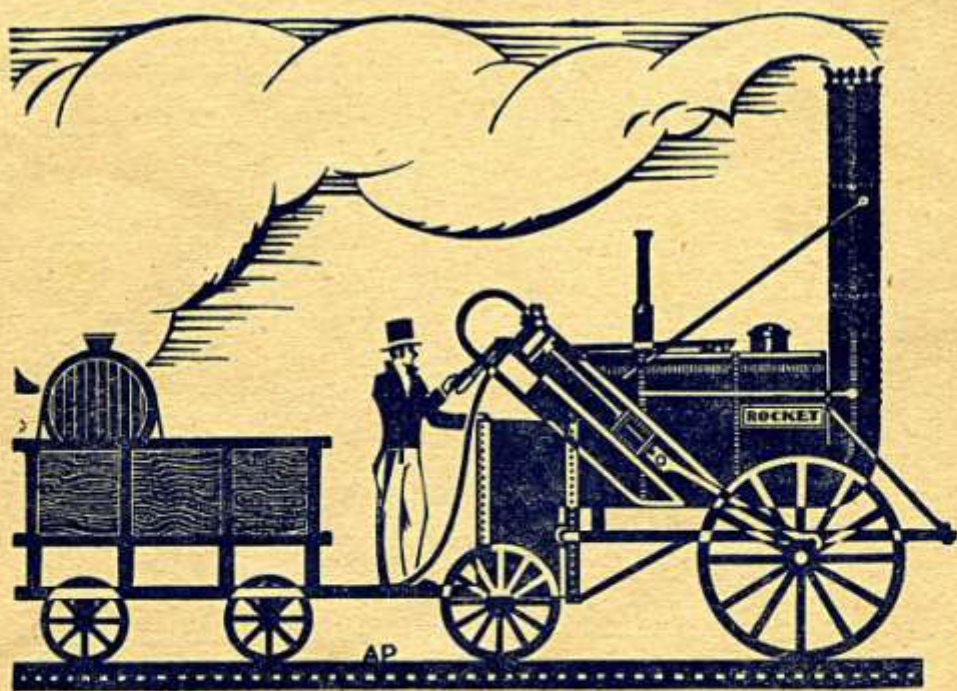




BOROUGH OF CHESTERFIELD

*George Stephenson  
Centenary Commemoration*

*August 12th to 28th, 1948*

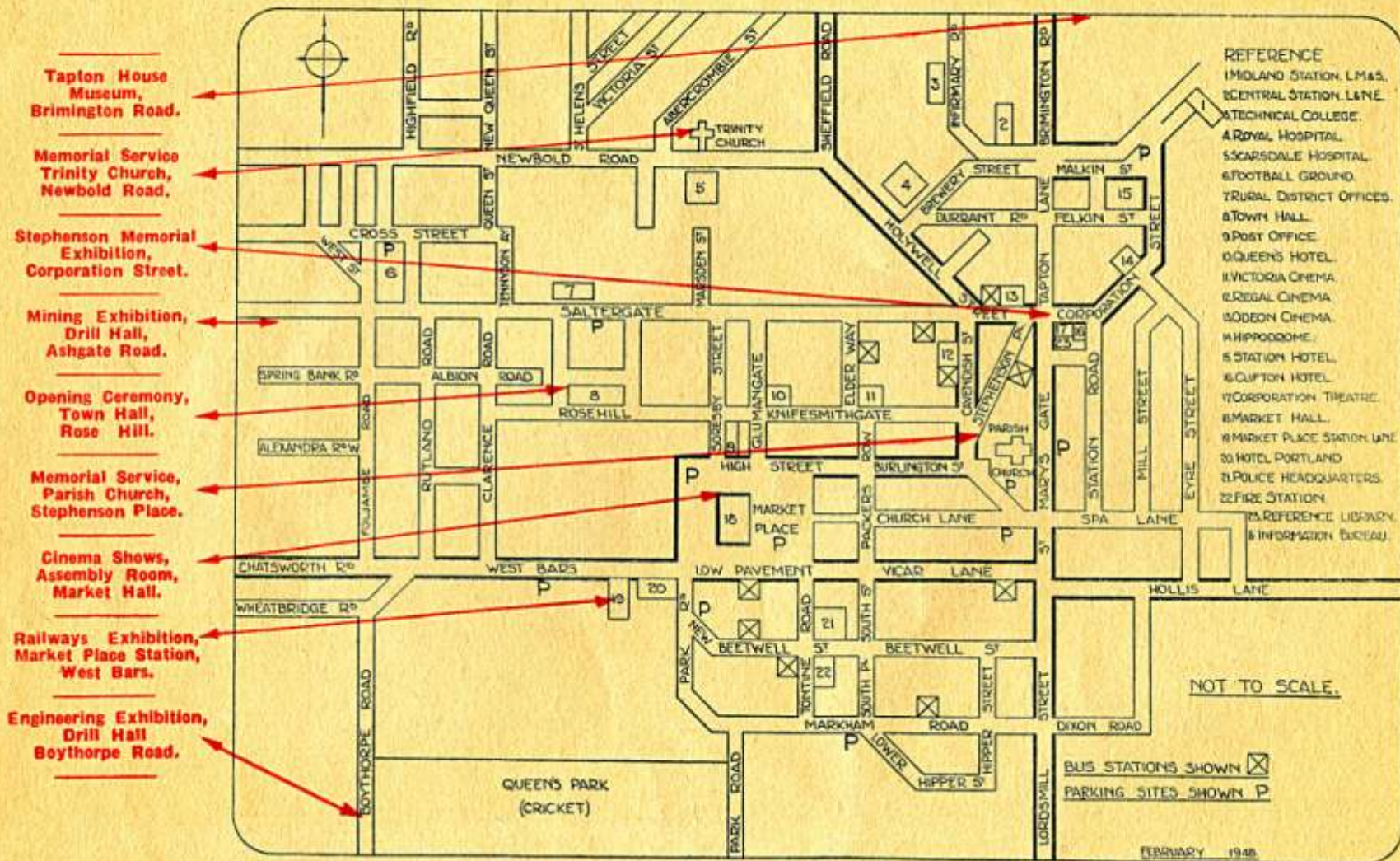


*Two Shillings*



# Borough of Chesterfield George Stephenson Centenary Commemoration—August 12 to 28, 1948

## GUIDE TO VISITORS







**GEORGE STEPHENSON.**

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The Stephenson Centenary Committee express their grateful thanks to all who have contributed to the publication of this brochure.

