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Helen C. Knight**

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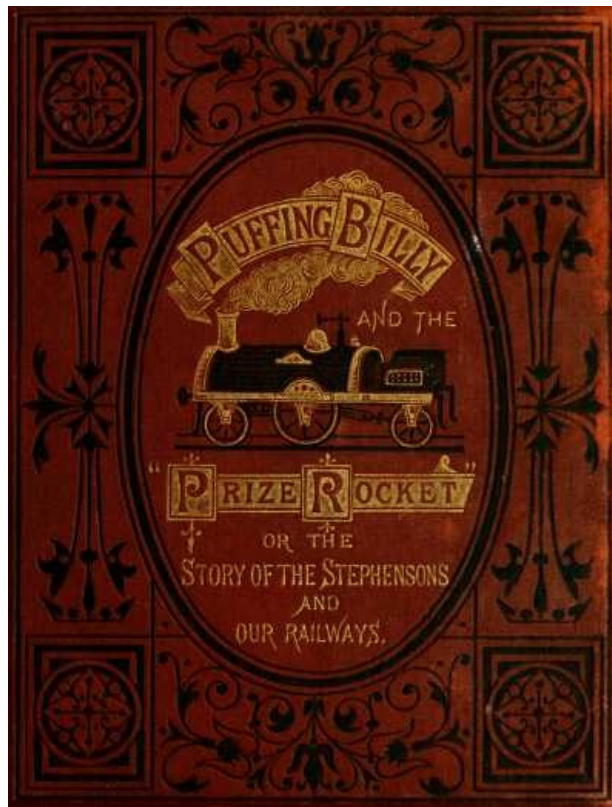
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**Puffing Billy and the Prize Rocket,  
Or the Story of the Stephenson's and our Railways.**

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**George Stephenson**

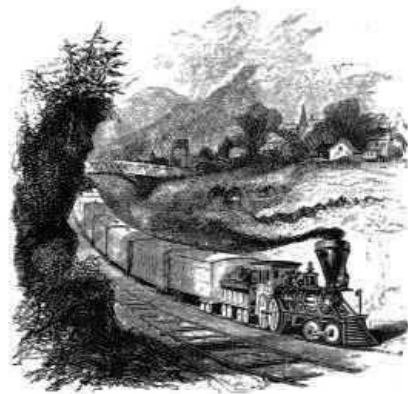
**"PUFFING BILLY"**

AND

**THE PRIZE "ROCKET;"**

OR,

THE STORY OF THE STEPHENSONS AND OUR RAILWAYS.



BY MRS. H. C. KNIGHT.

LONDON:

S. W. PARTRIDGE & CO., 9, PATERNOSTER ROW.

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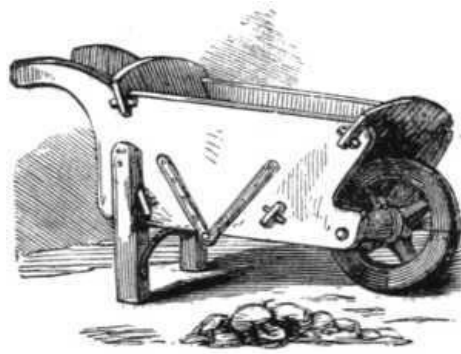
## PREFACE.

A brief book for the boys. God gives you work to do in the world. He gives you honourable work. There is much done that is mean and dishonourable. Depend upon it, *that* is not His. In the beginning of your work, character grows *out* of it; as you go on, your character goes *into* it. Therefore the Bible declares that "God, without respect of persons, judgeth according to every man's work." We judge in the same way. This little book will show you how much the practice of the virtues—the humbler virtues—has to do with making good work. A superior article cannot be produced without them.

But keep ever in mind that these virtues, however useful and important for your work in this world, have no *saving* power in them; they form no plea for the favour of God; the key which unlocks the door of heaven is not found among them. Like the young man in the Gospel, you may have the loveliness of every natural virtue, and yet be lost.

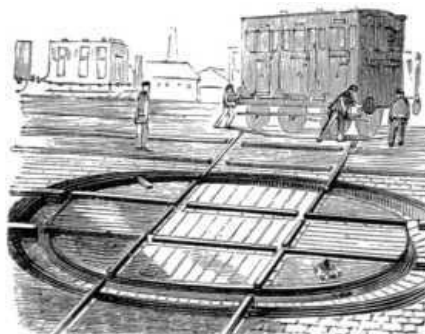
As sinners in the sight of God, you need the atoning blood of the Redeemer; you need repentance and faith in that blood. Make Jesus Christ, therefore, the cornerstone of your character; on *that foundation build* your character. Cultivate the graces of the Gospel. Baptize the virtues with your Saviour's love. A noble Christian manhood can only be attained by the steady endeavours of a heart fixed on God, and a hand diligent, and delighting in the work He has given it to do.

H. C. K.



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## CHAPTER I.

### LIFE AMONG THE COAL-PITS.

What useful little fellow is this, carrying his father's dinner to him at the coal-pit? He takes care, also, of his little brothers and sisters, keeping them clear of the coal-waggons, which run to and fro before the cottage door. Then he is seen tending a neighbour's cows. Now he is moulding mud engines, sticking in hemlock sticks for blowpipes; besides cutting many a good caper, and uttering all sorts of drolleries for the benefit of other little boys, who, like himself, swarm round, too poor to go to school, if school there were—but schools there were none.

The boys call him "Geordie Steve."

A lad is wanted to shut the coal-yard gates after work is over. Geordie offers his services and gets the post, earning by it twopence a day. A neighbour hires him to hoe turnips at fourpence. He is thankful to earn a bit, for his parents are poor, and every little helps. He sees work ahead, however, more to his taste. What? He longs to be big enough to go and work at the coal-pits with his father. For the home of this little fellow, as you already perceive, is in a coal region. It is in the coal district of Newcastle, in the north-eastern part of England. You had better find it on the map.



I suppose you never visited a colliery. Coal is found in beds and veins underground. Deep holes are made, down which the miners go and dig it out; it is hoisted out by means of steam-engines. These holes are called shafts. The pitmen have two enemies to encounter down in the coal-pits—water, and a kind of gas which explodes on touching the flame of a candle. The water has to be pumped out; and miners are now provided with a lamp, called a safety-lamp, which is covered with a fine wire gauze to keep the gas away from the flame.

The coal is brought up from the pit in baskets, loaded on waggons, running then on tramroads, and sent to the sheds. Tramroads were a sort of wooden railway. A colliery is a busy and odd-looking spot.

Geordie's family lived in one room—father, mother, four boys, and two girls—curious quarters, one would think; but working men at that time had smaller wages and poorer homes than now, for Geordie was born in 1781, in the little village of Wylam, seven miles from Newcastle, and his full name is George Stephenson.

James, an older brother, is "picker;" and by-and-by George is old enough to be picker too, going with his father and brother to their daily tasks like a man. To clear the coal of stones and dross is their business. There are a number of pits around, and each one has a name, "Dolly pit," "Water-run pit," and so on.

I do not know how long George was picker, but we next find him driving a gin-horse at a pit two miles off, across the fields. Away he goes in the early morning, gladdened all along by many bird songs. George and the birds are fast friends. He knows where their nests are in the hedgerows, but he never robs them, and watches over them with fatherly affection. At home he has tame birds, whose pretty, knowing ways are the wonder of the neighbourhood. For many years a tame blackbird was as much one of the family as George himself, coming and going at pleasure, and roosting at night over his head. Sometimes it spent the summer in the woods, but was sure to come back with cold weather to share his care and crumbs through the winter.

George, too, had a famous breed of rabbits; and as for his dog, it was one of the most accomplished and faithful creatures in the district. In fact, the boy had an insight into animal nature, as we shall find he had into other things, that gave him power over it—a power which he never abused.

George next arose to be assistant fireman with his father, at a shilling a day. He was fourteen, and so small of his age that he used to hide when the inspector came round, lest he should be thought too small for his wages. If small in body, he was large in heart, intent in all things to *do his best*. And this made his work so well done that it could not escape the notice of his employers. When he went to the office on the Saturday night to receive his wages, double pay was given him, twelve instead of six shillings. George could scarcely believe in his good luck. When he found it was really no mistake, he took the money and rushed out of the office, exclaiming, "I am now a made man for life!"

George rapidly shot ahead of his father, a kind old man who always stayed as fireman, while his boy climbed one round after another up the ladder of promotion. At seventeen we find him plugman. What is that? A plugman has charge of a pumping-engine, and when the water in the pit is below the suction holes he goes down the shaft and plugs the tube, in order to make the pump more easily draw. The post required more skill and knowledge of machinery than any he had filled before, and George proved himself equal to it.

Indeed he loves his engine as he loves his birds. It is quite a pet with him. He keeps it in prime order. He takes it to pieces and cleans it and studies it; pries into the why and wherefore, and is never satisfied until he understands every spring and cog of the machinery, and gets the mastery of it. You never find him idling away his time. In leisure moments he is at his old study, moulding clay engines, and putting new thoughts into them.

He wished he knew the history of engines, and how they were thought out at first. Somebody told him about Watt, the father of steam-power, and that there were books which would satisfy his curiosity. Books! What good would books do poor George? He cannot read. Not read? No. He is eighteen, and hardly knows his letters. Few of the colliers could. They were at that time a rough and generally ignorant set of men, whose pay-day was a holiday, when their hard-won earnings were squandered at cock-fights and ale-houses.

If one was found who *did* read, what a centre of light was he! At night the men and boys gathered around him, when by the light of his engine-fire he would give them the news from an old newspaper, or a scrap of knowledge from some stray magazine, or a wild story from an odd volume; and on these occasions no one listened with more profound attention than George.

Oh, it was so wonderful to read, he thought! It was to open the gates into great fields of knowledge. Read he must. The desire grew upon him stronger and stronger. In the neighbouring hamlet of Welbottle old Robin Cowens taught an evening school.

"I'll go," cried George.

"And I too," echoed Tommy Musgrove, a fellow-workman, quite carried away by George's enthusiasm.

Now they went to Robin's school three evenings a week. I do not know how it was with Tommy, but old Robin never had a better scholar than George; indeed, he soon out-learned his master. His schooling cost him threepence a week, and, poor as it was, put into his hand the two keys of knowledge, *READING* and *WRITING*.

These mastered, he longs to use them. Andrew Robertson opens an evening school nearer than Welbottle, and Andrew proposes to teach arithmetic, a branch George is anxious to grapple with next. "And he took to figurin' wonderful," said Master Andrew, speaking of his new scholar, who soon left his class-mates far behind. And no wonder. Every spare moment to George was more precious than gold-dust, and was used accordingly. When not on duty he sits by his engine and works out his sums. No beer-shop enticed him to its cups. No cock-fight tempted him to be its spectator. He hates everything low and vulgar.



Andrew was proud of his pupil, and when George removed to another pit the old schoolmaster shifted his quarters and followed him. His books did not damage his interest in business. Was the plugman going to stay plugman? No. Bill Coe, a friend of his, advanced to a brakeman, offered to show George all about the machinery. The other workmen objected. One man stopped the working of the engine when George took hold of it, "for," he cried angrily, "Stephenson *can't* brake, and is too clumsy ever to learn."

A brakeman has charge of an engine for raising coal from a pit. The speed of the ascending coal, brought up in large hazel-wood baskets, was regulated by a powerful wooden brake, acting on the rim of the fly-wheel, which must be stopped just when the baskets reach the settle-board where they are to be emptied. Brakemen were generally chosen from experienced engine-men of steady habits; and in spite of the grumbling of older colliers, envious perhaps of his rise, it was not long before George learned, and was appointed brakeman at the "Dolly pit." This was in 1801.







**STEPHENSON'S COTTAGE.**

## **CHAPTER II.**

### **MENDING AND MAKING—LITTLE BOB.**

George was now twenty; sober, faithful, and expert. Finding a little spare time on his hands, he took to cobbling to increase his gains, and from this source contrived to save his first guinea. To this greater diligence he was urged by his love for Fanny Henderson, a fine, sweet-tempered girl, whom he shortly married, and went to housekeeping in the upper room of a small cottage in Willington, six miles from Newcastle. Happy were they in each other, and in their simple, industrious, and frugal habits; and when a little son was born to them, George, who loved birds, rabbits, and dogs so well, welcomed with all the tenderness of a father's heart the little Bobby.

Robert he was named, after his grandfather.

