

From the British Annual.

## JAMES WATT.

The celebrity of some men may be compared to a meteor, which appears for a time and then vanishes away; their memory is only found in their marble monuments. Others again, like planets, have succeeded in attaining to a more permanent distinction; they have conferred benefits upon their fellow-men, which remain after them; they require no busts, no empty gorgeous structures, to tell that they have lived; their memory is in their works. Of this latter class was James Watt, the immortal discoverer of the steam-engine. He was born in 1736, at Greenock, in Scotland, where his father was a merchant and a magistrate. His grandfather and uncle both distinguished themselves as mathematicians and engineers. The subject of our memoir was educated in his native town, which has long been distinguished as a port of extensive commercial relations, and for the elegance and substantiality of the works of its mechanics, especially in reference to navigation. Till the age of sixteen he continued at the grammar school; at eighteen he was sent to London, being bound to a distinguished mathematical instrument maker. Here, however, the delicacy of his health, from an attack of rheumatism, occasioned by working one winter's day in the open air, prevented him from deriving any advantage from his situation, and he was soon obliged to return to his native country. In 1757, he went to reside in the University of Glasgow, being appointed philosophical instrument maker to that seminary, with apartments in the building. In this situation he remained till 1764, when he married his cousin, Miss Miller. He then established himself in the town as an engineer. While in this capacity, he was consulted with regard to the great canal, which traverses Scotland from east to west, termed the Caledonian Canal; and he is said to have projected the canal which unites the Clyde and Forth. An accidental circumstance, however, had given a different bent to his pursuits. One of Newcomen's steam engines had been sent to him from the Natural Philosophy class, for the purpose of being repaired, and this turned his attention to the power of steam, of which he was destined to make such splendid application. He remarked, that two-thirds of the steam were condensed by the contact with cold water; hence there was a loss of two-thirds of the fuel. He first attempted to substitute a wooden pipe for a tube of iron, considering that the wood is a worse conductor of heat; but he found that the wood had less resistance to the sudden alternations of temperature. He then thought of passing the steam into an iron tube without cooling the walls of the tube; this constituted the invention of the condenser. This vessel, free from air, and communicating with the water, being opened at the moment when the tube is filled with steam, draws the latter towards it, and when the vessel receives at the same time a jet of cold water, the steam which is passing to fill it is condensed; the remaining part of the steam in the pipe is removed into the vacuum caused by condensation, and thus the piston is allowed free play. To get rid of the water in the condenser, a small air-pump was applied, which was worked by the piston. The invention of the condenser was, then, Watt's first great improvement. The second was the admission of steam above and below the piston, according as it was to be depressed or raised. He surrounded the metal tubes with wood, in order to keep in the heat. He calculated with precision the quantity of fuel necessary for producing a certain portion of steam, and the volume of cold water required to condense it. Such were the inventions for which a new patent was obtained, but funds were wanted to extend the utility of the discovery. Fortunately, a purchaser for the interest in the patent was met with in the person of Matthew Bolton, of Birmingham. To him, therefore, it may with justice be said, that the country owes the present diffusion and importance of the steam-engine. The firm of Watt and Bolton commenced their manufactory, at Birmingham, by constructing a steam-engine, which all those interested in mining were requested to inspect. The invention began gradually to be appreciated, especially in Cornwall; and Watt's engine very soon replaced that of Newcomen. One great encouragement to adopt the new engine was the terms upon which it was supplied. The agreement was, that one third of the saving of fuel over the old engine should be the price of the new engine.

The saving was carefully ascertained in this way:—the quantity of fuel necessary for producing a certain number of strokes of the piston was ascertained by Newcomen's engine, and by a new one of the same dimensions; the number of strokes was determined by means of a piece of clock-work termed the counter, attached to the engine, and so arranged that every stroke advanced the hand one division. The instrument was placed in a box supplied with two keys, and was opened at the time for settling accounts in presence of the agent of Watt and Bolton, and of the director of the mine. To show the amount of saving, it is only necessary to state, that the sum which the firm derived from three engines in one year at the Chacewater mine, in Cornwall, amounted to £2382, proving that the saving of fuel by the new plan was equal to upwards of £7000 per annum, being equivalent to £2382 per annum on each engine.

