were less fortunate. The former were found crushed under the locomotive in the bottom of the canal; while of the latter ten were killed, and not one escaped severe injury. Very rarely indeed in the history of railroad accidents have so large a portion of those on the train lost their lives as in this case, for out of ninety persons sixty perished, and in the number was included every woman and child among the passengers, with a single exception.

There were two circumstances about this disaster worthy of especial notice. In the first place, as well as can now be

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ascertained, in the absence of any trustworthy record of an investigation into causes, the accident was easily preventable, though by means of appliances which even yet have never been brought into general use. It appears to have been immediately caused by the derailment of a locomotive, however occasioned, just as it was entering on a swing draw-bridge. Thrown from the tracks, there was nothing in the flooring to prevent the derailed locomotive from deflecting from its course until it toppled over the ends of the ties, nor were the ties and the flooring apparently sufficiently strong to sustain it even while it held to its course. Under such circumstances the derailment of a locomotive upon any bridge can mean only destruction; it meant it then, it means it now; and yet our country is to-day full of bridges constructed in an exactly similar way. A very simple and inexpensive appliance would make accidents from this cause, if not impossible, at least highly improbable. It is only necessary to make the ties and flooring of all bridges between the tracks and for three feet on either side of them sufficiently strong to sustain the whole weight of a train off the track and in motion, while a third rail, or strong truss of wood, securely fastened, should be laid down midway between the rails throughout the entire length of the bridge and its approaches. With this arrangement, as the flanges of the wheels are on the inside, it must follow that in case of derailment and a divergence to one side or the other of the bridge, the inner side of the flange will come against the central rail or truss just so soon as the divergence amounts to half the space between the rails, which in the ordinary gauge is two feet and ten inches. The wheels must then glide along this guard, holding the train from any further divergence from its course, until it can be checked. Meanwhile, as the ties and flooring extend for the space of three feet outside of the track, a sufficient support is furnished by them for the other wheels. A legislative enactment compelling the construction of all bridges in this way, coupled with additional provisions for the interlocking of draws with their signals in the cases of bridges across navigable waters, would be open to the objection that laws against dangers of accident by rail have almost invariably proved ineffective when they were not absurd, but in itself, if enforced, it might not improbably render disasters like those at Norwalk and Des Jardines terrors of the past. The New Hamburg accident depended on other conditions.

There was, also, one rather noteworthy feature in the Des Jardines accident. The question as to what is the best method of coupling together the several individual vehicles which make up every railroad train has always been much discussed among railroad mechanics. The decided weight of opinion has been in favor of the strongest and closest couplings, so that under no circumstances should the train separate into parts. Taking all forms of railroad accident together, this conclusion is probably sound. It is, however, at best only a balancing of disadvantages, a mere question as to which practice involves the least amount of danger. Yet a very terrible demonstration that there are two sides to this as to most other questions was furnished at Des Jardines. It was the custom on the Great Western road not only to couple the cars together in the usual method then in use, but also, as is often done now, to connect them by heavy chains on each side of the bumpers. Accordingly when the locomotive broke through the Des Jardines bridge, it dragged the rest of the train hopelessly after it. This certainly would not have happened had the modern self-coupler been in use, and probably would not have happened had the cars been connected only by the ordinary link and pins; for the train was going very slowly and the signal for brakes was given in ample time to apply them vigorously before the last cars came to the opening, into which they were finally dragged by the dead weight before them and not hurried by their own impetus.

On the other hand, we have not far to go in search of scarcely less fatal disasters illustrating with equal force the

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other side of the proposition, in the terrible consequences which have ensued from the separation of cars in cases of derailment. Take the memorable accident of the 17th of June, 1858, near Port Jervis, on the Erie Railway, for instance.

THE PORT JERVIS ACCIDENT.

As the express train from New York was running at a speed of about thirty miles an hour over a perfectly straight piece of track between Otisville and Port Jervis, shortly after dark on the evening of that day, it encountered a broken rail. The train was made up of a locomotive, two baggage cars, and five passenger cars, all of which except the last passed safely over the fractured rail. The last car was apparently derailed by this, and drew the car before it off the track. These two cars were then dragged along, swaying fearfully from side to side, for a distance of some four hundred feet, when the couplings at last snapped and they went over the embankment, which was there some thirty feet in height. As they rushed down the slope, the last car turned fairly over, resting finally on its roof, while one of its heavy iron trucks broke through and fell upon the passengers beneath, killing and maiming them. The other car, more fortunate, rested at last upon its side on a pile of stones at the foot of the embankment. Six persons were killed and fifty severely injured; all of the former in the last car.