Accidents, they say, will happen in the best regulated families. Fanny's family was not an exception. One day the cottage chimney got on fire, and the neighbours, with friendly zeal, not only poured water enough down the chimney to put out a much bigger and more alarming fire, but enough to deluge the poor little home of the brakeman with soot and water, making a pitiful sight to the young husband when he reached it. His eight-day clock, the choicest bit of furniture the young couple had, was completely smothered by ashes. What was to be done? Sending it to a clock-maker for repairs was quite out of the question—it would cost too much.

"I'll try my own hand at it," said George. After righting everything else he attacked the clock, took it to pieces, carefully cleaned it, put it together, set it, and it *ticked*, ticking on as faithfully as ever. The astonished neighbours now sent him their clocks, and George became one of the most famous clock doctors in the district!

The young man's reputation for business soon won him a situation in Killingworth, the best and largest colliery in the region. But his brightened worldly prospects were soon clouded by a dark sorrow—the death of his young wife, after three happy years of married life. Poor George felt it deeply, which was perhaps one reason for accepting a situation in Scotland, hoping in a change of scene to divert the mournful current of his thoughts.

Leaving his little boy in kind hands, he set off to the north with his pack on his back, a-foot and alone, for Montrose, a long journey in those days. Good wages he received, and good friends he no doubt made, for everybody loved his honest and generous character; yet by the end of the year he yearned to get back to the friends and scenes of his early days. It was not home in Scotland, for it is only home where the heart is. With his savings in his pocket—twenty-eight pounds—back he trudged to Killingworth; and not before his friendly presence was greatly needed to comfort his aged parents, plunged in debt and affliction. By a terrible accident his father had lost his eyesight. No longer able to work, and receiving little or no help from his other children, who were barely able to maintain themselves, the old couple had a hard battle with life. But George is back again; all is now righted. He paid off their debts, and moved them to comfortable lodgings beside his own. He has father, mother, and Bobby to look after, and is thankful and happy in doing it.

Those were dark days, however, for the working-men of England. War was draining the country of men and money. Taxes were high, wages low, bread scarce, and able-bodied men were liable at any time to be impressed for the army or naval service. George himself was drawn, and go he must, or find a substitute; he found one, but it cost all he had to hire him.

Poor George was in straits. His spirits were much damped by the prospect of things around and before him. All business was in a discouraging condition. Some of his friends were about emigrating to America, and he at one time nearly concluded to join them. It was a sore trial to the young man. He loved his English home; and bitter tears did he in secret shed as he visited old haunts, the fields and lanes and scenes of his boyhood, feeling and fearing that all too soon the wide Atlantic might roll between him and them. But the necessary funds for such an enterprise were not forthcoming. George gave it up, therefore, and went to work for what wages the times would allow. Better times would come.



The thing nearest his heart was affording his little son an education. Keenly alive to his own early deficiencies and disadvantages, he determined to make them up in Robert. Every spare moment was of twofold value to him; and all the work he could pick up he cheerfully did. Besides tinkering old clocks and cobbling old shoes he took to cutting out the pitmen's clothes. Never was there such a fit; for George acted fully up to the principle that everything which was worth doing was worth doing well.

Busy as were his hands, his mind was no less busy, catching up and using every scrap of knowledge which came in his way. And it was a perpetual surprise to his fellow-workmen to see what a knack he had at bettering things. Everything improved in his hands. There was always progress on his track.

A new pit was opened at one of the collieries. Streams of water rushed in, which the most vigorous strokes of the pump could not lower. On the engine went, pumping, pumping, pumping for a year, and the water continued to flow in, until they nearly concluded to give up the pit as a failure. George's curiosity and interest were much excited, and always, on seeing the men, he asked how matters were coming on.

"Drowned out, drowned out," was the one and the same answer.

Over he went to the poor pit as often as he could to see for himself, and over he turned in his mind again and again the whys and wherefores of the failure.

"Weel, George," said his friend Kit one day, "what do you mak' o' her? Do you think you could doctor her?"

"Man," answered George, "in a week's time I could send you to the bottom."

The regular engineers were in high dudgeon with the forth-putting brakeman. What right had *he* to know how to cure an evil that had baffled them? His words, however, were reported at headquarters, and the contractor was not long hastening over to see if he could make his words good.

"Well, George," he said, "they tell me you think you can put that engine to rights."

"Yes, sir," replied the young man modestly, "I think I can."

As matters could be no worse, Mr. Dodds was ready to let him try. And George agreed, on condition that he should choose his own men to help him. The old hands were highly indignant, but there was no help for it. So they were ordered off, and George with his gang went on.

The engine was taken to pieces, examined, righted, and put together again. It was set to work. Did it go? Many a looker-on shook his head doubtfully, and prophesied in his inmost heart, "*No go.*" It pumped and pumped. The obstinate water found it had an antagonist that could master it. In less than two days it disappeared from the pit, and workmen were sent to the bottom. Who could gainsay George's skill?

Mr. Dodds, of course, was delighted. Over and above his wages he put a ten-pound note into the young man's hand, and engaged him to superintend his works for the future.

A profitable job was this.

The fame of this engineering exploit spread far and wide. As an engine doctor he took the lead, and many a weezy old thing was brought to him to cure. Envious engineers tried to put him down. But real merit cannot be put down. It is stern stuff.

George's cottage showed the bent of his tastes. It was like an old curiosity shop; full of models of engines, complete or in parts, hanging and standing round; for busy as he had need to be eking out his means by engineering clocks and coats, the construction and improvement of machinery for the collieries was his hobby.



Likeness of tastes drew a young farmer often to the cottage, John Wigham, who spent most of his evenings in George's society. John had a smattering of chemistry and philosophy, and a superior knowledge of mathematics, which made him a desirable companion. George put himself under his

tuition, and again took to "figuring;" tasks set him in the evening were worked out among the rough toils of the day. And so much honest purpose did not fail to secure progress. Drawing was another new line of effort. Sheets of plans and sections gave his rude desk the air of mindwork somewhere. Thus their winter evenings passed away.

Bobby was growing up in a little thought-world by himself; for he could not fail to be interested in all that interested his father, that father always making his son the companion of his studies, and early introducing him into the curious and cunning power of machinery.

Ah, that was a proud day when little Bob was old enough, and knew enough, to be sent to the academy at Newcastle. He was thirteen. His father's means had happily been increased. The old engine-wright of the colliery having died, George Stephenson was promoted to the post, on the salary of over a hundred pounds a year. This was in 1812.

The new office relieving him from incessant hard work, and the necessity of earning a shilling by extra labours, he had more time for study, and for verifying his plans of practical improvement; and the consequence was very considerable improvement in the machinery of the colliery to which he was attached.

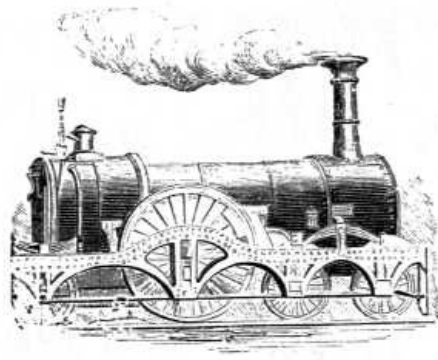
Meanwhile Robert's education went on apace. The boy was hungry for knowledge, not only for himself, but to satisfy the voracious appetite of his father, and the no less keen one of John Wigham.

Robert joined a literary and philosophical society at Newcastle, whose fine library opened a rich storehouse of material. Here the boy spent most of his time out of school, storing his mind with principles, facts, and illustrations, to carry home on Saturday afternoon. Books also. The Edinburgh Encyclopædia was at his command. A volume of that at the cottage unfolded a world of wonders. But the library had some books too choice to be trusted away. How was Robert to get the gist of these home? His father had often said that a "good drawing and a well-executed plan would always explain itself," and many a time he had placed a rough sketch of machinery before his son and told him to describe it. Robert, therefore, when he could do no better, put his drilling to test, and copied diagrams and drew pictures, thus taking many an important and perhaps rare specimen of machinery and science to Killingworth, for his father's benefit.

We can well imagine Saturday afternoon was as much a holiday to father as to son. Robert's coming was hailed with delight. John did not lag far behind. Some of the neighbours dropped in to listen to discussions which made the little room a spot of lively interest and earnest toil. Wide-awake mind allows nothing stagnant around it.

Among the borrowed books of the day was Ferguson's "Astronomy," which put father and son to calculating and constructing a sun-dial for the latitude of Killingworth. It was wrought in stone, and fixed on the cottage door; and there it stands still, with its date, August 11, 1816—a year or two before Robert left school—a fair specimen of the drift of his boyish tastes.





## CHAPTER III.

### WHO BEGAN RAILROADS—"PUFFING BILLY."

Familiar as it has become to us, who does not stop to look with interest at the puffing, snorting, screaming steam-horse? And who does not rejoice in the iron-rail, which binds together with its slender threads the north and the south, and makes neighbours of the east and the west?

"Who *began* railroads?" ask the boys again and again.

The first idea of the modern railroad had its birth at a colliery nearly two hundred years ago. In order to lighten the labour of the horses the colliers let straight pieces of wood into the road leading from the pit to the river where the coal was discharged; and the waggons were found to run so much easier, that one horse could draw four or five chaldrons. As wood quickly wore out, and moreover was liable to rot, the next step was nailing plates of iron on the wooden rail, which gave them for a time the name of "plateway" roads. A Mr. Outram making still farther improvements, they were called Outram roads, or, for shortness' sake, "tram-roads"; and tramroads came into general use at the English collieries.

"There's mischief in those tramroads," said a large canal owner, foreseeing they would one day push canal stock quite out of the market.

Improvements thus far had centred on the roads. To convey heavy loads easier and faster was the point aimed at. Nobody had yet thought of self-going teams. Watt, the father of steam-engines, said steam-carriages might be built. He, however, never tried one; but rather left the idea to sprout in the brain of an old pupil of his, William Murdock, who did construct a very small one, running on thin wheels, and heated by a lamp. It was a curious success in its way, and set other minds thinking.

One of these was a tin-miner of Cornwall, Captain Trevethick, a friend of Murdock, who joined a cousin of his in getting a patent for building a steam-carriage. It was built, and an odd piece of machinery it was. It ran on four wheels over a common road, looked like a stage-coach, and delighted both the inventor and his friends. They determined to exhibit it at London. While on its journey, driving it one day at the top of its speed, they saw a toll-gate in the distance; not being able to check it in time, bump it went against the gate, which flew open in a trice, leaving the affrighted tollman, in answer to their inquiries, "How much to pay?" only able to gasp out, "No—noth-ing to pay—drive off as fast as you can! nothing to pay!"

It reached London in safety, and was some time on exhibition. Multitudes flocked to see it, and some called it a "fiery dragon."

"Ah," said Sir Humphrey Davy, very much interested in the invention, "I hope to see the captain's 'dragons' on all the roads of England yet."

But the captain exhibited it only as a curiosity, the unevenness of the roads rendering it for all practical purposes a failure; and the captain had neither pluck nor genius enough to lay or clear a track for it himself. This was in 1803.

The idea, however, was in England, lodging itself here and there in busy brains; until at last a colliery owner in Newcastle, seeing the great advantage of having a locomotive on his tram-roads, determined to try what *he* could do. Accordingly he had one built after the Cornish captain's model. It burst up at starting. Noways baffled, he tried again. The engine proved a clumsy affair, moved at a snail's pace, often got off the rails, and at length, voted by the workmen a "perfect plague," it was taken off. The unsuccessful inventor was called a fool by his neighbours, and his efforts an apt illustration that "a fool and his money are soon parted." In spite of failure, Mr. Blckett had faith that the thing *could* be done. He built a third, and ran it on the tramroad that passed by old Bob Stephenson's cottage door. And George at his colliery, seven miles off, as you may suppose, listened to every account of it with profound interest. Over he went, as often as he could, to see "Black Billy," a rough specimen of machinery at best, doing very little service beyond what a good horse could do.

George carried "Black Billy" back in his mind to Killingworth, studying its defects and laying

plans to improve it. I do not know how long he was coming to it, but he at length gave it as his opinion that he could make a better "travelling engine" than that.

Tidings came to Killingworth about this time that the trial of a new engine was to take place on a certain day at Leeds, and George did not lose the chance of being present. Though the engine moved no faster than three miles an hour, its constructor counted it a success. It proved, however, unsteady and unreliable, and at last blew up, which was the end of it.