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GEORGE STEPHENSON MEMORIAL FUND COMMITTEE.

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## *A Short Biography of George Stephenson*

By Principal W. R. Parsonage, B.Sc., M.I.Mech.E.

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Institution of Mechanical Engineers.

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**G**EORGE STEPHENSON was born on 9th June, 1781, the second child in a mine labourer's family which ultimately numbered six children. The place of his birth was Wylam-on-Tyne, a mining village about eight miles from Newcastle. The house usually shown as Stephenson's birthplace (Fig. 4, page 48) was divided into four labourers' dwellings; the lower room only in the west end of the house was the home of the Stephenson family. When the family was growing up and George was about seventeen years of age, they lived in a district called Jolly's Close near the village of Newburn where the Duke of Northumberland had recently sunk a new pit. This home was a poor cottage of one room only in which the father, mother, four sons, and two daughters all lived and slept. The one room crowded with three old poled beds, served as parlour, kitchen, and sleeping room for all of them.

At noon on the 12th August, 1848, in his sixty-eighth year he died a wealthy man at Tapton House, a large mansion in Chesterfield, though he had never been a lover of wealth as such, and with opportunities to amass a colossal fortune, had



preferred honour to gold. He was buried in a vault in the small chancel of Holy Trinity Church, Chesterfield, then a new church in which he used to worship. "G.S 1848" on a rough floor slab of Derbyshire stone marks his resting place (Fig. 2, page 47) and on the south wall of the chancel is a simple tablet (Fig. 3, page 47). Above the vault is a stained glass window erected to his memory by his son, Robert. His remains were followed to the grave by a large number of his employees, members of the Peerage, and distinguished gentlemen from all parts of his own country and from abroad. The inhabitants of Chesterfield showed their respect by suspending all business and paying solemn tribute to his memory at the funeral rites, in company with the Mayor, Aldermen, Councillors, and chief citizens.

George Stephenson was born a poor pit lad, and died a man of world renown, the adviser, associate, and friend of kings and noblemen, the most prominent, able, and influential engineer in the world, the face of which he had changed by his work. Assisted later in life by his son, Robert, he not only built successful locomotives; he tunnelled the earth, bridged rivers, and filled up swamps to make railways with travelling engines, of which he was the first to see the economic possibilities. Before any public railway had been built, whilst still a colliery enginewright who could hardly read he made remarkably accurate prophecies. He said he would make it possible for a man to breakfast in Edinburgh and have supper in London, then a journey of many days duration by stage coaches. To effect his purpose he had to design plant and organize labour on a scale never before attempted, and he took the most prominent part in organizing the biggest combinations of capital and labour the world had yet known. His railway work took him to Russia, Austria, Spain, and Belgium, where in each case he was personally consulted by the Sovereign. He was knighted in Belgium in 1837 and in Austria he was a most honoured guest. He refused an English knighthood, preferring, as he said, to remain without flourishes before or after his name.

As a mere babe he went to work to herd cows. A neighbour, widow Ainslie, wanted a boy to guard her cows and keep them from being run over by the coal wagons. "Geordie Steve" was a very proud boy when she chose him for the work at a wage of twopence a day. Later he became a farm labourer at a wage of fourpence a day and led horses at plough when hardly big enough to stride across the furrows. At an early age his greatest ambition was to be employed at the pit where his father worked; this was satisfied at about the age of twelve. He became a "weller" or picker of "bats and brasses" out of good coal at a wage of sixpence a day. Next he was an assistant fireman and later became a fireman, and in 1801, at the age of twenty, he was appointed brakesman at the Dolly Pit, Black Callerton, his wages being about one pound a week. He was now paying his addresses to a servant girl named Fanny Henderson. He had no education whatever other than the deductions of his active brain from nature. All living things, animals and plants, were the objects of his study. At eighteen years of age when totally unable to read or write, he was conducting experiments on the artificial incubation of



eggs. At nineteen, as a result of attending night school, he could just manage to sign his own name, and two years later, when he took Fanny Henderson to the altar on 28th November, 1802, he signed both names in the register but so clumsily as to make a large blot.

His next promotion was to take charge of an engine at Willington Ballast Hill. He lived in a small cottage at Willington Quay about six miles from Newcastle. Here on 16th October, 1803, was born his only son, Robert, also destined to become famous and to have his memory honoured by burial in Westminster Abbey. In 1806 his wife died of consumption after giving birth to a daughter who only lived a few months. He married his second wife, Elizabeth Hindmarsh, in 1820, she predeceased him by two years and is the wife buried with him in Trinity Church, Chesterfield. He married his third wife, Ellen Gregory, a few months before his death; she, for some time, had been his housekeeper and was a Derbyshire lady, the daughter of a Bakewell farmer and sister of a doctor in Youlgreave.