In this case, had the couplings held, the derailed cars would not have gone over the embankment and but slight injuries would have been sustained. Modern improvements have, however, created safeguards sufficient to prevent the recurrence of other accidents under the some conditions as that at Port Jervis. The difficulty lay in the inability to stop a train, though moving at only moderate speed, within a reasonable time. The wretched inefficiency of the old hand-brake in a sudden emergency received one more illustration. The train seems to have run nearly half a mile, after the accident took place, before it could be stopped, although the engineer had instant notice of it and reversed his locomotive. The couplings did not snap until a distance had been traversed in which the modern train-brake would have reduced the speed to a point at which they would have been subjected to no dangerous strain.

THE CAR'S ROCK ACCIDENT.

The accident ten years later at Car's Rock, on the same road, sixteen miles west of Port Jervis, was again very similar to the one just described; and yet in this case the parting of the couplings alone prevented the rear of the train from dragging its head to destruction. Both disasters were occasioned by broken rails; but, while the first occurred on a tangent, the last was on a curve at a point where the road, skirting along the hills, had on one side of it a bold elevation and on the other a steep declivity of some eighty feet, jagged with rock and bowlders. The train was a long one, consisting of the locomotive, three baggage and express, and seven passenger cars, and it encountered the broken rail while rounding the curve at a high rate of speed. Again all the train passed over the fracture in safety, except the last car, which was snapped, as it were, off the track and over the embankment. At first it was dragged along, but only for a short distance; the intense strain then broke the coupling between the four rear cars and the head of the train, and the last of the four being already over the precipice the others almost instantly toppled over after it and plunged and rolled down the ravine. A passenger on this portion of the train, who went with it, described the car he was in "as going over and over, until the outer roof was torn off, the sides fell out, and the inner roof was crushed in." Twenty-four persons were killed and eighty injured; but in this instance, as in that at Des Jardines, the only subject for surprise was that there were any survivors.

Accidents arising from the parting of defective couplings have of course not been uncommon, and they constitute

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one of the greatest dangers incident to heavy gradients; in surmounting inclines freight trains will, it is found, break in two, and their hinder parts come thundering down the grade, as was seen at Abergele. The American passenger trains, in which each car is provided with brakes, are much less liable than the English, the speed of which is regulated by brake vans, to accidents of this description. Indeed, it may be questioned whether in America any serious disaster has occurred from the fact that a portion of a passenger train on a road operated by steam got beyond control in descending an incline. There have been, however, terrible catastrophes from this cause in England, and that on the Lancashire & Yorkshire road near Helmshere, a station some fourteen miles north of Manchester, deserves a prominent place in the record of railroad accidents.

THE HELMSHERE ACCIDENT.

It occurred in the early hours of the morning of the 4th of September, 1860. There had been a great *fête* at the Bellevue Gardens in Manchester on the 3d, upon the conclusion of which some twenty-five hundred persons crowded at once upon the return trains. Of these there were, on the Lancashire & Yorkshire road, three; the first consisting of fourteen, the second of thirty-one, and the last of twenty-four carriages; and they were started, with intervals of ten minutes between them, at about eleven o'clock at night. The first train finished its journey in safety. Not so the second and the third. The Helmshere station is at the top of a steep incline. This the second train, drawn by two locomotives, surmounted, and then stopped for the delivery of passengers. While these were leaving the carriages, a snap as of fractured iron was heard, and the guards, looking back, saw the whole rear portion of the train, consisting of seventeen carriages and a brake-van, detached from the rest of it and quietly slipping down the incline. The detached portion was moving so slowly that one of the guards succeeded in catching the van and applying the brakes; it was, however, already too late. The velocity was greater than the brake-power could overcome, and the seventeen carriages kept descending more and more rapidly. Meanwhile the third train had reached the foot of the incline and begun to ascend it, when its engineer, on rounding a curve, caught sight of the descending carriages. He immediately reversed his engine, but before he could bring his train to a stand they were upon him. Fortunately the van-brakes of the detached carriages, though insufficient to stop them, yet did reduce their speed; the collision nevertheless was terrific. The force of the blow, so far as the advancing train was concerned, expended itself on the locomotive, which was demolished, while the passengers escaped with a fright. Not so those in the descending carriages. With them there was nothing to break the blow, and the two foremost of them were crushed to fragments and their passengers scattered over the line. It was shortly after midnight, and the excursionists clambered out of the trains and rushed frantically about, impeding every effort to clear away the débris and rescue the injured, whose shrieks and cries were incessant. The bodies of ten persons, one of whom had died of suffocation, were ultimately extricated from the ruins, and twenty-two others sustained fractures of limbs.