What did George think then? He more than ever wanted to try *his* hand at the business. Lord Ravensworth, knowing enough of Stephenson to have faith in him, hearing of this, advanced means for the enterprise. Good tools and good workmen were alike wanting; but after much labour, alteration, and anxiety, in ten months' time the engine was completed and put on the railway, July 25, 1814.

Although the best yet made, it was awkward and slow. It carried eight loaded waggons of thirty tons' weight at a speed not above four miles an hour. The want of springs occasioned a vast deal of jolting, which damaged the machinery, and at the close of a year's trial it was found about as costly as horse-power.

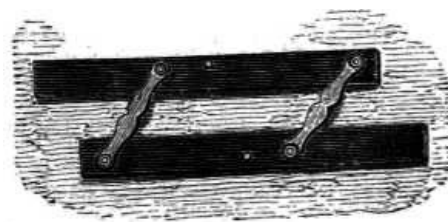
How to increase the power of his engine—that was the puzzling question which George studied to answer. He wrestled with it day and night, and at length determined to try again. In due time another was built, "Puffing Billy," which most persons looked upon as a marvel, but, shaking their heads, prophesied it would make a terrible blow-up some day. "Puffing Billy," however, went to work, and worked steadily on, a vast advance on all preceding attempts. It attracted little or no attention outside the narrow circle of the collieries. The great men of England did not know that in a far-off nook of the realm there was slowly generating a power, under the persistent thought of a humble working-man, which, before many years, would revolutionize the trade of the kingdom and create a new source of wealth.

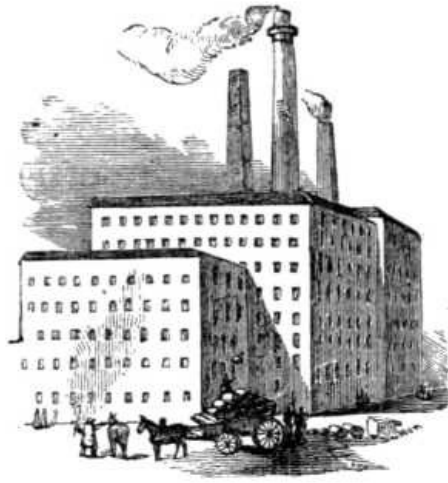
"Puffing Billy," in fact, humble as its pretensions were, has proved to have been the type of all locomotives since.

Had George Stephenson satisfied himself? No. His evenings were chiefly spent at home with his son Robert, now under him in the colliery, studying and discussing together how to evoke the hidden power yet pent up in "Puffing Billy." The son was even more sanguine than his father, and many an amendment had "Billy" to undergo to satisfy the quick intellect and practical judgment of the youth.

Mr. Stephenson, delighted with Robert's scientific tastes and skill, and ever alive to the deficiencies of his own education, was anxious to give him still further advantages. For this purpose he took him from a promising post at the colliery and sent him to the University of Edinburgh.

Here he enjoyed a six months' course of study; and so well prepared was he for it by his wellformed habits of application and thinking, that he gained in six months as much as many a student did in three years. Certain it was his father felt amply repaid for the draft it made on his purse, when Robert reappeared at the cottage in the spring, with a prize for successful scholarship in mathematics. He was eighteen then.





## CHAPTER IV.

### TWO CITIES THAT WANTED TO GET NEAR EACH OTHER—A NEW FRIEND.

Manchester, thirty miles south-east of Liverpool, is the great centre of our cotton trade. Its cloths are found in every market in the world. Cotton coming to Liverpool is sent to the Manchester mills, and the goods which the mills turn out are returned to Liverpool to be shipped elsewhere. The two cities, therefore, are intimately connected by constant intercourse and mutual interest.

Two water communications existed between them: one by the rivers Mersey and Irwell, the other by the famous Bridgewater Canal, which did an immense business at an enormous profit. But the Manchester mills were fast outgrowing these slow and cumbersome modes of travel. Liverpool warehouses were piled with bales of cotton waiting to go, and the mills at Manchester had often to stop because it did not come. Goods also found as much difficulty in getting back. Merchants and manufacturers both grumbled. Business was in straits. What was to be done? Carting was quite out of the question. Canal owners were besought to enlarge their water power. No, they would do nothing. They were satisfied with things as they were. Their dividends were sure.

But want demands supply. Need creates resources. Something *must* be done to facilitate the transit of goods between the two cities. What? Build a tramroad, or a *railroad*. Nobody, however, but a very fast man would risk his good sense by seriously advising a railroad. Prudent men would certainly shun him. A tramroad was a better understood thing. The collieries had used small pieces of them for years. A tramroad then. Business men put their heads together, and began earnestly to talk of a tramroad.

Edward James, a rich and enterprising man, entered heartily into the project, and undertook to make surveys for a suitable route. And not long after a party of surveyors were seen in the fields near Liverpool. Their instruments and movements excited attention. People eyed them with anxiety: suspicions were roused: the inhabitants became alarmed. Who were they, making such mysterious measurements and calculations on other people's land? A mob gradually gathered, whose angry tones and threatening gestures warned the surveyors of a storm brewing over their heads. Wisely considering that flight was better than fight, they took themselves off, and by-and-by turned up farther on.



The landowners, who might be supposed to have known better, told the farmers to drive them off; and the farmers, with their hands, were only too ready to obey. They stationed themselves at the field gates and bars with pitchforks, rakes, shovels, sticks, and dared the surveyors to come on. A poor chain-man, not quite as nimble as his pursuers, made his leap over a fence, quickened by a pitchfork from behind. Even women and children joined the hue and cry, pelting the strangers with stones and dirt whenever they had a chance. The colliers were not behind the farmers in their foolish hostility. A stray surveyor was caught and thrown into a pond.

At a sight of the theodolite their fury knew no bounds. That unoffending instrument they seemed to regard as the very stronghold of the enemy, to seize and destroy which was to win the day. The surveyors, therefore, hired a noted boxer to carry it, who could make good his threats on the enemy. A famous fighter among the colliers, determined not to be outdone, marched up to the theodolite to capture it. A fight took place; the collier was sorely beaten, but the rabble, taking his part against the poor instrument, pelted it with stones and smashed it to pieces.

You may well suppose that surveying under such circumstances was no light matter. What was the gist of the hostility? It is hard to tell. The canal owners might have had a hand in scattering these wild fears; fears of what, however, it is not so easy to find out. There was nothing in a simple horse railroad, or tramroad, as it is called, to provoke an opposition so bitter from the people. It was a *new thing*; and new things, great improvements as they may be on old ones, often call up a thousand doubts and fears among the ignorant and unthinking.

Nor did the project generally secure the approval of those who would be most benefited by it. Mr. James and his friends held public meetings in all the towns and villages along the way, enterprising men in Liverpool and Manchester delivered speeches, and tried to create a public interest; but there was a holding back, which, while it checked all actual progress in the enterprise, did not cause it to be altogether given up. The time had not come. That was all.

Mr. James had a secret leaning towards the use of steam on the new road. He would have immediately and unhesitatingly advocated a railroad run by locomotives. But that was out of the question. The public were far behind that point, and to have openly advocated it would have risked his judgment and good sense in the opinion of the best men. Therefore Mr. James held his tongue. But hearing of the Killingworth locomotives, and a collier who had astonished the natives by his genius, he determined to make a journey to Newcastle, and see the lions for himself.

Stephenson was not at home. "Puffing Billy" *was*, and "Billy" puffed in a way that took Mr. James's heart at once. He seemed to see at a glance "Billy's" remarkable power, and was struck with admiration and delight. "Here is an engine," he exclaimed, "that is destined before long to work a complete revolution in society."

The image of "Puffing Billy" followed him home.

"Why," he wrote to Stephenson's partner in the patent, "it is the greatest wonder of the age, and the forerunner, I believe, of most important changes in the modes of travel in the kingdom."

A few weeks later he made another visit to Killingworth, taking his two sons with him. "Puffing Billy" was at work as usual.

The boys were frightened at the sight of the snorting monster; but Stephenson encouraged them to mount with their father, and see how harmless and manageable the giant was.

The second visit was even more gratifying than the first.

"Mr. Stephenson," said James, "is the greatest practical genius of the age. His fame will rank with that of Watt."

Mr. James lost all hesitation now about speaking his mind. "Puffing Billy" had driven the backwardness out of him, and he was willing, at all hazards, boldly to advocate railroads and the steam-horse. No more tramroads; steam or nothing. This was in 1821.

Mr. James entered heart and soul into the new idea of the age. On his return to Liverpool it was everywhere his theme; and wherever he had influence he tried to stir up men's minds to the benefits and blessings puffing out in "Puffing Billy."

Stephenson rejoiced in such a friend. It was just what he and "Billy" most needed—somebody to introduce them into the great world. And Stephenson and his partner offered him a share in the profits of whatever business he could secure to them.

But what can one man, or a few men, do in an enterprise like this, depending upon the verdict of that important power—Public Opinion? And public opinion had not yet made up its mind to it.

A thousand difficulties bristled in the way; there was both the indifference of friends and the opposition of enemies at home. In addition to this, a violent opposition was foreseen in Parliament, which it needed all the strength and courage of a united constituency to meet.

Under these discouraging circumstances there were not enough men of courage to push the matter through.

So everything about the new road was laid on the shelf, at least for the present, and Liverpool and Manchester trade jogged on as before.



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## CHAPTER V.



## HUNTING UP HIS OWN WORK—AN ENTERPRISING QUAKER—WHAT WAS THE RESULT?

It appears strange to us that so simple a thing as the laying of a rail or the making of a tunnel seems to be, should have taken years of thought and experiment to do it. Nothing looks easier to have done than the straight smooth track of a railway, such as we now see in use; and yet it was only arrived at by slow steps through two hundred years.

In pondering upon the powers of "Puffing Billy," George Stephenson saw that the efficiency of locomotives must, in a great measure, depend upon what kind of roads they had to run upon. Many were sanguine that steam-carriages would some day come into use on common roads. After a long series of experiments George Stephenson said, "No, the thing wouldn't pay." For a rough surface seriously impairs the power of a locomotive; sand scattered upon the rails is sufficient to slacken and even stop an engine. The least possible friction is desirable, and this is found on the smooth rail.

Could they ever be laid up hill, or on "ascending gradients," as the scientific term is? No; as nearly level as possible, Stephenson's experiments showed, was the best economy of power. Then how to get rid of the jolts and jars and breakages of the rails as they were then laid? He studied and experimented upon both chairs and sleepers, and finally embodied all his improvements in the colliery railway.

"Puffing Billy" was in every respect a most remarkable piece of machinery, and its constructor one of the most sagacious and persistent of men; but how was the public, ever slow in discovering true merit, or accepting real benefits, to discover and appreciate them? Neither influence, education, nor patronage had Stephenson to command mind and means, or to drive his engine through prejudice, indifference, and opposition to profit and success.

But what he could not do other men could do and did do. Yes, there were already men of property and standing ready to listen to a new idea. While he worked they talked. As yet unknown to each other, but each by himself clearing the track for a grand junction.

One of these wide-awake men was Mr. Edward Pease, a rich "Friend," of Darlington, who, his friends said, "could look a hundred miles ahead." He needed a quicker and easier transit for his coal from the collieries north of Darlington to Stockton, where they were shipped; and Mr. Pease began to agitate, in his mind, for a railroad. A company for this purpose was formed chiefly of his own friends, whom he fairly talked into it. Scarcely twenty shares were taken by the merchants and shipowners of Stockton, whose eyes were not yet open to the advantage it would by-and-by be to them. A survey of the proposed road was made, when to the indifference of the many was added the opposition of the few. A duke was afraid for his foxes. Shareholders in the turnpikes declared it would ruin their stock. Timid men said it was a new thing, and it was best to let new things alone. The world would never improve much under *such* counsel. Mr. Pease was hampered on all sides. Nobody convinced him that his first plan was not the right one; but what can a man do in any public enterprise without supporters? So he reluctantly was obliged to give up his railroad, and ask parliament for liberty to build a tramroad—horse-power instead of steam-power; he seemingly could do no better, and even this was obtained only after long delay and at considerable cost.

Among the thousands who carelessly read in the newspapers the passage through parliament of the Stockton and Darlington Act, there was one humble man whose eye kindled as he read it. In his bosom it awakened a profound interest. He went to bed and got up brooding over it. He was hungry to have a hand in it; until at last, yearning with an irrepressible desire to do his own work in the world, he felt he must go forth to seek it.