The manufactory of Soho speedily extended its limits, and

what was once a sterile hill, soon became a populous and fertile manufactory. The firm obtained an extension of their patent to 1800. To this period the engine had only been employed to raise water, but in 1800 Watt began to think of applying it to mills. This he conceived might be effected on the principle of the spinning wheel, where the impulse which turns it one half completes the revolution. While engaged with his model, he learned that a manufacturer of Birmingham, named Rickards, had constructed what he was in search of. He procured a plan of it, and found that his own plan had been sold by one of his faithless workmen to Rickards, who had procured a patent. It was too late to claim the invention, and he therefore sought for a new plan. He accordingly invented what is termed the sun and planet motion.

The intelligent and aspiring mind of Watt, however, was not content with directing its attention to one subject alone; he invented, in 1779, a copying-press, consisting of two cylinders, between which a sheet of moistened paper was passed, and applied over a printed sheet; this contrivance was very successful. In March, 1787, he introduced into Great Britain the method of bleaching cotton by means of chlorine, which had been discovered in France by Berthollet. This claim was at one time disputed in favour of Professor Copland, of Aberdeen; but it was quickly set at rest on the side of Mr. Watt. In 1800, Mr. Watt retired from the firm with a handsome fortune, and was succeeded by his son, who continued, along with a son of Mr. Bolton, to carry on the manufactory. During his residence in Glasgow, his first wife died. At Birmingham he married the daughter of Mr. Macgregor, a manufacturer of Scotland, with whom in the heart of his family he happily spent the evening of his days. While engaged in business he was much troubled with head-ache, which, however ceased to affect him when he was relieved from his labours. He was elected a Fellow of the Royal Societies of London and Edinburgh; and the Institute of Paris, in 1808, made him one of their eight foreign associates. In 1817, he visited Scotland for the last time. In the course of two years afterwards his health broke down, and he died on the 25th of August, 1819, aged eighty-four years, beloved and lamented by all. Mr. Watt was one of the most extraordinary men of any age. He was not only a mechanic, he was an accomplished scholar, and yet in a great measure self-taught. He was familiar with the modern languages, and had an excellent acquaintance with chemistry, physics, antiquities, architecture, music; in short, he was generally well-informed. Possessing all these requisites, and a splendid benefactor of his country, it is remarkable that government never conferred any honour upon him. But the days of Watt will endure for ever.

A handsome statue of Watt was erected in 1824, at Birmingham. Glasgow possesses a similar tribute to his memory, and Westminster Abbey can now boast of having deposited within its walls a marble statue of one who has conferred greater benefits on his country and on the world, than perhaps any individual commemorated by its gorgeous monuments. Where is the name of Watt unknown?

## CZAR PETER THE FIRST.

Czar Peter the first, merited the title of Great, not only for his extraordinary political and military abilities, always displayed for the real happiness of his subjects; but for many incidents in his private character, and one of which should set him above Sesostris and Alexander. He saw at the house of one of his nobility a beautiful servant-maid, and there heard an excellent character of her virtue and understanding. Taking her into his own service, he soon perceived that her beauty, brilliant as it was above that of other women, was lost in the superior lustre of her wit and understanding. I will not say he condescended, but rather, that he soared above other kings, when he married, and raised to his throne this daughter of a peasant, this glory of her sex, and never had reason to repent the deed. His raising Menzicof from the condition of a ballad-singer and a poor basket-boy, as high as the wealth and honours of the empire could carry him, is a similar proof of goodness and greatness in the soul of this extraordinary man. Menzicof was the orphan of a broken gentleman, and had no better way of supporting himself than that of singing ballads, and selling fruit about the streets, in which occupation the Czar happened one day to see him as he was going to a grand dinner with one of his Russian lords. In the kitchen of this very lord, young Menzicof served as a scullion, and got his dinner every day, but was allowed, at vacant hours, to make out the remainder of his subsistence by his double employment in the streets. The Czar having been struck with somewhat of dignity in the pretty boy's appearance, and seeing him at the door when he stopped, desired he might attend that day at table. Among the many dishes provided for so splendid an entertainment, there was one seasoned up to the Czar's particular liking, placed just before his chair, and strongly recommended by the master of the house. Just as the Emperor was going to help himself to a plate of this dish, Menzicof forbade him to touch it. Being asked why, he frankly and boldly declared, that as he was serving in the kitchen, he saw the lord of the house throw somewhat secretly into the mess, while it stood on the fire, and the cook's face was turned away. The Czar,