Stephenson effected several successful repairs and improvements to engines at Killingworth and improved also many of the crude appliances used in and about the pits. His skill as a mechanic attracted attention, and at the age of 31 he was appointed colliery enginewright at a wage of £100 a year. Stephenson was now a prosperous and thriving working man, but he was still almost illiterate and was taking his slate nightly at the home of a young friend who had received a comparatively good education. A copy of Ferguson's "Lectures on Mechanics" was obtained; together they studied it, Stephenson making the apparatus to perform the experiments described in it. For many years Stephenson had been chasing that will-o'-the-wisp, perpetual motion. He now saw the futility of his labours and bitterly deplored the time he had wasted, saying he would not have done so if he had had the good fortune to have access to books and had been able to read them. In 1815, Robert, his son, when 12 years of age, went back and fore to school in Newcastle on a donkey, and in a suit cut out by his father. The father made the son's education instrumental to his own, both were students together and both taught each other.

Due to the loss of life in many pit explosions, the Society in Sunderland for Preventing Accidents in Coal Mines was formed in 1813 to investigate their causes and possible means of prevention. Sir Humphrey Davey was requested to give the matter his attention and invented the safety lamp. George Stephenson was already actively in the field and invented another safety lamp. He prevented the escape of burning gas from his lamp by cooling and extinguishing the flame through small-bore tubes, later small orifices. Stephenson had a hopelessly incorrect theory of the action of his lamp but the lamp worked. Actually his lamp employed a variation of the same principle as Sir Humphrey Davey's, at which he had arrived not by scientific knowledge but by experiment and his unfathomable intuition. In conducting experiments with his lamp under dangerous conditions,



Stephenson showed himself to be a man of great personal courage and of strong confidence in his own deductions.

A premium of £2,000 had been offered by the Government to any inventor of a safety lamp. A heated controversy arose over the claims to priority asserted by both Davy and Stephenson and their respective friends. It was finally decided to award £2,000 to Davy, and £100 to Stephenson "in consideration of what he had done in the same direction." This was unsatisfactory to Stephenson and his friends. An influential committee took evidence in Newcastle and established to their complete satisfaction Stephenson's priority of claim. A fund for him was raised by subscription. He was given £1,000, a silver tankard engraved to record his invention, and a silver watch purchased solely by small subscriptions from fellow workmen and colliers.

In 1831 Dr. Paris, in his "Life of Sir Humphrey Davy," wrote: "It will hereafter be scarcely believed that an invention so eminently scientific and which could never have been derived but from the sterling treasures of science should have been claimed on behalf of an enginewright of the name of Stephenson, a person not even possessing a knowledge of the elements of chemistry." Davy thoroughly understood the action of his lamp and gave that knowledge to the world in a paper before the Royal Society, thereby laying the foundation for further improvements. It cannot, therefore, now be held that the Government premium was wrongly awarded, although Stephenson's lamp was produced first. But Stephenson might have been given more recognition and treated more generously in accordance with the facts.

In 1821, Edward Pease and his associates, all Quakers of some substance, obtained a Parliamentary Bill to construct a railway between Stockton and Darlington for the haulage of coal and merchandise. Nothing was said about locomotives; the railway was intended to be worked by horses. Stephenson heard of this and decided to take action. Late in 1821 two uninvited strangers knocked at the door of Pease's house in Darlington; they were George Stephenson and his friend and mouthpiece, Nicholas Wood, an able engineer of some learning. Stephenson introduced himself as "the enginewright at Killingworth" and invited Pease to come over to Killingworth to see what his engine could do. Pease was much impressed by Stephenson, and eventually an amended Act was obtained in 1823 to cover the use of locomotives and alterations in the line suggested by Stephenson, who was appointed Engineer at a salary of £300 a year. He was now 42. Stephenson ultimately became a far more important and wealthy man than Pease, who was a pall bearer at his funeral. One of Pease's most cherished possessions was a gold watch given to him by Stephenson as a mark of his gratitude and esteem.

Three locomotives were made by Stephenson in the locomotive works (mentioned later) which he and a few friends, including Pease, had started in Newcastle. The line was opened to goods traffic on 27th September, 1825; Stephenson drove the first locomotive in the opening procession. This engine was only intended to



go at the rate of 4 to 6 m.p.h. A man on horseback with a red flag preceded it. Stephenson, putting on steam and gathering speed, motioned the mounted flag man out of his way, and then, with his loaded train, attained a speed of about 10 m.p.h. This line was not worked for passenger traffic; a few experiments only were made in this direction. Fig. 6, page 48, is a photograph of George Stephenson's letter to Joseph Swanwick inviting him to the opening ceremony. The signature only is in George Stephenson's writing. The flourish under his signature is unusual in George Stephenson's letters although a common adornment at the time. No other signature of George Stephenson in Alderman Swanwick's possession shows any attempt at flourishes.

Stephenson clearly saw that the further success of the locomotive depended upon improved workmanship. His Killingworth engines had been built by colliery blacksmiths in colliery workshops, and he limited his designs to the practical possibilities of manufacture. The blacksmiths were good mechanics and the success of the results of their labours with their limited appliances was highly creditable, but a different type of mechanic and better appliances were needed. In 1821 George Stephenson entered into partnership with John and Isaac Burrell, Ironfounders, of Newcastle, but there is no evidence that locomotives were built by him when with this firm. On 23rd June, 1823, the firm of Robert Stephenson and Company was founded for carrying on the business of engine builders, millwrights, etc., at Newcastle. The names of the original shareholders and the amounts of their capitals were:—

Robert Stephenson ... ..	£800	(£500 was borrowed from Edward Pease).
George Stephenson ... ..	£800	
Edward Pease ... ..	£1,600	
Michael Longridge ... ..	£800	

The most notable fact is that the company should have taken the name of Robert Stephenson, the youngest of the four partners, then only in his twentieth year, who had still to prove his worth. After many vicissitudes the old works at Newcastle were closed down and new works laid out at Darlington about the year 1900. It has often been wrongly stated that the locomotive building firm was first known as George Stephenson and Son, On 12th December 1824, the firm of George Stephenson and Son, Railway Engineers, was formed at Newcastle. An office was taken in Newcastle and surveyors and draughtsmen only were employed. The original shareholders of this, a distinct and separate firm for railway building, were the same persons as those of the engine building company. The capital George Stephenson put into these businesses was drawn from his savings and from the £1,000 derived from the safety lamp subscriptions.