One night a couple of strangers knocked at the door of Mr. Edward Pease's house in Darlington, and introduced themselves as two Killingworth colliers. One of them handed the master of the mansion a letter of introduction from a gentleman of Newcastle, recommending him as a man who might prove useful in carrying out his contemplated road.

To support the application a friend accompanied him.

The man was George Stephenson, and his friend was Nicholas Wood. It did not take long for Edward Pease to see that Stephenson was precisely the man he wanted.

"A railway, and not a tramroad," said Stephenson, when the subject was fairly and fully opened.

"A horse railway?" asked Mr. Pease.

"A locomotive engine is worth fifty horses," exclaimed Stephenson; and once on the track, he launched out boldly in its behalf.

"Come over to Killingworth, and see my 'Puffing Billy,'" said George; "seeing is believing." And Mr. Pease, as you may suppose, was quite anxious to see a machine that would outstride the fleetest horse. Yet he did not need "Puffing Billy" to convince him that its constructor knew what he was advocating, and could make good his pledges. The good Quaker's courage rapidly rose. He took a new start, and the consequence was that all other plans and men were thrown aside, and Stephenson was engaged to put the road through much in his own way.

The first thing to be done was to make an accurate survey of the proposed route. Taking Robert

with him, who had just come from college, and entered as heartily into the enterprise as his father, with two other tried men, they began work in good earnest. From daylight till night the surveyors were on duty. One of the men going to Darlington to sleep one night, four miles off.

"Now, you must not *start* from Darlington at daybreak," said Stephenson, "but be here, ready to begin work, at daybreak." He and Robert used to make their home at the farm-houses along the way, where his good-humour and friendliness made him a great favourite. The children loved him dearly; the dogs wagged their approving tails at his approach; the birds had a delighted listener to their morning songs; and every dumb creature had a kind glance from his friendly eye.

But George was not satisfied until Mr. Pease came to Killingworth to see "Puffing Billy," and become convinced of its economical habits by an examination of the colliery accounts. He promised, therefore, to follow George thither, bringing with him a large capitalist; and over they went in the summer of 1822.

Inquiring for George Stephenson, they were directed to the cottage with a stone dial over the door. George drove his locomotive up, hoisted in the gentlemen, harnessed on a heavy load, and away they went. George no doubt showed "Billy" off to the best advantage. "Billy" performed admirably, and the two wondering passengers went home enthusiastic believers in locomotive power.



A good many things had to be settled by the Darlington project. One was the width of the gauge, that is, the distance between the rails. How wide apart should they be? Stephenson said the space between the cart and waggon wheels of a common road was a good criterion. The tramroads had been laid down by this gauge—four feet and eight inches—and he thought it about right for the railway; so this gauge was adopted.

One thing which hampered Stephenson not a little was a want of the right sort of workmen—quick-minded, skilful mechanics, who could put his ideas into the right shape. The labour of originating so much we can never know. He had nothing to copy from, and nobody's experience to go by. Happily he proved equal to his task. We can readily imagine his anxiety as the work progressed. Hope and fear must have in turn raised and depressed him. Not that he had any doubts in regard to the final issue of the grand experiment of railroads—they *must* go.

Dining one day at a small roadside house with Robert and John Dixon, after walking over the route, then nearly completed, "Lads," he said, "I think you will live to see the day when railroads will be the great highway for the king and all his subjects. The time is coming when it will be cheaper for a working-man to travel on a railway than to walk on foot. There are big difficulties in the way, I know; but it will surely come to pass. I can hardly hope to live to see that day, much as I should like to; for I know how slow all human progress is, and how hard it is to make men believe in the locomotive, even after our ten years' success in Killingworth."

While the father roughed it through, Robert's health failed. His close application to business made sad inroads upon a frame naturally more delicate than his father's, and an offer to go out and superintend some mining operations in South America was thankfully accepted, in the hope that a sea voyage and less exciting labours might restore him.

Robert shortly sailed; and his father pushed on alone, with that brave spirit which carried him through many a darker hour.

On the 27th of September the Stockton and Darlington railway was finished and opened. A great many came to see the new mode of travelling, which had proved a fruitful subject of talk, far and near, for many months: some to rejoice; some to see the bubble burst; some with wonder, not knowing what to think; some with determined hostility. The opposition was strong—old England against young England—the counter currents of old and new ideas.

The road ran from Stockton to Darlington, a distance of twelve miles, and thence to the Etherly

collieries; in all thirty-two miles.

Four steam-engines were employed, and two stationary engines, to hoist the trains over two hills on the route. The locomotives were of six-horse power, and went at the rate of five or six miles an hour. Slow as this was, it was regarded with wonder. A "travelling engine" seemed almost a miracle. One day a race came off between a locomotive and a coach running on the common highway, and it was regarded as a great triumph that the former reached Stockton first, leaving the coach one hundred yards behind.

The road was built for a freight road, to convey lime, coal, and bricks from the mines and kilns in the interior to the seaboard for shipment abroad. Carrying passengers was not thought of. Enterprise, however, in this direction took a new start. A company was soon formed to run two coaches on the rails between Darlington and Stockton by horse-power. Each coach accommodated six inside passengers, and from fifteen to twenty outside; was drawn by one horse, and went at the rate of nine miles an hour.

"We seated ourselves," said a traveller of those days, "on the top of the Defence coach, and started from Stockton, highly interested with the novelty of the scene, and of this new and extraordinary conveyance. Nothing could be more surprising than the rapidity and smoothness of the motion." Yet the coach was without springs, and jerked and jolted over the joints of the rails with a noise like the clinking of a millhopper.

"Such is the first great attempt to establish the use of railways," writes a delighted editor, "for the general purposes of travelling; and such is its success that the traffic is already great; and, considering that there was formerly no coach at all on either of the roads along which the railroad runs, quite wonderful. A trade and intercourse have arisen out of nothing, and nobody knows how."

Such was their small and imperfect beginning, we should say, now that railroads, improved and perfected, have fulfilled Stephenson's prediction, and have become the great highways of the civilized world.

These wonders stirred the enterprise of old Massachusetts. Bunker-hill monument was then being built, and built of Quincy granite. To make an easier and cheaper transit to the water, the company built a railway from the quarries to the wharf, a distance of three miles, whence the blocks were carried in boats across the harbour to Charlestown. The rails were made of oak and pine, and the cars ran by horses. This was the first railroad in the United States.

The example of the monument building committee, and the success of the Stockton road, put the Boston people on a new track to get into the country. By the old modes of travel, the Connecticut river valley was very far off. Intercourse with the interior towns cost time and money. Going to Boston was a long and expensive journey. Of course there were not many journeys made, and no more trading than was absolutely necessary. Cheap and easy travelling was the need: Boston wanted what the country produced, and the country wanted what Boston merchants had to sell.

A canal was talked of, and routes surveyed. But nobody was sure it was the best thing, when English newspapers broached railroads. Ah, there it was; the best thing! Two advantages it had over a canal. A canal must only be a skating-ground for boys some months in the year, while a railway could be run winter and summer. It was also quicker and pleasanter for passengers. So, as early as 1827, the subject was stirring the minds of business men, and brought before the notice of the legislature. It was a horse-railway they were thinking of, and nothing more. It, however, came to nothing.

The first passenger railway in America, the Baltimore and Ohio, was opened for fifteen miles, in 1830, with horse-power; and the Mohawk and Hudson, from Albany to Schenectady, sixteen miles, was run with horses in 1831. A few months later the steam-horse, with its iron sinews, drove them off, never to yield the right of way again.





## CHAPTER VI.

### THE TWO CITIES TRYING AGAIN—BUGBEARS.

One, two, three years passed by, and the Liverpool and Manchester project started up again. It was not dead, it had only slept; and the three years had almost worn out the patience of both merchants and manufacturers. Trade between the two cities must have speedier and easier transit. Trade is one of the great progressive elements in the world. It goes ahead. It will have the right of way. It will have the right way—the best, safest, cheapest way—of doing its business. Yet it is not selfish: its object is the comfort and well-being of men. To do this it breaks down many a wall which selfishness has built up. It cuts through prejudices. It rides over a thousand "can't bes" of timid and learned men. For learned men are not always practical. They sometimes say things cannot be done when it only needs a little stout trying to overcome difficulties and do them.

A learned man once said crossing the Atlantic by steam was impossible.

"For the good of the race we must have something truer than wind and tougher than sails," said trade. And it was not many years before ships steamed into every port.

"Carriages travelling at twelve, sixteen, eighteen, twenty miles an hour! Such gross exaggerations of the power of a locomotive we scout—it can never be!" cries a sober Quarterly.

"You may scout it as much as you please," rejoins trade; "but just as soon as people need cheaper, pleasanter, swifter modes of travel, it will be *done*;" and now the railroad threads the land in its arrowy flight.

"The Magnetic Telegraph!—a miserable chimera," cries a knowing member of parliament. "Nobody who does not read outlandish jargon can understand what a telegraph means."

"You will soon find out," answers trade; and now it buys flour by the hundred barrels, and sells grain by the thousand bushels, while fleets sail at its bidding, treaties are signed at its word, and the telegraph girdles the world.

You see trade is a civilizer, and Christian civilization makes all the difference in the world between Arabs and Englishmen.

Liverpool merchants were now fairly awake. "What is to be done?" was the question. Something. Could there be a *third* water-line between the two cities? No; there was not water enough for that.

Would the Bridgewater Canal increase its power, and reduce its charges? No.

A tramroad or railroad, then; there was no other alternative.

Mr. James, who was so much interested before, had failed and left the country. When he left he said to his friends, "When you build a road, build a railroad, and get George Stephenson to do it."

The Darlington and Stockton enterprise could not fail to be known at Liverpool, and a drift of opinion gradually began to set strongly in favour of the railway. People talked about it in good earnest.

"A railway!" cried the canal owners, "it is absurd—it is only got up to frighten us; it will fall through as it did before." They were easy.

"Let us go to Darlington and Killingworth, and see for ourselves," said the merchants; and four gentlemen were sent on a visit of inquiry. They went first to Darlington, where the works were in vigorous progress, though not done. It was in 1824, the year before they were finished. Here they met Stephenson. He took them to Killingworth to see "Puffing Billy."

Seeing was believing. "Billy's" astonishing feats won them completely over, and they went back to

Liverpool warm for a railroad. Their clear and candid report convinced merchants, bankers, and manufacturers, who gave a verdict in its favour. Public opinion was now coming over.

Books were opened for funds. There was no lack of subscribers. Money was ready. To be sure of the *safety* of locomotive power, a second deputation was sent to Killingworth, taking with them a practical mechanic, better able to judge about it than themselves. The man had sense enough to see and to own that while he could not ensure safety over nine or ten miles an hour, there was nothing to be afraid of slower than that. Then a third body went. The enterprise required caution, they thought.

Yes, it did.

Having decided upon steam power, the next thing was to secure the right sort of man to carry on the work. Stephenson was that man. His energy and ability were indispensable. Before trying to get an act of parliament, the route needed to be surveyed again, and a careful estimate of expenses made.

The Stockton road done, Stephenson was free to engage in this new enterprise, his success in that proving his principles true on a larger scale.

The canal owners now took alarm. They saw there was a dangerous rival, and they came forward in the most civil and conciliatory manner, professing a wish to oblige, and offering to put steam power on their canals. It was too late. Their day had gone by.

You know the violent opposition made to a former survey. How would it be again? Did three years scatter the ignorance out of which it grew? Ah, no. There was little if any improvement. The surveyors were watched and dogged by night and by day. Boys hooted at them, and gangs of roughs threatened them with violence. Mr. Stephenson barely escaped duckings, and his unfortunate instruments capture and destruction. Indeed, he had to take with him a body-guard to defend them. Much of the surveying had to be done by stealth, when people were at dinner, or with a dark lantern at night.

When dukes and lords headed the hostility, you cannot wonder that their dependents carried it on. One gentleman declared he would rather meet a highwayman or see a burglar on his premises than an engineer; and of the two classes, he thought the former the most respectable! Widows complained of damaged corn-fields, and gardeners of their violated strawberry beds; and though Stephenson well knew that in many cases not a whit of damage had been done, he paid them for fancied injuries in hope of stopping their tongues.