observing some confusion in the countenance of his entertainer, ordered a dog to be brought in, and fed on a plate of stuff taken from the dish in question, which almost instantly threw the poor animal into convulsions, and killed him. A worse animal in the room quickly lost his head, and that of Menzicof was so exalted, as to sit next his sovereign and to be heard of all the world over. The atheist, after saying the world was made and is governed by chance, may say, too, that this father of the Russian empire was saved by chance, because God did not ocularly appear in the transaction. But the man who sees, through his reason, an organ which penetrates deeper and farther than his eye, will trace God from the death of Menzicof's father, through all the streets, and into the kitchen, and into the parlour of the wicked lord; and will see him there, through the genius of Peter, conducting one of the most extensive empires of the world from absolute barbarism into a happy state of culture and civilisation. Is a rational creature to believe nothing but upon the immediate testimony of his senses? Did he see the Almighty actually employed in the work of creation? Or can he see the invisible in that of Providence? Did he see him in the ascent of the ten thousand Greeks? Did he see him in the expulsion of the English out of France by a poor country girl? Or did he see him working out the eternal salvation of mankind on the Cross of Christ, even by the malice of the devil and his instruments? If the world was worth his making, why is it not worth his superintendence?—Skellon.

## BOOKS.

"Twere well with most, if books, that could engage  
Their childhood, pleased them at a riper age;  
The man approving what had charmed the boy,  
Would die at last in comfort, peace, and joy;  
And not with curses on his art, who stole  
The gem of truth from his unguarded soul."

If there be one word in our language, beyond all others, teeming with delightful associations, "books" is that word. At that magic name what vivid retrospections of bygone times, what summer days of unalloyed happiness, "when life was new," rush on the memory! even now the spell retains its power to charm: the beloved of my youth is the solace of my declining years: such is the enduring nature of an early attachment to literature.

The first book that inspired me with a taste for reading, was "Bunyan's Pilgrim's Progress;" never shall I forget the intense emotion with which I perused this pious and interesting fiction; the picturesque descriptions and quaint moralities blended with this fine allegory, heightened the enchantment, and which, to a youthful and fervid imagination, "unsated yet with garbage," was complete. From henceforward my bias was determined; the passion grew with my growth, and strengthened with my strength; and I devoured all the books that fell in my way, as if "appetite increased by what it fed on." My next step was, I commenced collector. Smile, if you will, reader, but admire the benevolence of creative wisdom, by which the means of happiness are so nicely adjusted to the capacity for enjoyment: for, slender as in those days were my finances, I much doubt if the noble possessor of the unique edition of Boccaccio, marched off with his envied prize, at the cost of two thousand five hundred pounds, more triumphantly than I did with my sixpenny pamphlet, or dog's eared volume, destined to form the nucleus of my future library.

The moral advantages arising out of a love of books are so obvious, that to enlarge upon such a topic might be deemed a gratuitous parade of truisms; I shall therefore proceed to offer a few observations as to the modes of deriving both pleasure and improvement from the cultivation of this most fascinating and intellectual of all pursuits. Lord Bacon says, with his usual discrimination, "some books are to be tasted, others to be swallowed, and some few to be chewed and digested;" this short sentence comprises the whole practical wisdom of the subject, and in like manner, by an extension of the principle, the choice of a library must be regulated. "Few books, well selected, are best," is a maxim useful to all, but more especially to young collectors: for let it be remembered, that economy in our pleasures invariably tends to enlarge the sphere of our enjoyments. Fuller remarks, "that it is a vanity to persuade the world one hath much learning by getting a great library;" and the supposition is equally erroneous, that a large collection necessarily implies a good one. The truth is, were we to discard all the works of a mere temporary interest, and of solemn trifling, that encumber the fields of literature, the magnitude of numerous vast libraries would suddenly shrink into most diminutive dimensions, for the number of good original authors is comparatively few; study therefore quality rather than quantity in the selection of your books. As regards the luxuries of the library, keep a rigid watch upon your inclinations; for though it must not be denied that there is a rational pleasure in seeing a favourite author elegantly attired, nothing is more ridiculous than this taste pushed to the extreme; for then this refined pursuit degenerates into a mere hobby horse, and once fairly mounted, good bye to prudence and common sense! The Bibliomaniac is thus pleasantly satirised by an old poet in the "Shyp of Fools."