The next railway project was the Manchester and Liverpool line passing over the celebrated swamp, Chat Moss. Stephenson was engineer to the company and appeared before a committee of the House of Commons in support of the Bill. Clear though the subject was to him, and familiar as he was through actual experi-



ence with the possibilities of the locomotive, he could not convey his meaning to others. He was opposed by able members of the Bar and some of the foremost engineers of the country. Standing to be cross-examined he was gazed at as a curiosity, and merriment was made over his honest simplicity and Northumberland Doric, which he retained with little modification to the end of his life. During his evidence he was tripped up on the surveying. He had been badly served by his surveyors, partly through the difficulties encountered in making the survey deliberately created by landowners and others who objected to the proximity of the railway. Yet Stephenson got home with a few shrewd remarks before the Committee, including his famous reply to the question whether it would not be awkward if a cow were to stray upon the line. This "coo" chased him throughout his life and was often used in derision of him as a quack of low birth. Certain clauses of the Bill were lost and the promoters withdrew it.

The failure of the Bill was a very heavy blow to Stephenson, particularly as many of his supporters and friends lost faith in him. Edward Pease saw the shattering of his early high hopes of Stephenson. The directors of the proposed line superseded him by another engineer, a better talker. The Bill was presented again and passed. Now came the appointment of a principal engineer to carry out the project. The directors had acted in ignorance of many conditions when they discharged Stephenson. He had to be re-appointed engineer, and although many difficulties were encountered, he carried out the construction of the line. His salary was £1,000 a year.

Engineers generally, including some called in to advise the directors of the company, strongly advised the use of stationary engines and cables to draw the trains. Stephenson firmly opposed the method, maintaining the superiority of travelling engines with smooth wheels on smooth rails, and saying that this type of engine could be much improved if encouragement were given. Finally, although not a single man of eminence agreed with Stephenson, he got his own way and the directors offered a prize of £500 for the best engine. The Rainhill trials of October 1829 resulted. Four engines from four different firms entered for the competition. The **Rocket**, built by Robert Stephenson and Company of Newcastle, was the winner. George Stephenson drove it. Loaded with a train he obtained the unheard-of speed of 29 m.p.h. Ten miles an hour was the speed mentioned in the conditions of the contest and was the highest speed that dared be mentioned when the Bill was before Parliament. After winning the prize, Stephenson uncoupled the engine from the loaded coaches and ran it along the line at the then terrifying speed of 35 m.p.h., a performance requiring courage if the engine and the permanent way are considered. So-called learned opinions against such a speed Stephenson totally ignored. Eight engines were ordered from Robert Stephenson and Company, and on 15th September 1830 this, the first railway line in the modern sense, was formally opened.

The line continued to be successful. The triumph of Stephenson's railway system was now assured and he subsequently built many railways in England and



on the Continent. Landowners and others who had opposed him now tumbled over each other to invest money in railways and to get railways near enough to their estates to obtain a share in the railway's economic success.

In the railway bubble that followed in 1844-5 he remained as he had always been, a straightforward, honest man, indignantly refusing many offers to allow his name to be associated with doubtful undertakings or financial jugglery. Astute business friends and associates often advised Stephenson to buy and sell his railway shares at appropriate times for large financial gains. As there was always a loser, and Stephenson had rendered no service for the money, he saw a lack of equity in all such transactions. His son Robert once advised him to dispose of holdings amounting to a face value of £60,000 which were standing at a high premium. His reply was, "No, I took my shares as an investment and not to speculate with, and I am not going to sell because people have gone mad about railways." His generous nature is further instanced by offers to poor companies to postpone his claims for fees, until the companies became more prosperous, and he made a preliminary survey of a projected line in Spain without any remuneration. This undertaking, which he reported against as uneconomic, cost him his life. He was laboriously employed for ten days examining the mountain passes and ravines through which the suggested railway was to pass. He slept on the spot fully clothed, in hovels or barns, so as to be at work at daybreak. The leaky roof of one was the cause of his getting wet through one night. Pleurisy resulted and he was got back to England with difficulty. After a few weeks he recovered enough to leave his bed and to get about again but his health was severely shaken and he died two years later of hæmorrhage of the lungs attributable to his illness. His last public appearance was on the 26th July 1848 when he read a paper, "On the Fallacies of the Rotary Engine," before the Institution. He was the chief founder of the Institution in 1847 and the first President, a position which he held until his death.

The Institution was officially founded on a motion moved by George Stephenson at a meeting on 27th January 1847 in the Queen's Hotel (known also as Bacon's Hotel), Curzon Street, Birmingham—not the present hotel of that name. The old Queen's Hotel has long been used as railway goods offices (see Fig 5, page 48). It is situated in Curzon Street adjoining the old terminus of the London and Birmingham Railway. The building is a most conspicuous one with its massive stone façade.

While superintending the making of Clay Cross Tunnel and other railway work in and around Chesterfield, Stephenson perceived the possibilities of the area. He was the leading spirit in establishing the Clay Cross Coal and Iron Company and the lime kilns at Ambergate. He personally opened pits at Tapton, Brimington, and Newbold. Tapton House was included in one of the leases and as it was conveniently situated to many of his activities he made it his home. Here he spent his last years in a dignified and pleasant semi-retirement, retaining his alert faculties until the end. The great American writer, Emerson, met him in Chesterfield early in 1848 at Whittington House, the home of Frederick Swanwick. Emerson remarked later that "it was worth while crossing the Atlantic were it only to have seen



Stephenson—he had such force of character and vigour of intellect.” “He seems to have the life of many men in him.” But he was a stricken man and the end came only a few months later.