A survey made under such circumstances must needs have been imperfect, but it was as good as could be made. And no time was lost in taking measures to get a bill before parliament.

A storm of opposition against railways suddenly arose, and spread over every corner of the kingdom. Newspapers and pamphlets swarmed with articles crying them down. Canal and turnpike owners spared no pains to crush them. The most extraordinary stories were set afloat concerning their dangers. Boilers would burst, and passengers be blown to atoms. Houses along the way would be burnt; the air would become black with smoke and poisoned with cinders, and property on the road be stripped of its value.

The Liverpool and Manchester bill, however, got into parliament, and went before a committee of the House of Commons to decide upon it, in March, 1825.

First its friends had to show the *necessity* of some new mode of travel between the two cities, and that it was not difficult to do.

But when it came to asking for liberty to build a railway and run a locomotive, the matter was more difficult to manage. And to face the tremendous opposition leagued against it, the courage of its friends was severely tried.

The battle had to be fought inch by inch.

Stephenson of course was the chief witness for locomotives. But what headway could he, an uneducated Northumbrian mechanic, make against members of parliament, backed by all the chief engineers of the kingdom. For very few had faith in him; but those few had strong faith. He was examined and cross-examined. They tried to bully him, to puzzle him, to frighten him. On the subject of locomotives his answers were clear. He declared he could drive an engine, and drive it safely, at the rate of twelve miles an hour!

"Who can believe what is so notoriously in the teeth of all experience?" cried the opposition; "the witness is a madman!"

Famous engineers were called as witnesses. What had *they* to say? One declared the scheme a most wild one. He had no confidence in locomotives. They were affected by the wind, the weather; with difficulty were kept on the track, and were liable to constant accidents; indeed, a gale of wind would render it impossible to start a locomotive, either by poking the fire or keeping up the steam till the boiler should burst: they could never be relied on.

The proposed route had to cross an ugly quagmire, several miles in extent, called Chat Moss, a very shaky piece of land, no doubt; and here the opposition took a strong stand. "No engineer in his senses," cried one, "would think of going through Chat Moss. No carriage could stand on the Moss short of the bottom."

"It is absurd to hold out the notion that locomotives can travel twice as fast as stage-coaches," says another; "one might as soon trust himself to a rocket as to the mercy of a machine going at that rate."

"Carriages cannot go at anything like that speed," added another; "if driven to it, the wheels would only spin on their axles like a top, and the carriages would stand stock-still!"

So much for learned arguments against it.

Then came the dangers of it. The dumb animals would never recover from the sight of a locomotive; cows would not give their milk; cattle could not graze, or horses be driven along the track, cried the opposition.

"As to that," said Stephenson, "come to Killingworth and see. More quiet and sensible beasts cannot be found in the kingdom. The farmers *there* never complain."

"Well," asked one of them, "suppose, now, one of those engines to be going along a railroad at the rate of nine or ten miles an hour, and that a cow were to stray upon the line and get in the way of the engine; would not *that*, think you, be a very awkward circumstance?"

"Yes," answered Stephenson, with a droll twinkle in his eye, "very awkward indeed—for *the cool!*"

The inquirer, as you may suppose, was silent.

The danger in other respects was thus dwelt on: "In addition to the smoke and the noise, the hiss and the whirl, which locomotive engines make going at the rate of ten or twelve miles an hour, and filling the cattle with dismay, what," asked an honourable member, "is to be done with all those who have advanced money in making and mending turnpikes? What with those who may still wish to travel in their own or hired carriages, after the fashion of their forefathers? What is to become of coach-makers and harness-makers, coach-masters and workmen, innkeepers, horse-breeders, and horse-dealers? Iron would be raised one hundred per cent., or more probably exhausted altogether. The price of coal would be ruinous. Why, a railroad would be the greatest nuisance, the biggest disturbance of quiet and comfort, in all parts of the kingdom, that the ingenuity of man could invent."



Not content with decrying his engine, they could not stop short of abusing Stephenson himself. "He is more fit for Bedlam than anywhere else," they cried; "he never had a plan, he is not capable of making one. Whenever a difficulty is pressed, as in the case of a tunnel, he gets out of it at one end; and when you try to catch him at that, he gets out at the other."

"We protest," they said, "against a measure supported by such evidence and founded upon such calculations. We protest against the Exchange of Liverpool striding across the land of this country. It is despotism itself."

What had the friends of steam-power to say?

"We beseech you," they pleaded to the committee, "not to crush it in its infancy. Let not this country have the disgrace of putting a stop to that which, if cherished, may in the end prove of the greatest advantage to our trade and commerce. We appeal to you in the name of the two largest towns in England—we appeal to you in the name of the country at large—and we implore you not to blast the hopes that this powerful agent, steam, may be called in aid for the purpose of land communication; only let it have a fair trial, and these little objections will be done away."

Flaws were picked in the surveys, and the estimate of costs based on them. The surveys, quite likely, were imperfect; indeed, how could they be otherwise, when every mile of the line had to be done at the risk of their necks?

The battle lasted two months, and a very exciting one it was. It was skilfully and powerfully carried on. Who beat?

*The opposition.* The bill was lost.

Matters looked dark enough. Judging from appearances the enterprise was laid on the shelf, and the day of railways long put off. As for poor Stephenson, his short day of favour seemed about

gone. His being called a madman and regarded as a fool, as he had been by the opposition, was not without its effect upon his newly-made friends. Their faith in him sensibly cooled. But he did not lose faith in himself, not he. He had waited long for the triumph of his engine, and he could wait longer. A great blessing to the nation was locked up in it he well knew, and the nation would have it some time, in spite of everything.

Was the enterprise a second time to be abandoned? No, no. Taking breath, its friends again started on their feet. Never give up, was their motto, for they were in earnest. They rallied, and met in London to consult what to do next.

Mr. Huskisson, a member of parliament for Liverpool, came into the meeting and urged them to try again—to try at the next session of parliament.

"Parliament must in the end grant you an act," he said, "if you are determined to have it." And try they determined to, for a horse railroad at least.

For this purpose another and more careful survey had to be made.

Stephenson was left out. A *known* man must be had. They meant to get surveyors and engineers with well-established reputations to back them up, Stephenson was too little known. He had no fame beyond a little circle in one corner of the kingdom. How did he feel to be thus thrown in the background? George was not a man to grumble; he was too noble to complain. In fact, you see, he was ahead of the times—too far ahead to be understood and appreciated. He could afford to wait.

Two brothers by the name of Rennie were appointed in his stead. In time the new survey was finished, the plans drawn, and the expense reckoned up. Changes were made in the route. Ill-tempered land-owners were left on one side, and every ground of complaint avoided that could be.

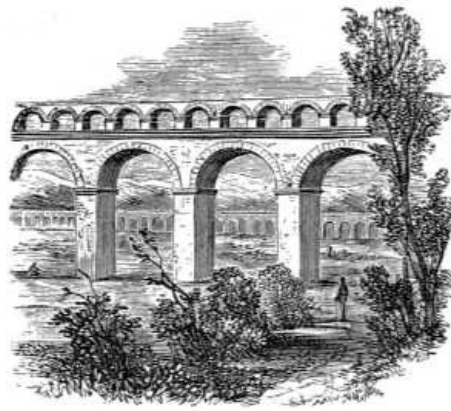
The new bill was then carried to parliament, and went before the committee in March the next year. The opposition was strong indeed, but less furious. Much of its bitterness was gone. It made a great show of fears, which the advocates of the bill felt it was not worth while to waste words in answering. They left it to the road to answer them. Build it, and see.

Mr. Huskisson and others supported it in a strong and manly tone, and after a third reading the bill passed in the House of Commons. So far so good. It then had to go to the House of Lords. What would befall it there? The same array of evidence on both sides was put forward. The poor locomotive engine, which had proved such a bugbear in the House of Commons, was regarded as quite a harmless affair by most of the lords; and the opposition made such poor work in showing off its dangers that no plea in its behalf was called for. They were satisfied, they said, and the bill passed almost unanimously, Victory! Victory!

The victory cost more than four thousand five pound bank-notes! For a first cost it looked large. But nothing worth doing can be done without effort, and effort made *on faith*. Nothing done, nothing have.







## CHAPTER VII.

### GRAPPLING WITH DIFFICULTIES—THE BOG—A PUZZLE—THE PRIZE OFFER.

The real work was now to be done. Hopes and fears had yet to be verified.

At the first meeting of the directors, a man to put the enterprise through was to be chosen. Who? The Rennies were anxious to get the appointment. They naturally expected it. They had made the survey, and their name had had weight in getting the Act of Parliament. But they could not superintend the details of the work. They had other enterprises on foot.

Stephenson, no doubt, was *the* man. The directors felt him to be so. No one could long be with him without feeling his power. Besides, what he had done had been ably done. At the risk of offending the Rennies and their friends, they chose him, and the result proved the wisdom of their choice.

On receiving the appointment, he immediately moved to Liverpool, and the work began in good earnest. It was a stupendous undertaking for those days. Chat Moss had to be filled in, sixty-three bridges built, excavations made, tunnels erected, and all the practical details carried out, with very little past experience to profit by. Neither was the kind of labour well understood, nor was there that division of labour between contractors and engineers which relieves one man of too heavy a responsibility. In fact, both tools and men had to be made, and Stephenson had to do it.

The great quagmire was first grappled with. "No man in his senses would undertake to make a road over Chat Moss," opposers said in parliament: "That was to undertake the impossible." Stephenson, however, meant to try. Formidable it certainly was. Cattle ploughing on farms bordering the bog, where it ran underneath the tilled land, had to wear flat-soled boots in order to keep their hoofs from sinking down into the soft soil.

The proposed route ran four miles across it, and the way had to be drained and filled in with sand and gravel. The drainage tasked their ingenuity to the utmost, and almost baffled the workmen. After that was in some degree accomplished, waggon after waggonful of earth was thrown on for weeks and weeks, and it only sank into the mire and disappeared—not an inch of solid footing seemed gained; and on they went, filling and filling, without apparently having made the least impression on the Moss: the greedy bog only cried out for more.

Stephenson's men began to have their doubts. The opposition might have judged more correctly, after all. They asked him what he thought. "Go ahead," was his answer. By and by the directors began to have *their* fears. It looked to them like a very unpromising job. So it was. After waiting and waiting in vain for signs of progress, they called a meeting on the edge of the Moss, to see if it were not best to give it up as a bad job. The bog, they were afraid, might swallow up all their funds, as it had everything else. Stephenson lost not a whit of his courage. "Go ahead," was his counsel. He never for a moment doubted of final success. And considering the great outlay already made, they wisely gave in to him.

Monstrous stories were afloat of the terrible accidents taking place there. Every now and then the drivers of the coaches brought into Manchester the astonishing news of men, horses, carts, and Stephenson himself submerged and sunk for ever in the insatiable quagmire. Time corrected one only to publish another. Newsmongers were kept in a state of delightful excitement, and tea-table gossip was spiced to suit the most credulous and marvel-loving taste, until the Moss was conquered, as conquered it was acknowledged to be, when, six months after the directors had met to vote to leave it to its original unproductiveness, they were driven over it on a smooth and secure rail to Manchester.

Another tough job was tunnelling Liverpool; excavating a mile and a third of road through solid rock. Night and day the boring, blasting, and hewing were kept in vigorous execution. Sometimes the miners were deluged with water, sometimes they were in danger of being overwhelmed by heavy falls of wet sand from overhead. Once, when Stephenson was gone from town, a mass of loose earth came tumbling on the heads of the workmen, frightening them, if nothing more. On

his return they were in a most refractory state, complaining of the dangers, and stoutly refusing to go back to work. Wasting no time on words, Stephenson shouldered a pickaxe, and called for recruits to follow. Into the tunnel he marched, and the whole gang after him. Nothing more was heard of fears, and the work went bravely on.



Besides laying out all the work, Stephenson had to make his tools. All their waggons, trucks, carriages, switches, crosses, signals were planned and manufactured under his superintendence, besides meeting and providing for a thousand exigencies constantly occurring in a new enterprise like this, giving full scope to all the sagacity, invention, and good-humour which naturally belonged to him.

The expenses of the road were heavy, and money was not always forthcoming. If the works lagged in consequence of it, the hopes of the directors fell; so that Stephenson's energies were taxed to the utmost during the four years of the work, and he showed, what observation and history both teach us, that efficient men are men of *detail*, as well as men of great plans.