At Des Jardines the couplings were too strong; at Port Jervis and at Helmshere they were not strong enough; at Car's Rock they gave way not a moment too soon. "There are objections to a plenum and there are objections to a vacuum," as Dr. Johnson remarked, "but a plenum or a vacuum it must be;" but there are no arguments in favor of railroad stations or sidings upon an inclined plane. Abergele was one illustration of what soon or late must result from them, and Helmshere was another. In railroad mechanics there are after all some points susceptible of demonstration. That they should still be ignored is hardly less singular than it is surprising.

Charles Francis Adams, Jr.

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RECENT LITERATURE

THE ballad of The Witch's Daughter, which, with some change and very advantageous enlargement, is now published under a new title, Mabel Martin,[1] is one of Mr. Whittier's most tender and searching stories in verse. The conception of a pure and tender-hearted girl, bereft of her mother by the religious madness of the Salem witch-slayers, living haunted by the memory of that dreadful and bewildering loss and by the taunts of her neighbors, is in itself singularly pathetic; but the situation is treated with that honest sympathy tempered by a wise reticence which gives to some of Mr. Whittier's poems a fresh, firm grain, and a delicate and primitive perfume, like that of the pine. The poet has prefixed a short introduction, in the same measure with the original ballad, which sketches the scene of the legend. The description of this valley, that

> "Holds to the sun, the sheltering hills
> And glimmering water-line between,
> Broad fields of corn and meadows green,"

is a substantial gain to the poem. Several new stanzas, also, have been inserted at different points, with the delicate touch of a hand that has lost none of its cunning and can greatly enrich its former work by a few masterly strokes. The lines which show us Mabel shrinking homeward in the dark, from the husking-party at Esek Harden's, are very lovely; as also these, on her reaching her empty home: —

> "And, like a gaunt and spectral hand,
> The tremulous shadow of a birch
> Reached out and touched the door's low porch,
> As if to lift its latch." . . .

Miss Hallock's illustration of this passage is a charming triumph of sympathetic skill. The young girl stands at the door, with one hand lifted toward the latch-string, leaning her head against the wood in an attitude of weary sadness, with which is blended a weird and touching suggestion of her listening for some ghostly sound from within, from the deserted hearthstone where her murdered mother had in life been wont to await her, perhaps. The dead birch-bough, silvered by moonlight, stretches across, and just behind it the fine tracery of its tangled shadow clings to the door. For technical merit and exquisite feeling, this drawing should, we think, be set highest among Miss Hallock's contributions to the book. The same division (Part V.) of the ballad contains drawings by Miss Hallock only; and each one is rich in sentiment, while several have great beauty of execution. The river-view, "She saw the rippled waters shine," is a soft vista of thoroughly poetic landscape. It is noticeable, we think, however, that the artist is not so successful in scenes including several figures as in those devoted to one or two. There is a certain inadequacy rather than absence of characterization in the two husking-scenes, and though this is improved in the representation of Goody Martin ascending the scaffold, we find in the latter case a want of depth in the artist's imagining, which fails to grasp the horror and dread of the occasion. This superior success with the single figures is owing, perhaps, to the concentration of interest upon Esek and Mabel, in the poem itself; the graceful groups in The Hanging of the Crane amply prove Miss Hallock's ability in arrangement. On the whole, she has here presented us with a beautiful series of drawings; and Mr. Moran's introductory and accompanying landscapes lend to the human story a deep undertone of sylvan emotion. Mr. Waud comes somewhat in the rear with his half-titles; though that which ushers in Part II. is apt and clever. All the decorative appointments of the volume are graceful, and we must especially praise the simple cover, with its loose stalks of golden wheat and its band of black wheat-ears above and below. For the excellent taste which prevails, as well as for the cutting of the blocks, we in common with other readers owe Mr. A. V. S. Anthony many thanks.

— Baron Davillier's book on Spain,[2] so pleasantly written, so abundantly and brilliantly illustrated, and so magnificently published, will not be surpassed, we fancy, by any other holiday book of its sort; it

[1] *Mabel Martin.* By JOHN GREENLEAF WHITTIER. With Illustrations. Boston: James R. Osgood & Co. 1875.

[2] *Spain.* By the BARON CH. DAVILLIER. Illustrated by Gustave Doré. Translated by J. THOMPSON, F. R. G. S. New York: Scribner, Welford, and Armstrong. 1876.

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