Stephenson was always on the look-out for talent in young men, whoever and wherever they might be, and to give that talent encouragement. One youth, a carpenter working on the Liverpool and Manchester Railway, excited his attention; before many years he was, through Stephenson's aid, recognized as an engineer of distinction. Many similar cases could be mentioned. Nothing gave Stephenson more pleasure than to help an able youth and in his own phrase to “make a man of him”.

He took a great interest in the Mechanics' Institutes which flourished at that time and frequently attended those at Chesterfield and Belper. Many inventors came to him for advice. When he went into semi-retirement he gave freely of his time to them. Most of their devices were worthless, but not all. To the inventor of a good steam pressure gauge who asked Stephenson what his charge would be he replied, “Charge! nonsense! I make no charge, but I will tell you what I will do, etc.” What he did do was to test the gauge and publish a letter recommending it. One of Stephenson's objects in assisting to found the Institution was to establish an organization by means of which genuine inventors could get the advice and assistance denied to him in his early days.

Stephenson never forgot his relatives and old friends. Several persons who had helped him in his early life received annuities from him which were paid after his death by his son, Robert. It was no unusual thing for Stephenson to shake hands formally with the occupant of a coach in which he had been riding and then to shake hands fervently with the coachman, an old friend. On his journeys to Newcastle and Killingworth he would seek old companions, occupying much the same positions as in his early days, but his greeting of them was just as hearty and natural as if their relative positions had remained the same.

Stephenson has often been erroneously called, and will no doubt often continue to be so called, the inventor of the locomotive. This honour belongs to Trevithick, and after him came others with improvements before Stephenson built his own early locomotives. In the **Rocket**, Stephenson combined existing knowledge with his own engineering acumen and good workmanship. To have built this locomotive, which proved itself to be by far the best submitted for contest in an open competition, was a great achievement and alone made his name remembered. It was, however, little more than an incident in his career. As the “Father of Railways” he has a much greater claim to fame. In his mind the essentials of the modern railway system of the world were conceived and by his hand and genius they were realized. He showed the world the economic possibilities of railways and he taught the world how to make railways.



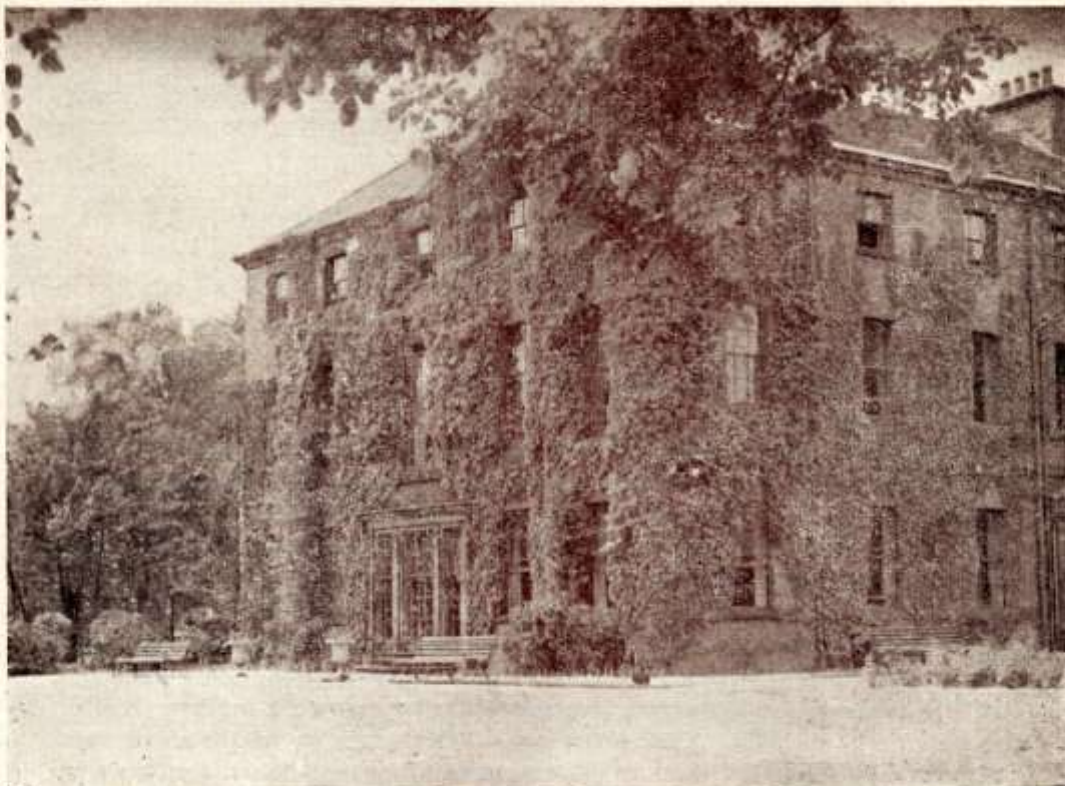


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### *Tapton House : The Home of George Stephenson*

Samuel Smiles in "The Life of George Stephenson" (1857) says: "Tapton House is a large roomy brick mansion, beautifully situated amidst woods, upon a commanding eminence, about a mile to the north-east of the town of Chesterfield . . . . ."

"The gardens and pleasure-grounds adjoining the house were in a very neglected state when Mr. Stephenson first went to Tapton; and he promised himself, when he had secured rest and leisure from business, that he would put a new face upon both. The first improvement he made was in cutting a woodland footpath up the hillside, by which he at the same time added a beautiful feature to the park and secured a shorter road to the Chesterfield station. But it was some years before he found time to carry into effect his contemplated improvements in the adjoining gardens and pleasure-grounds. He had so long been accustomed to laborious pursuits, and felt himself so full of work, that he could not at once settle down into the habit of quietly enjoying the fruits of his industry . . . . ."