Remember this, boys—for we sometimes despise little particulars, and the day of small things—that the secret of effective doing lies not only in making wise plans, but in filling up the minutest parts with promptness and fidelity. There must be detail to achieve any great and good work. If you would possess the fruits of learning, you must get them by the toil of daily drudgery. If you undertake to become rich, you must not despise the small gains and little economies by which a fortune is made. If you would obtain a noble Christian manhood, you must not neglect hourly self-restraint, watchfulness, and prayer, or the daily exercise of those humbler virtues and godly industries which make the woof of character.

Stephenson strikingly illustrated the practical force of this principle. The minutest detail of every plan in this new enterprise was thought out and carried on by himself, or under his direct supervision. Both in summer and winter he rose early. Before breakfast you might find him on a morning round, visiting the extensive workshops where their machines and tools were made. Or perhaps "Bobby" is brought to the door, and, mounted on this his favourite horse, he is off fifteen miles to inspect the progress of a viaduct, a ride long enough to whet the appetite for a tempting breakfast, one would think. But nothing tempts him from his frugal habits; he eats "crowdie," and that made by himself, which is nothing more or less than oatmeal hasty-pudding and milk. Again he is off, inspecting the labours of his men all along the line from point to point, pushing the works here, advising there, and inspiring everywhere. "Bobby" is a living witness that one beast at least is not to be scared by a locomotive. He can face the snorting monster without so much as a shy step or a prick of the ears. *He* afraid? not "Bobby."

Returning home, bills are to be examined perhaps, when every item of expense must be accounted for; or drawings are to be made, or directions given, or letters written.

Several young men were received into his family, to be trained for engineers. A second wife, frugal, gentle, and friendly, superintended his household. Their evenings were passed in study and conversation, brightened by the genial humour of the remarkable man whose genius drew them together, and whose good-tempered pleasantries relieved the heavier tasks of mind and body. The compendium of all his instructions was, Learn for yourselves; think for yourselves; master principles; persevere; be industrious, and there is no fear for you. It is an indication of the value of these instructions that every young man trained under him rose to eminent usefulness. "Ah," he sometimes said, on relating a bit of his own early history, "you don't know what work is, these days." And yet work is work, all the world over.

In spite of the best Stephenson could do, the directors, looking at their unproductive capital, and not fully comprehending all the difficulties to be overcome, sometimes urged greater despatch.

"Now, George," said Friend Cropper one day, "thou must get on with the railway; thou must really have it opened by the first of January next."

"Consider the heavy nature of the works, sir," rejoined George, "and how much we have been delayed by want of money, to say nothing of the bad weather. The thing is impossible."

"Impossible!" cried Cropper; "I wish I could get Napoleon to thee; he would tell thee there is no such word as 'impossible.'"

"Tush!" exclaimed George, "don't tell me about Napoleon. Give me men, money, and material, and I'll do what Napoleon couldn't do—drive a railroad over Chat Moss."

He might have retorted, more significantly, by asking the directors what *they* meant to do; for Liverpool was tunnelled, and Chat Moss railed, before they could agree what kind of power to put on it. There were some who insisted upon using horse-power; but the majority thought that was out of the question. Meeting after meeting was held, debate followed debate, and the whole body became more and more puzzled as the road itself neared completion.

Some kind of machine, but *what?* Ah, that was the question. You would naturally have thought a locomotive, of course. But no; since parliamentary opposition raged against it, steam had lost ground in the public estimation, and it was very slow in getting back to favour. Locomotives, or travelling engines, as they were called, were hid in a cloud of doubts; and more than ever since the parliamentary debates. They were dangerous, they were frightful, "they could never go fast enough," their utmost speed would not be ten miles an hour. Some of the most distinguished engineers would give no opinion of them at all. They had none. It was certainly hard to patronize them, in spite of their indifference, and possibly their sneers. Certainly, if the poor locomotive depended upon their verdict its fate was sealed.

One staunch friend remained. Stephenson stood faithfully by "Puffing Billy," puffing away in his far off Northumberland home. He never flinched advocating its principles, and urged the directors to try one on the road. They at last ordered one to be built, one that would be of service to the company, and no great nuisance to the public. It was built, and excellent service it did, drawing marl from the cuttings and excavations to fill up the bogs and hollows. Nevertheless, it settled nothing, and convinced nobody not already convinced.

Meanwhile the directors were deluged with projects, plans, and advice for running their road. Scheme upon scheme was let loose upon them. Some engines to go by water-power; some by gas; some by cog-wheels. All the engineering science in the kingdom was ready to engineer for them in its own way; but who among all could pronounce the best way, and, upon the whole, decide which was the right motive power?

A deputation was despatched to Darlington and Stockton to inspect the fixed and locomotive engines employed on that road. But the deputation came back differing so among themselves that the directors were more puzzled than ever. Two professional engineers of high reputation were then sent, who on their return reported in favour of *fixed engines*: for safety, speed, economy, and convenience, fixed engines by all means; reiterating again and again all the frightful stories of danger and annoyance charged upon steam. They proposed dividing the road into nineteen stages, of a mile and a half in length, and having twenty-one stationary engines at different points to push and draw the trains along. The plan was carefully matured.

Poor Stephenson! how did he feel? "Well," he said, with the calm earnestness of a man of faith, "one thing I know, that before many years railroads will become the highways of the world."

Could the directors accept a project without consulting him? Again they met. What had he to say concerning it? Fight it he did. He dwelt upon its complicated nature, the liability of the ropes and tackling to get out of order, the failure of one engine retarding and damaging and stopping the whole line—a phase of the matter which did not fail to make an impression. The directors were moved. Friend Cropper, however, headed the stationary-engine party, and insisted upon adopting it. "But," answered the others, "ought we to make such an outlay of money without first giving the locomotive a fair trial?" And Stephenson pleaded powerfully, as you may suppose, in its behalf. "*Try it, try it,*" he urged; "for speed and safety there is nothing like it." And the words of a man with strong faith are strong words. "Besides," he said, "the locomotive is capable of great improvements. It is young yet; its capacities have never been thoroughly tested. When proper inducements are held out, a superior article will be offered to the public."

Never were directors in a greater strait. There was no withstanding Stephenson, for he knew what he was talking about. All the rest were schemers. At last one of the directors said, "Wait; let us offer a prize for a new locomotive, built to answer certain conditions, and see what sort of engine we can get."

That was fair. It was right his engine should be properly tested. All agreed; and in a few days proposals were issued for the building of one. There were eight conditions, two of which were, that if the engine were of six tons' weight it should be able to draw twenty tons at a speed of *ten* miles an hour. The prize was five hundred pounds.

The offer excited a great deal of attention, and many people made themselves merry at its expense. The conditions were absurd, they said; nobody but a set of fools would have made them. It had already been proved impossible to make a locomotive engine go at ten miles an hour, and one gentleman in his heat even went so far as to say that if it ever *were* done, he would

undertake to eat a stewed engine wheel for his breakfast. As that condition was answered, it is to be hoped he was relieved from his indigestible dish.

More candid minds turned with interest to the development of this new force struggling into notice. Stephenson felt how much depended on the issue. And the public generally concluded to suspend its verdict upon the proper working of railways until time and talent gave them better means of judging.



## CHAPTER VIII.

### ROBERT'S RETURN—A CURIOUS ENCOUNTER—THE PRIZE ENGINE.

One step forward; yes, a great one too, Stephenson thought. His beloved locomotive was to have a chance of being properly introduced to the great English public; and he felt that it only needed to be known to be valued. The building of it was a matter of no small moment, and he wanted above all things a tried and skilful hand to superintend and put into its construction every conceivable improvement. It must be the best engine yet built.

Where should he find the right man? No one would answer like his son Robert, and Robert he determined to send for. Robert, you remember, went to South America three years before. There he had regained his health, and on receiving his father's letter made immediate preparations to return to England.

On his way, at a poor little comfortless inn, in a poor little comfortless seaport on the gulf of Darien, where he was waiting to take ship, he met two strangers, one evidently an Englishman, who by his appearance looked as if the world had gone hard with him. A fellow-feeling drew the young man towards his poor countryman, and on inquiry, who should it prove to be, but the old Cornwall tin-miner, Captain Trevethick, whose first steam-carriage awoke so much curiosity in London nearly a quarter of a century before.

He had sown his idea to the winds. Others had caught it up, cherished it, pondered over it, examined it, dissected it, improved it, embodied it, and by patient study and persistent endeavour

had reduced it to a practical force. And Robert Stephenson was now on his way to inaugurate it as one of the great commercial values of the kingdom and of the world. The poor inventor, what had he done meanwhile? While others worked had he slept? Oh, no! He had tried an easier and shorter road to fame and fortune. You remember he left his "dragon," as some people called his locomotive, in London, quite careless what became of it, and went scheming and speculating in other things. Several years after, in a shop window, it attracted the attention of a French gentleman passing by. He was from Peru, and had just come to England to get a steam-engine for pumping water from some gold-diggings in the new world. Delighted with the model, he bought it for twenty guineas. Taking it with him to Lima, an engine was built on the plan of it, which worked admirably. The gentleman was then sent back to England to hunt up and bring out the inventor himself. The captain was found, and came forth from his obscurity into sudden notice and demand. The gentleman engaged him to make five pumping-engines according to his model, which he did, and shipped them to Lima, the captain himself soon following.

At Lima he was received with great honours, and a public rejoicing. A guard of honour was appointed to wait on him; and in view of the wealth he was supposed to be able to engineer from their mines, a massive silver statue of him, as the benefactor of Peru, began to be talked of.

Of course poor Trevethick thought his fortune made, and no doubt looked back with pity on his humble English life. Friends at home spread the news of his successes, and when they stated that the smallest estimate of his yearly income amounted to one hundred thousand pounds, no wonder he was pronounced a success! Tardier steps to fortune seemed tedious; and many of his old associates perhaps sighed over the wholesome toil of a slower-paced prosperity.

Years passed on, and the poor captain next turns up at Cartagena, penniless and pitiable. In crossing the country he had lost everything. Forging rivers, penetrating forests, and fighting wild beasts, had left him little else than a desire to reach England again; and Robert Stephenson gave him fifty pounds to help him home. Sudden fortunes are apt as suddenly to vanish; while those accumulated by the careful husbandry of economy, industry, and foresight reward without waste. So character is stronger than reputation. For one is built on what we are, the other on what we seem to be; and, like a shadow, reputation may be longer or shorter, or only a distorted outline of character. One holds out, because it is real; the other often disappears, because it is but shadow.

Robert reached home in December, 1827, right heartily welcomed, we may well believe, by his father, who was thankful to halve the burden of responsibility with such a son. To build the prize locomotive was *his* work.

Stephenson had long been a partner in a locomotive factory at Newcastle, which had hitherto proved a losing concern to the owners. There was little or no market for their article, and they struggled on, year after year, waiting for better times. Nobody saw better times but Stephenson. He saw them ahead, shooting through the gloomy clouds of indifference and prejudice. And now, he calculated, it was very near. So he sent Robert to Newcastle to take charge of the works there, and construct an engine that would make good all his words.

It was a critical moment, but he had no fears of the result. Robert often came to Liverpool to consult with his father, and long and interesting discussions took place between father and son concerning the best modes of increasing and perfecting the powers of the mechanism. One thing wanted was greater speed; and this could only be gained by increasing the quantity and the quality of the steam. For this effect a greater heating surface was necessary, and mechanics had long been experimenting to find the best and most economical boiler for high-pressure engines.

Young James, son of Mr. James, who, when the new Liverpool and Manchester route was talked of, was the first to discover and acknowledge George Stephenson's genius, made the model of an improved boiler, which he showed to the Stephensons. Perhaps he was one of the boys who went to Killingworth with his father to see the wonders of "Puffing Billy," and whose terrors at the snorting monster were only smoothed by a pleasant and harmless ride on his back. Whether this gave him a taste for steam-engines we do not know. At any rate, he introduces himself to our notice now, with a patented model of an improved boiler in his hand, which Stephenson thinks it may be worth his while to make trial of. "Try it," exclaimed the young inventor, "try it, and there will be no limit to your speed. Think of thirty miles an hour!"

"Don't speak of thirty miles an hour," rejoined Stephenson; "I should not dare talk about such a thing aloud." For I suppose he could hardly forget how parliamentary committees had branded him as a fool and a madman for broaching such beliefs.

