

fles and little mills, and erecting clay engines, the latter being remarkably good models of the one at which his father was fireman. He was next advanced to the position of "plover" at the colliery, where, along with his elder brother, he cleared coal of stones and dross, and drew sixpence a day. Then he was given the work of driving the gin-horse at Black Callerton colliery, two miles from Dewley Burn, at eight-pence a day. At this time he is described as a "grit barlegged laddie, very quick-witted, and full of fun and tricks." Often when off duty he went bird-nesting, having inherited from his father a strong attachment for birds and animals. He tamed young black-birds, taught them to fly about the cottage unconfined by cages, and prided himself upon the superiority of his breed of rabbits. But this was only a pastime. He still applied himself to the intricacies of mechanical contrivances as far as his limited opportunities would permit.

At the age of fourteen he became assistant fireman to his father at Dewley. His ambition was to be an engineman, and his exultation was unbounded when, a year later, he attained the desired promotion, and was in one of the workings of Jolley's Close mine on his own account. He was now a steady, sober, hard-working young man. His time and means were never spent in the ale-house, where so many of his companions made it a practice to go. He was working to be a man, and his heroic perseverance was making the necessary preparation. He possessed a powerful physique, and held his position well in all feats of strength with his companions.

At the age of seventeen George was appointed plugman of a pumping engine, and was thus ahead of his father, who worked it as fireman. In this responsible position he devoted himself assiduously to the study of the engine, frequently taking it to pieces in his own time, for the purpose of cleaning and mastering its parts, and thus acquired a thorough practical knowledge of its construction. An engine seemed to attract him by some mysterious fascination; it was no dull, groaning machine in his estimation, but a thing instinct with wondrous life. Its complicated mechanism absorbed his interest, and excited his admiration. The minute study of its details, while quickening his powers of observation, made him an accomplished workman, and gained for him the increased confidence of his employers. At this period he worked twelve hours every day, and earned twelve shillings (three dollars) a week.

He now found himself face to face with a fresh difficulty. He knew all about the different parts of the engine under his charge, and had heard of the engines of Watts and Bolton. In a knowledge of these was a broader field for him, but he could not read a word. He was eighteen years of age, and did not know his letters. Many of his companions were in the same condition, and seemed content to remain there. But not so with George Stephenson. There was spirit in him, and the understanding that came to him from the Almighty, whose grace and favor he sought,

taught him the necessity of adding to his qualifications a knowledge of the elements of a school training. His time was limited, but his energy was equal to the emergency. His mind had been trained to grasp at ideas, and to retain knowledge. He went to a night school, where the big bonny, strong-muscled engineman pored over his letters and wielded the delicate pen in making "straight strokes and pot-hooks." He was not abashed by having to confess his ignorance; he was proud that he possessed the capability of learning. Soon he mastered his subjects sufficient to get along and turned to a new teacher, Andrew Robertson, a Scotch dominie who enjoyed the reputation of being a skilled mathematician. He improved every spare minute in working out the sums set for him by the learned dominie of Newburn, till the student outstripped his teacher.

What a memorable model to young men! Against every disadvantage of circumstance and fortune he struggled onwards, by sheer force of will and the determination to succeed. Many men, unschooled like him in boyhood, and of equal natural ability, ashamed to confess their ignorance, would have remained without instruction, and would never have risen out of the rut in which the fortune of lowly birth had thrown them. But it was different with George Stephenson. He taught that to intelligent perseverance all things are possible, and proved that where the desire to learn is strong rapid attainment is certain. What a notable example he is in this regard to the youth of Utah! There may or may not be within their reach the means of revolutionizing a prevalent system; but there is in their power, by industry, energy, intelligence and perseverance, the way of making life a success and of leaving to future generations an enduring example of worthy manhood.

George Stephenson went on and on—slowly, but still onward. His development of his mechanical genius made him a "handy man." He could sole the shoes of his sweetheart, Fanny Henderson, and receive the compliment that he had made "a capital job of it." It was from shoemaking that he managed to save his first guinea. Soon after he completed his studies with Dominie Robertson he married, and the benign influence of a sweet and gentle woman came to light his life; for, although she died three years afterward, leaving him with a baby boy, her memory was fondly cherished and lightened his heart with hope in many a darkened hour.

From Black Callerton, Stephenson went to Willington Quay. There he continued his regular course of life, working hard during the day, and doing odd jobs and studying the principles of mechanics in the evenings. He also modeled experimental engines, and occupied himself much in endeavoring to discover perpetual motion. He finally concluded that the latter was not possible, and left it for more attainable objects. He allowed few minutes to pass unimproved; his eye was ever observant, and his mind ever active. He could make and mend shoes, cut out shoe lasts, clean clocks, and model complicated machines. At Willington his only son Robert was born, and two years later, in 1804, he

moved to Killingworth, seven miles north of Newcastle.

After the death of his wife at Killingworth he went to Montrose, Scotland, where he worked for a year. In 1807-8 he contemplated the idea of removing to the United States, but could not raise the money required to emigrate. Stinted as he was for means, he resolved to send his son Robert to school. Of this he said, in a speech at Newcastle long afterwards, "When Robert was a little boy, I saw how deficient I was in education, and I made up my mind that he should not labor under the same defect, but that I would put him to school and give him a liberal training. I was, however, a poor man; and how do you think I managed? I betook myself to mending my neighbors' clocks and watches at night, after my daily labor was done, and thus I procured the means of educating my son."

An achievement which George performed at this time drew toward him additional attention. At the Killingworth pit the engine-repairers had failed to fix an atmospheric engine in use so that water could be pumped out of the shaft, and the workmen were often "drowned out." Stephenson took the engine apart and made the necessary repairs. In recognition of his skill he received a present of £10. He was beginning to receive a reward for his perseverance, and this incited him to greater diligence, if that was possible. He made many ingenious mechanical contrivances; invented a "fley craw" to protect garden crops from the ravages of birds; connected cradles with the smoke-jack for the women, and made them self-acting; contrived a lamp which burned under water; and made many other devices.

In 1812 Hedley's locomotive was made at Wylam, and Stephenson became interested in it. Several other makers tried their ingenuity, and he finally concluded that he could surpass them all. All of the locomotives made cost more than horse power for operation. Stephenson was authorized by Lord Ravensworth, a lessee of the Killingworth colliery, to build one, and it was tested on the Killingworth railroad July 25th, 1814. It succeeded in drawing after it, on an ascending gradient of 1 in 450, eight loaded cars, of thirty tons' weight, at four miles an hour. It was a slow, cumbersome machine, but was an advance upon all previous locomotives, and cost no more to work than horse power. Stephenson saw its defect, and to cure it invented and applied the steam-blast, which more than doubled the engine's power. Then he constructed a second locomotive which was a complete success. It was finished in 1815, and may be regarded as the type of the present locomotive. It is the "Stephenson No. 1 Engine," which rests on the crest of the High Level Bridge.

An incident is related of Stephenson at this time, showing his courage and presence of mind. "One day a workman hurried into his cottage, with the startling information that the deepest mine in the colliery was on fire! He immediately hastened to the pit-mouth, about a hundred yards off, whither the women and children of the colliery were fast running, with wildness and terror depicted in every face. In an energetic