"The rest of George Stephenson's days were spent quietly at Tapton, among his dogs, his rabbits and his birds. Although he had for some time been in delicate health, and his hand shook from nervous debility, he appeared to possess a sound constitution; but he had never completely recovered from the attack of pleurisy which seized him on his return from Spain. Shortly after his return to Tapton he had an attack of intermittent fever, from which he seemed to be recovering, when a sudden effusion of blood from the lungs carried him off, on the 12th August, 1848."

After George Stephenson's death Tapton House probably reverted to the owner, Mr. G. Y. R. Wilkinson. Whether he lived in it we cannot be sure, but in 1857 it was occupied by the Misses Pocock and Walker as a boarding school. In view of its present use this information is most interesting, and a monograph on this early school, could the facts of history be obtained, would be particularly attractive to present day children.

Miss Violet Markham has kindly given us what information she has about this early period. Soon after Stephenson's death the house must have become a school, for Miss Markham's mother and aunt were sent there about 1849. "My mother," Miss Markham writes, "was at school for five years, and her initials and those of her sister, still remain carved on a tree in the garden. Intellectually I do not think the school made much impression on her, but one incident about which she often spoke in later years may be worth recording. My mother had always a great gift for reading aloud. Charles Dickens' novels were appearing during her schooldays, and the girls would collect secretly after bedtime in the dormitories while my mother, furnished with a candle-end, would sit on a little stool in the middle of the room and read with bated breath to the assembled company. These readings were brought to an end by one excitable girl becoming hysterical over the scene in 'Oliver Twist' where Nancy is killed by Bill Sykes. The noise brought a governess on the scene and the culprits were, of course, heavily punished."

In 1916 Miss Markham wrote that her father had bought the house forty-five years before. The Markham family lived on at Tapton House until our own time, and the great work that its various members have done for the welfare of Chesterfield is well-known and appreciated by all who have any knowledge of the district.

Tapton House is now a Modern County Secondary School, and is one of the best assets that Chesterfield has; and the Headmaster, Mr. H. Mellor, M.A., and his staff, are feeling their way firmly to the realisation of the ideals inspired by the status of their school.

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**CHESTERFIELD BOROUGH EDUCATION COMMITTEE**

**Borough Education Officer : A. GREENHOUGH, B.Sc. (Lon.) L.C.P.**

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## *The Stephenson Centenary and the Chesterfield Schools*

The 22 Primary Schools, 12 Secondary Schools and one Special School of the Borough are taking advantage of the Centenary Celebrations of George Stephenson to relate a study of his life and work to the work of the school as a whole. Each school has approached the Centenary from its own particular angle and as a result a great variety of treatment is being shown. It is, therefore, not possible to describe in any considerable detail the work in each school. Some schools for instance have chosen the 'project' method whereby the life and work of George Stephenson has been made the focal point for the whole of the work of the school during the term. Others have treated the subject in a series of special lessons. Most of them, however, have made a feature of visiting the places in the district most closely connected with Stephenson.

The Art and Modelling classes of one primary school are being devoted to drawings and models of railway features such as trains, bridges, tunnels, etc. The top class of a junior school is relating Stephenson's work to a study of Power through the ages from manpower to atomic power. Children in another class are each producing a small handbook with narrative and pictures showing the development of Chesterfield. The children of an infant school are co-operating in the production of a large frieze, the subject of which is a journey on the Rocket. Scale model engines are being made in the workshop of a secondary school to illustrate the technical development of the railway. In the English lessons of a secondary school a play based on the Manchester to Liverpool project is being prepared and in a school with its own film projector films and slides of railways and locomotives are being shown. Stephenson and the railways are the theme of the science, geography, history, art and craft work for the whole term in another secondary school. In a junior school a section of railway line is being constructed with examples to scale of a train in Stephenson's time and a modern train on it. The girls of one school are planting a tree in the school grounds to commemorate the Centenary and a George Stephenson Week is being held at a primary school in July.

The above examples are taken at random from the schemes of work of the schools in the Borough and the following detailed scheme from one school shows the way in which the Stephenson Centenary has been related to the whole of the work of the school.



1. **Science and Machine Drawing.**

A course of lessons on the development of the locomotive as a machine from pre Rocket days to the present time.

2. **Geography.**

The growth of railway systems throughout the world, their influence on man through the opening up of new lands, industries, etc.

3. **History.**

Travel before and after Stephenson. The passing of the Stage Coach, the Post-ing House, etc. The connection of Stephenson with Chesterfield. A biography of Stephenson.

4. **Art.**

Posters announcing the Centenary. A frieze showing the various types of loco-motive since 1825.

5. **Metalwork.**

Construction of a model of the Stephenson 'link motion' valve gear.

In this way children in the schools of Chesterfield will become familiar with the life and work of one of the great men of their town and of the country as a whole, and at the same time their studies over a very wide field will have been enlivened by a topical and local interest.

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### George Stephenson: 1781-1848

As he who feeds the unleashed night-express  
Leans back to shade his eyes—averted, screwed  
Into the dark—now sees beyond the stress  
Of that first moment's furnace-glare the crude  
Trees leap to sudden sentinels of life  
That fling at him their shout, so we, the needs  
Of mankind serving, pause from fires of strife,  
And turn to hear the challenge of your deeds :  
A sane endeavour signals clear your way,  
And wisdom to improve where others failed ;  
Humility to learn ; doubt held at bay ;  
Impending powers manfully assailed ;  
And, like a ruthless star-shell in the night,  
Tenacity, that floods your years with light.

—J. K. G. HOFFMAN



**Borough of Chesterfield**  
**George Stephenson Centenary Commemoration**

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*Opening Ceremony*

*12th August, 1948, Town Hall, Chesterfield*  
*at 2 p.m.*

The proceedings will be officially opened by

**The Right Hon. LORD KENNET, P.C., G.B.E., D.S.O., D.S.C.**  
(President: Association of Municipal Corporations)

Supported by

**SIR ROBERT ROBINSON**

Professor of the Royal Society, Waynflete Professor of Chemistry at  
Oxford, Nobel Prizewinner, Freeman of the Borough of Chesterfield.