The improved boiler was what is called a multitubular boiler. You do not understand that, I suppose. An iron boiler is cast, six feet long, and three feet and a third in diameter. It is to be filled half full of water. Through this lower half there run twenty-five copper tubes, each about three inches in diameter, opened at one end to the fire, through which the heat passes to the chimney at the other end. You see this would present a great deal of heating surface to the water, causing it to boil and steam off with great rapidity. The invention was not a sudden growth, as no inventions are. Fire-tubes serving this use started in several fertile minds about the same time, and several persons claimed the honour of the invention; but it was Stephenson's practical mind which put it into good working order, and made it available; for he told Robert to try it in his new locomotive.

He did. The tubes were of copper, manufactured by a Newcastle coppersmith, and carefully inserted into the ends of the boiler by screws. Water was put into the boiler, and in order to be

sure there was no leaking, a pressure was put on the water; when lo, the water squirted out at every screw, and the factory floor was deluged. Poor Robert was in despair. He sat down and wrote his father that the whole thing was a failure.

A failure indeed! Back came a letter by the next post telling him to "go ahead and try again!" The letter, moreover, suggested a remedy for the disaster—fastening the tubes into the boiler by fitting them snugly into holes bored for the purpose, and soldering up the edges. And it proved to be precisely what Robert himself had thought of, after the first bitter wave of disappointment had subsided. So he took heart and went to work again. Success crowned his efforts. A heavy pressure was put on the water, and not a drop oozed out. The boiler was quite water-tight.

This is precisely the kind of boiler now in use: some have fifty tubes; the largest engines one hundred and fifty.

Various other improvements were incorporated into the new engine, which, as you do not probably understand much about machinery, will not particularly interest you.

At last the new engine was finished. It weighed only four tons and a quarter, little less than two tons under the weight required by the directors. The tender, shaped like a waggon, carried wood in one end and water in the other.

It was forthwith put on the Killingworth track, fired up, and started off. Robert must have watched its operations with intense anxiety. Nothing could have met his expectations like the new boiler. It in fact outdid his highest hopes. The steam made rapidly, and in, what seemed to him then, marvellous quantities. Away went a letter to Liverpool that very evening.

"The 'Rocket' is all right and ready," wrote the young man joyfully. That was the engine's name, "Rocket," on account of its speed perhaps. "Puffing Billy" was quite cast into a shade.

It was shortly shipped to Liverpool in time for the grand trial.

The trial, rapidly approaching, elicited a great and general interest. The public mind was astir. The day fixed was the first of October. Engineers, mechanics, and scientific men, far and near, flocked to Liverpool. The ground where the exhibition was to take place was a level piece of railroad two miles long, a little out of the city. Each engine was to make twenty trips at a rate of speed not under ten miles an hour, and three competent men were appointed as judges.

Four engines were entered on the list, "THE NOVELTY," "SANS-PAREIL," "THE ROCKET," "PERSEVERANCE."

Several others were built for the occasion in different parts of the kingdom, or rather projected and begun, but were not finished in time.

In order to afford ample opportunity for their owners to get them in good working order, the directors postponed the trial to October 6th. The day arrived, and a glance at the country round showed that an unusual occasion was drawing people together. Multitudes from the neighbouring towns assembled on the grounds at an early hour. The road was lined with carriages, and a high staging afforded the ladies an opportunity of witnessing the novel race.

The "Novelty" and "Sans-pereil," though first on the list, were not ready at the hour appointed. What engine was? The "Rocket." Stephenson, next on the roll, was called for by the judges, and promptly the little "Rocket" fired up at the call. It performed six trips in about fifty-three minutes.

The "Novelty" then proclaimed itself ready. It was a light, trim engine, of little more than three tons weight, carrying its wood and water with it. It took no load, and ran across the course sometimes at the rate of twenty-five miles an hour. The "Sans-pareil" also came out.

The "Perseverance," not able to go faster than five or six miles an hour, withdrew from the contest. As the day was now far spent, further exhibition was put off till the morrow.

What exciting discussion must have taken place among rival competitors and their friends! What a scrutiny of the merits and demerits, the virtues and defects, of opposing engines!

Before the appointed hour the next day the bellows of the "Novelty" gave out, and as this was one of its merits—a bellows to increase the draft of the air-blast—its builders were forced to retire from the list.

Soon after a defect was discovered in the boiler of the "Sans-pareil." Mr. Hackworth begged for time to mend it; as there was no time, none could be granted, and he, too, withdrew his claims.

The "Rocket" alone stood its ground. The "Rocket," therefore, was called for. Stephenson attached to it a carriage large enough to hold a party of thirty, and drove his locomotive along the line at the rate of twenty-five and thirty miles an hour, to the amazement and delight of every one present.

The next morning it was ordered to be in readiness to answer the various specifications of the offer. It snorted and panted, and steamed over the race-ground in proud trim, drawing about thirteen tons weight. In twenty trips, backward and forward, its greatest speed was twenty-nine miles an hour, three times greater than Nicholas Wood, one of the judges, declared to be possible. Its average rate was fifteen miles, five miles beyond the rate specified for the prize. The performance appeared astonishing. Spectators were filled with wonder. The poor directors began to see fair weather; doubts were solved, disputes settled; the "Rocket" had cleared the track for them. There could no longer be any question how to run the road. George Cropper, who had

steadily countenanced stationary engines, lifted up his hands, exclaiming, "Stephenson has at last delivered himself!"

The two other locomotives, however, were allowed to reappear on the stage; but both broke down, and the "Rocket" remained victor to the last. It had performed, and more than performed, all it promised, fulfilled all the conditions of the directors' offer, and was accordingly declared to have nobly earned the prize, five hundred pounds.

But the money was little compared to the profound satisfaction which the Stephensons felt at this public acknowledgment of the worth of their life-long labours. George's veracity, skill, and intelligence had all been doubted, denied, and derided by men of all classes. Even old friends turned against him, and thought his mind was crazed by "one idea." He had to struggle on alone; faithful to his convictions, patiently biding his time, yet earnestly pleading his cause on every suitable occasion. He had a blessing for the world, and he knew when it felt its want of it, it would have it. That time had come. The directors flocked around him with flattering congratulations. All shyness and coolness vanished. Friends were no longer few. The shares of the company immediately rose ten per cent. Men and means were at his disposal. George Stephenson was a happy man.

The "Rocket" had blown stationary engines to the winds. And steam that day, on the land as well as the water, took its place as one of the grand moving powers of the world.



## **CHAPTER IX.**

### **OPENING OF THE NEW ROAD—DIFFICULTIES VANISH—A NEW ERA.**

There was no more waiting for work at the locomotive factory in Newcastle. Orders immediately arrived from the directors to build eight large engines for the new road, and all the workshops were astir with busy life. The victorious little "Rocket" was put on the road, and sensibly helped to finish it. Neither faith, men, nor means were now wanting, and the labour in every part went heartily on.

In June a meeting of the directors was held in Manchester, when the "Rocket" made a trip from Liverpool to that city with a freight and passenger train, running through in two hours. Chat Moss never quivered; and the directors, I daresay, would have been very glad to forget their disconsolate meeting on the edge of it, when they nearly voted themselves beaten by the bog, only Stephenson would not let them.

On the 15th of September, 1830, there was to be a public opening of the road, and preparations were made at each end, and all along the way, for the grand event. The occasion awakened a deep and universal interest. It was justly regarded as a national event, to be celebrated with becoming honours. The Duke of Wellington, then Prime Minister, was present; also Sir Robert Peel and Mr. Huskisson, whose stirring words revived the drooping spirits of the directors after their defeat in parliament, and whose influence served to get their bill successfully through at last. No one, perhaps, had watched the progress of the enterprise with deeper interest than Mr. Huskisson, or rejoiced more in the vanquishing of one difficulty after another to its final finishing. Great numbers came from far and near, who, assembling by the slow mode of travel of those days, took time accordingly.



Carriages lined the roads and lanes; the river was crowded with boats; and soldiers and constables had their hands full to keep the people from the track.

The new locomotives, eight in number, having been faithfully tested, steamed proudly up. The "Northumbrian," driven by George Stephenson, took the lead. Next the "Phoenix," under Robert's charge; then the "North Star," by a brother of George. The "Rocket," and the rest, with their trains, followed. Six hundred persons were in this procession, flying at the rate of twenty-five miles an hour! Oh, the wonder and admiration which the spectacle excited! These noble steam-horses panting, prancing, snorting, puffing, blowing, shooting through tunnels, dashing across bridges, coursing high embankments, and racing over the fields and far away. England and the world never saw before a sight like that.

But the joy and the triumph of the occasion were destined to be dampened by a terrible disaster. At Parkenside, seventeen miles from Liverpool, the "Northumbrian," which carried the Duke and his party, was drawn up on one track, in order to allow the other trains to pass in review before them on the other. Mr. Huskisson alighted, and, standing outside, was talking with the Duke, when a hurried cry of "Get in! get in!" went up from the bystanders; for on came the "Rocket," steaming along at full speed. Mr. Huskisson, startled and confused, attempted to regain the carriage an instant too late; he was struck down, and the "Rocket" went over him.

"I have met my death!" exclaimed the unfortunate statesman; which, alas! proved but too true, for he died that evening.

A sad confusion prevailed. The body of the wounded gentleman was lifted into the car, or carriage as it then was, and the "Northumbrian" took him over the track home, a distance of fifteen miles, in about twenty minutes. So swiftly and easily done! The use rather than the abuse of the new power made the strongest impression.

The mournful accident threw a cloud over the occasion. The Duke wished to stop the celebration, and immediately return to Liverpool. Mr. Huskisson's friends joined with him in the wish. Others felt that Manchester should not be disappointed in witnessing the arrival of the trains, and that the accident might become magnified and misrepresented, and thus operate mischievously upon public sentiment in relation to railroads; the party therefore consented to proceed to their journey's end, but were unwilling to mingle in any of the rejoicings common to such occasions.

But the railroad needed no such demonstrations to prove its worth. It had within itself more substantial proof. Time was saved; labour was saved; money was saved. Coal, cotton, and every article of merchandise useful to men could be carried cheaper, could be had cheaper, than ever before, and, what was better, had in quantities sufficient to satisfy the industry and necessities of men. And with cheapness was combined comfort and safety. The first eighteen months seven hundred thousand persons were carried over the road, and not an accident happened.

But were not people frightened by the smoke, cinders, fire, and noise of the engines, as the opposition in Parliament declared they would be? No, no. It was not long before everybody wanted land near the track; and land, therefore, near the road rapidly rose in value. The farmers who had scouted the surveyors from their fields now complained of being left on one side; and those who had farms near the stations to rent rented them at a much higher rate than ever before. Barren lots became suddenly profitable, and even Chat Moss was turned into productive acres.

In 1692 an old writer states, "There is an admirable commodiousness both for men and women of the better rank to travel from London, the like of which has not been known in the world; and that is, by stage-coaches, wherein one may be transferred to any place, sheltered from foul weather, with a velocity and speed equal to the fastest posts in foreign countries; for the stage-coaches called 'Flying-coaches' make forty or fifty miles a day."

An English paper, bearing the date of January, 1775, has this advertisement, "HEREFORD MACHINE. In a day and a half, twice a week, continues flying from the 'Swan' in Hereford, Monday and Thursday, to London."

What would the people of those days say to a railroad carriage, especially on the "Lightning Train?"

The first stage-coach between Boston and New York began, June 24, 1772, to run once a fortnight, starting on the thirteenth, and arriving on the twenty-eighth, fifteen days' travel. Now the distance is gone over in less than the same number of hours. And so the first stage-coach between New York and Philadelphia, begun in 1756, occupied three days in the journey. Three days dwindle down to three hours in the train.

In the Scriptures we find Isaiah with prophetic eye looking over the centuries to these later times, and penning down, "Every valley shall be exalted, and every mountain and hill shall be made low: and the crooked shall be made straight, and the rough places plain;" and "swift messengers" are seen executing the world's affairs—no meagre description of the great means of intercourse in our day, the railway and telegraph. The prophet saw in it a clearing of the track for the coming kingdom of the Redeemer, which is, some time, to spread over the whole earth as "the waters cover the sea." Men make good tools and instruments for themselves. They forget they are perfecting them for God also, who is using them, and who will use them to make known the precious Gospel of His Son, "peace on earth, and good will to men."