**MAJOR WILLIAM GREGSON, M.Sc., M.I.Mech.E.**  
(President: Institution of Mechanical Engineers)

**MISS VIOLET R. MARKHAM, C.H., J.P., Litt.D.**

**GEORGE BENSON, Esq., M.P.**

**J. J. B. ROSE, Esq. (Ulverston)**

The oldest known living descendant of George Stephenson

**HIS WORSHIP THE MAYOR (Alderman Edgar Smith)**

**THE MEMBERS OF THE COUNCIL**

**THE MEMBERS OF THE STEPHENSON CENTENARY COMMITTEE**  
and other invited guests

At the close of the proceedings the invited guests will pay a private visit to  
the Holy Trinity Church where floral tributes will be placed on the Tomb of  
George Stephenson





MAYOR'S PARLOUR  
CHESTERFIELD

## *George Stephenson Memorial Fund*

The world owes a debt to the memory of George Stephenson on account of his development of the locomotive. The town of Chesterfield, in the Derbyshire coalfield, where he lived and worked for so long, has a special responsibility, because George Stephenson is buried near the Altar of Holy Trinity Church. The gravestone, however, is at present hidden and very unsuitable as a memorial to so great a man.

A scheme for a George Stephenson Memorial which would make the surroundings of George Stephenson's grave more worthy was interrupted by the war, when the sum of £1,200 had been raised.

As Mayor of Chesterfield, I consider that during this Centenary year the necessary funds for this Memorial should be collected, and I appeal to the public, and particularly to Engineering, Mining and Railway organisations in this country and abroad to subscribe to the fund which has been organised.

It is estimated that the cost of the work will be £10,000, and this is the amount we are hoping to receive in subscriptions. If, when the time comes, it is found that building is cheaper and that the grave can be made a suitable memorial for a less sum, then any surplus funds would be used at the discretion of the trustees, probably for educational purposes and the foundation of George Stephenson Engineering Scholarships.

EDGAR SMITH,  
Mayor,

Subscriptions to: His Worship the Mayor of Chesterfield (George Stephenson Memorial Fund), Town Hall, Chesterfield.



## *Civic Commemoration Service*

**A** COMMEMORATION Service, to be attended officially by the Mayor, Aldermen and Councillors of the Borough, will be held in Holy Trinity Church, Chesterfield, where George Stephenson is buried, on Sunday, August 15th, 1948, at 3-0 p.m. The Service will be conducted by the Rector of Holy Trinity (Rev. E. Garston Smith, M.A.) and the Archdeacon and Vicar of Chesterfield (Ven. T. Dilworth-Harrison, M.A.), and the Address given by the Lord Bishop of Derby (Right Rev. A. E. J. Rawlinson, D.D.). The President of the Chesterfield Free Church Federal Council (Rev. J. Gibson Barbour, M.A.), will read the Lesson.

### *Order of Service*

PROCESSIONAL HYMN. "O God, our help in ages past."

SENTENCES.

COLLECT AND LORD'S PRAYER.

VERSICLES AND RESPONSES.

PSALMS 113, 15.

LESSON (Ecclesiasticus 44 ; 1-15).

HYMN. "The Lord's my Shepherd."

PRAYERS.

Prayer for H.M. the King and the Royal Family.

Prayer for the Mayor, Aldermen and Councillors of the Borough.

PRAYER OF COMMEMORATION.

"ALMIGHTY GOD, our Heavenly Father, from whom cometh every good and perfect gift, we give thee thanks for the life of George Stephenson and for the benefits which his labour and skill have conferred upon mankind. We humbly beseech thee so to give us grace that with a like perseverance in the face of difficulties, and putting aside all selfish and unworthy aims, we may serve thee faithfully in our generation, and finally by thy mercy obtain everlasting life ; through Jesus Christ our Lord.—Amen."

THE GRACE.

HYMN, "Fight the good fight with all thy might."

ADDRESS.

HYMN. "Disposer Supreme and Judge of the Earth."

(Offertory for the Stephenson Memorial in Holy Trinity Church.)

THE BLESSING.



Chesterfield Parish Church

FRIDAY, 13th AUGUST, 1948

at 3 p.m.

Organ Recital

by

CHARLES A. BRYARS, Mus. Bac., F.R.C.O., L.R.A.M.

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ORGAN	Symphony No. 4 in F. ....	Boyce
ORGAN	Adagio in E. ....	F. Bridge
SOLO	Angels ever bright and fair ..... (Chorister : John Cartledge)	Handel
ORGAN	Sonata No. 1 .....	Harwood
ORGAN	"Nimrod" .....	Elgar
SOLO	My heart ever faithful ..... (Chorister : Michael Irwin)	Bach
ORGAN	First Movement, Organ Sonata .....	Elgar
ORGAN	Londonderry Air .....	Traditional
ORGAN	Last Movement, Sonata Celtica .....	Stanford



# *Commemoration Service*

EVENSONG ON SUNDAY, 15th AUGUST, 1948  
at the Chesterfield Parish Church

## *Order of Service*

SENTENCE :  
LORD'S PRAYER

VERSICLES AND RESPONSES :  
PSALMS 46, 47

LESSON :  
ECCLESIASTICUS XIII, 15

HYMN : "Put thou thy trust in God" (A. and M. 672)

MAGNIFICAT

LESSON :  
PART OF REVELATION, 21-22

ANTHEM : "Let us now praise famous men"  
Music by C. A. BRYARS

NUNC DIMITTIS, CREED, VERSICLES and PRAYERS

HYMN : "O God of Love" (A. and M. 376)

INTERCESSIONS

HYMN : "Stand up and Bless The Lord" (A. and M. 706)

SERMON : THE ARCHDEACON OF CHESTERFIELD

HYMN : "The King of Love" (A. and M. 197)



## Britain's Railway Queen

**O**N the initiative of the local Branches of the National Union of Railwaymen, the Associated Society of Locomotive Engineers and Firemen, and the Railway Clerks' Association, Britain's Railway Queen has graciously accepted the invitation of the Stephenson Centenary Sub-Committee to attend the Centenary Commemoration.