What powerful preachers for the Sabbath are the railway and telegraph, doing away with all necessity and every excuse for Sabbath travelling, as they do. Long journeys and the most urgent business can be done between Sabbath and Sabbath, giving a rest-day to the nation. And this view of them is deserving more and more regard.

The institution of the Sabbath was founded with the human race. It was meant to be the rest-day of the entire world. It was set up as a blessing: "The Lord blessed the Sabbath-day, and hallowed it." The bodies of man and beast need it. The muscles, bones, nerves, sinews, and brain cannot endure the strain of constant and uninterrupted work. It is a day of making up the waste of the animal frame under continual labour and excitement. Night rest is not enough. The God of nature and the God of the Sabbath has fitted the one to the other.



When the knowledge of God had faded out of the earth, and God chose a people to restore and preserve it, besides a code of national laws particularly for them, He enacted from Sinai a code of moral laws for man. Among them was the rest-law of the Sabbath. It is the Fourth Commandment of the Decalogue, taught in all our Sabbath-schools, pulpits, and homes: "Remember the Sabbath-day, to keep it holy: in it thou shalt do no work," man or beast. Farther, God promises great reward to those who call "the Sabbath a delight, the holy of the Lord, honourable \* \* not doing thine own ways, nor finding thine own pleasure, nor speaking thine own words, but delighting thyself in the Lord;" showing not only the rest-use of the Sabbath, but its soul-use, as a day of special intercourse with God.

"The Sabbath was made for man," says Jesus Christ; and the *Christian* Sabbath incorporated into it the finishing of the great plan of our redemption, when Christ,

"Who endured the cross and grave,  
Sinners to redeem and save,"

left the tomb and ascended to heaven. Thus it is appropriately called "the Lord's day," the day when our worldly business is to be set aside, and Christ presses His claims upon the hearts and consciences of men. It is a break in the hurrying whirl of this life's interests, to consider the solemn issues of eternity, and that Atoning Love which is mighty to save all who, by repentance and faith, accept its terms of mercy.

We find it was on the observance or desecration of the Sabbath that the prosperity of the Hebrew nation hung. "You bring wrath upon the nation," cried Nehemiah to the Sabbath-breaking traders. "This very profanation has been the cause of our disasters in times past." For Sabbath profanation leads to forgetfulness of God; and God left out, what becomes of man? Ruin stares him in the face. "The ungodly shall not prosper." What becomes of a nation? Ruin. They shall be left to their own doings. The French nation blotted out the Sabbath, and showed what it was *to be left of God*.

When an African prince sent an ambassador to Queen Victoria with costly presents, and asked her to tell him in return the secret of England's greatness and England's glory, presenting him

with a copy of the Bible, the queen replied, "Tell your prince that *this* is the secret of England's greatness."

If this is true of England, much more must it prove true of America. For all our institutions, all our civil and religious interests, month by month and year by year, are in the hands of and are subject to the will of the people. What ought such a people to be. Pre-eminently they need the morality of the Bible, the conscience and the self-restraint which the Bible enjoins; and for this purpose they must vigorously support the institutions of the Bible. Foremost in the foreground is the Sabbath. It has come down to us through the ages, the great anniversary-day of a finished creation and a completed atonement, summoning men to call on the name of the Lord, and bless and praise His holy name.



Holy Bible

On its observance the highest moral education of the people depends. Every railroad corporation is bound to be a Sabbath-keeping corporation. It *makes time enough* to do its work. The *nature* of its work demands responsible men. An immense amount of property is in its hands, requiring officers of scrupulous integrity to manage its interests. The gross receipts of eight of the railways terminating in London are over two hundred and fifty thousand pounds a week.

It has the life and limbs of thousands upon thousands entrusted to its charge, at the mercy of its employers, engineers, firemen, brakemen, switchmen, the recklessness or unfaithfulness of any of whom can bring sudden death to scores, and plunge a nation into mourning. These men, to be *kept* the right men, need the Sabbath. To be honest, responsible, vigilant, true, God-fearing men, fit for their posts of duty, they *must have* the Sabbath.

Many roads are Sabbath-keeping. Some of those which do run on that day are poorly paid. Carrying the mail helps them out. They run, perhaps, for that purpose. But is it *necessary* to keep up Sabbath violation on our great routes in order to forward the mail? Does not the Saturday telegraph do away with that necessity? Every important item of business can be put through on the wires in time.

The side of the Sabbath is the side of God.

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What became of George Stephenson and his son Robert? the boys will have the curiosity to ask.

George and Robert Stephenson took their rank among the great men of England—that class of great men who contribute to the true prosperity of the world, by giving it better tools to do its labour with. A good tool is a great civilizer. The more perfect the instrument, the better the work. The more perfect the instrument, the greater the number of persons benefited: for the sagacity necessary to invention and discovery, and the intelligence required to mature them, are large-hearted and broad-minded. They work for the many, not the few.

The history of railways in England it is not my object to give you, and that enters largely into the remaining period of George Stephenson's life; you will find it fully detailed in Smiles' life of him. He became rich and famous, yet he always preserved the simple habits and tastes of his early days. Though asked to dine at the richly-spread tables of lords and baronets, no dish suited his taste better than his frugal oatmeal "crowdie," and no cook served it better than himself. Kings and queens thought it a privilege to talk with him. Liverpool erected a statue of him. The King of Belgium knighted him. But he cared little for honours. When somebody, wishing to dedicate a book to him, asked what his "ornamental initials" were, "I have to state," replied he, "that I have no flourishes to my name, either before or after. I think it will be as well if you merely say, 'George Stephenson.'"

Young men beginning life often called upon him for advice and assistance. He hated show and foppery, and a weakness in that direction often got reproof. One day one came flourishing a gold-headed cane. "Put by that stick, my man," said Stephenson, "and I will talk with you."

"You will, sir, I hope, excuse me," he said, on another occasion, to a gaily-dressed youth; "I am plain spoken, and am sorry to see a clever young man like you disfigured by that fine-patterned waistcoat, and all those chains and fang-dangs. If I, sir, had bothered *my head* with those things when I was of your age *I should not have been where I now am.*"

Wholesome as were his reproofs, his counsel was as reliable, and his help as timely. From the mine of his own rugged experience he had gathered truths richer than grains of gold; and he

never allowed any good opportunity to pass without insisting upon the practice of those homelier and sterner virtues which form the strong woof of character. When building a road between Birmingham and London, Robert walked twenty times over the entire route, illustrating the patient assiduity taught him by his father. No slipshod work could escape their eye. "*Neglect nothing*," was their motto. As a Killingworth collier, George put his brains and his heart into his work; as a master-builder, he put his conscience into it. All his work was honest, representing the actual character of the man.

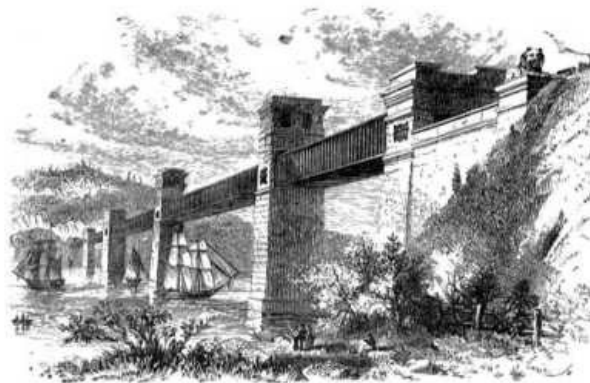
When the rough and tumble of life began to subside, and he became a more stationary engine, with greater leisure for the enjoyment of his now ample home, his old love for birds, dogs, horses, and rabbits revived. There was not a bird's nest upon his grounds that he did not know, and he often watched their building with a builder's interest; a blade of grass, a bit of bark, a nest of birds, an ant tugging for one poor grain, were all to his mind revelations of the wonderful mechanism and creative power of God.

He died in August, 1848, in the sixty-seventh year of his age.

Robert proved himself worthy of such a father. They were alike in character, intimately associated in the great engineering enterprises of their day, and bound to each other by the fondest affection.

George built roads, Robert bridges to run them over; for railroads have given birth to the most stupendous and splendid bridges the world ever saw. The famous tubular bridge over the Straits of Menai, connecting Holyhead with the main land, and the High Level bridge of Newcastle, built by him, are monuments of engineering skill. You often see pictures of them. The most remarkable work of his genius, however, is on *the American* side of the Atlantic ocean.

The Grand Trunk Railway of Canada, terminating at Montreal, wanted to connect with the seaboard; and the road was extended from Montreal to Portland, Maine. But the river St. Lawrence, deep and broad, sweeping down its mighty current the waters and ice of the great lakes, broke the line, and separated the road into two parts. The river must be spanned. A bridge must be built. It was a stupendous undertaking, but Robert Stephenson can do it. Robert Stephenson did do it. It is thrown from Languire to a point half a mile below the city, a distance of nearly two miles. It is composed of twenty-four spans, and has three million feet of solid masonry in it. The road runs through iron tubes, sixty feet above the river, and the train is nine minutes going across. There are ten thousand tons of iron in the tubes. It was six years in building. It is called the Goliath of bridges, and is named the Victoria Bridge, in honour of the Queen.



**TUBULAR BRIDGE OVER THE MENAI STRAITS.**

Robert drafted, calculated, estimated, and superintended section after section of this immense work, and yet never visited the scene of labour; photographs were sent him of its progress step by step. It was finished December, 1859, and opened with all the festal honours possible in that season of the year. At the entertainments given there was one sentiment: "Robert Stephenson, the greatest engineer the world ever saw," followed by no cheers. A deep hush swept over the assembly.

For Robert Stephenson was dead. He died the twelfth of October, two months before the full completion of the work, in the rich prime of a noble manhood. His death was looked upon as a public calamity, and England, with a true sense of his worth, laid him side by side with her most honourable dead. He was buried in Westminster Abbey, with her kings and queens, her princes and poets, her warriors and statesmen. The funeral procession was between two and three miles long; thousands lined the streets, and thousands pressed into the Abbey. Tickets were necessary in order to get entrance; and one of the most pressing applicants was a humble working-man, who, years before, drove the first locomotive engine from Birmingham to London, with Robert Stephenson at his elbow.

The humble Newcastle collier-boy crowned his life with honourable toil, and at his death a nation

mourned a great man fallen.

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You have read this short history with great interest, I doubt not, my young friends; and some I hear say, "I wish *I* could achieve some great and useful work in the world, and have my name written in a book."

It is not a mean aspiration. Every noble spirit desires to be better and greater than it is, and God gives to each of you a great and precious work to do.

You have a Saviour to serve and glorify, and heaven to win, which is indeed our great life-work here.

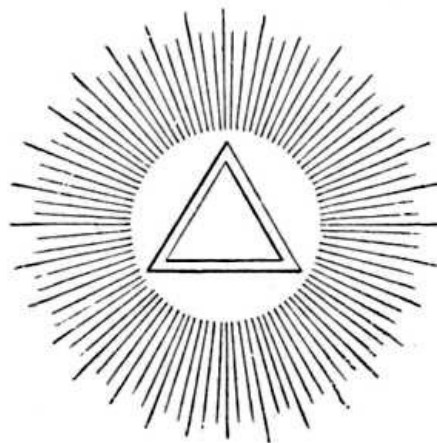
The Lord Jesus, having bought our redemption by His own blood on the cross, has set up His kingdom in the world, and says to you and to every one, "Son, give Me thy heart."

And there is but one true purpose to make before every other purpose in life: "As for me, *I* will serve the Lord." If by true repentance and faith in the Lord Jesus Christ you give yourself to Him, the noblest life is before you. This work will bless all other work. This path will make all other paths safe. No matter what your situation in this world may be, high or low, rich or poor, your Master is most honoured by godliness and humility, and they are out of place nowhere.

The world is so poor that it can give its honours to but a few. God, in His infinite richness, offers heaven to us all; and by the gift of His Holy Spirit, for which we must ever pray, a life of piety is within the reach even of a little child.

The steady trust and singleness of purpose which have so delighted you in the lives of the Stephensons, may you have, my children, in the service of your blessed Lord, who will make you victorious over every hindrance, and bring you safe to His sweet presence in heaven at last.

There you will find your name written in the Lamb's *Book of Life*, never, never to perish.



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**George Watson and Co., Printers, 28, Charles Street, Farringdon Road, London.**

**Transcriber's Note:**

Archaic and inconsistent spelling and punctuation retained.

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