MISS JANET TAYLOR.  
Britain's Railway Queen.

The Railway Queen stands for good-will, industrially and internationally. Her chain of office is made of gold models of railway couplings, each link presented by the railwaymen of various countries of the world, and the United Nations Association emblem which she wears was presented by the United Nations Association of Great Britain and Ireland at Unesco House, Paris, last year.

The reigning Railway Queen is the daughter of a Leeds railway motor driver, and is the seventeenth Railway Queen.

The Railway Queen will arrive at the Chesterfield (London Midland Region) Station at 3-0 p.m. on **Friday, 13th August**, and will be received by representatives of the organised Railwaymen. She will proceed to the Town Hall, where she will be welcomed by His Worship the Mayor (Alderman Edgar Smith, J.P.) and members of the Stephenson Centenary Sub-Committee.

During her visit the Railway Queen will attend the following functions:—

### **Friday, 13th August.**

**RAILWAY QUEEN'S DANCE** at the Odeon Ballroom, Holywell Street, Chesterfield, at 8-0 p.m.

### **Sunday, 15th August.**

**OPENING OF THE RAILWAY EXHIBITION** at the Market Place Station, West Bars, Chesterfield, at 10-0 a.m.

**COMMEMORATION SERVICE** at the Holy Trinity Church, Newbold Road, Chesterfield, at 3-0 p.m., where she will lay an Evergreen Wreath on the Tomb of George Stephenson, on behalf of the British Railways Executive and Railway Trade Unions.

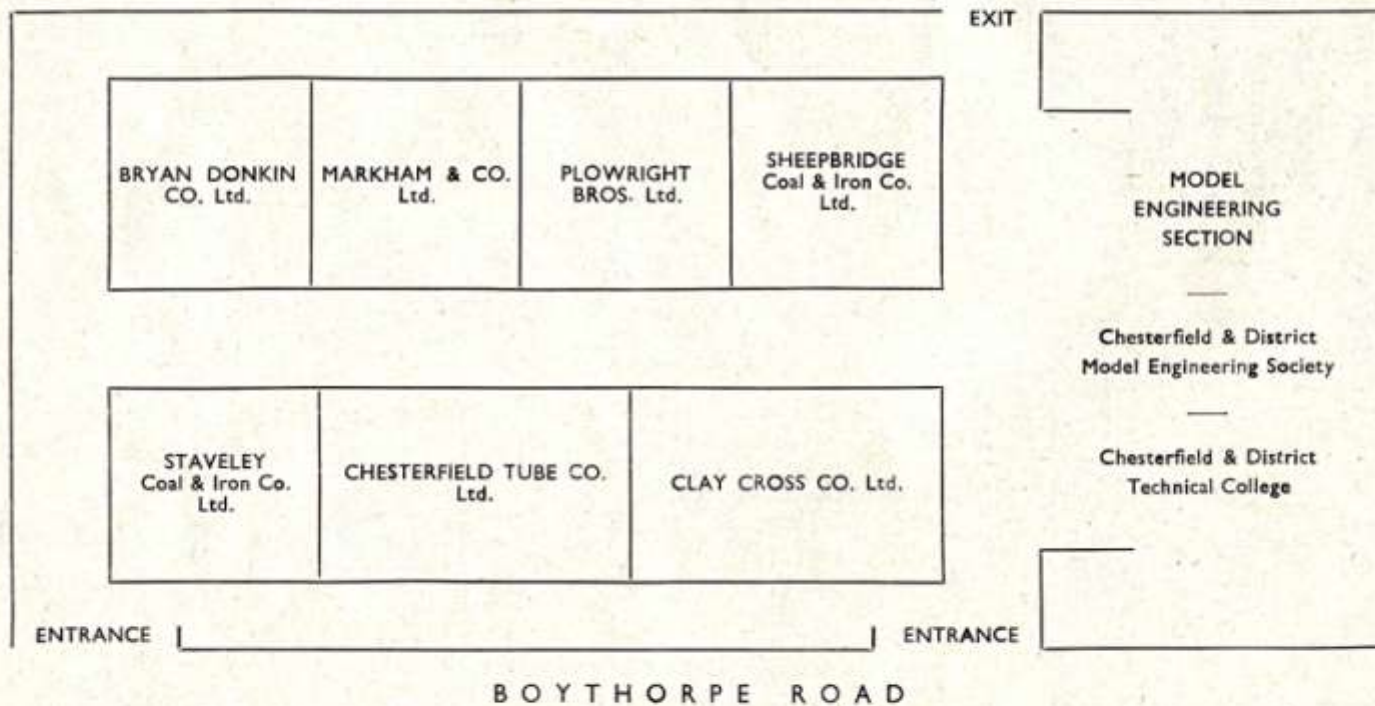
**RAILWAYMEN'S COMMEMORATIVE MEETING** at the Co-operative Hall, Elder Way, Chesterfield, at 7-0 p.m. The Railway Queen will be accompanied by the following speakers: Mr. M. Pounder (N.U.R.), Mr. J. G. Baty (A.S.L.E.F.), and Mr. R. J. Gunter, M.P. (R.C.A.). The Chair will be taken by Miss Violet R. Markham, C.H., J.P., Litt.D.



# ENGINEERING EXHIBITION

## BOYTHORPE ROAD DRILL HALL

August 12th to August 28th, 1948



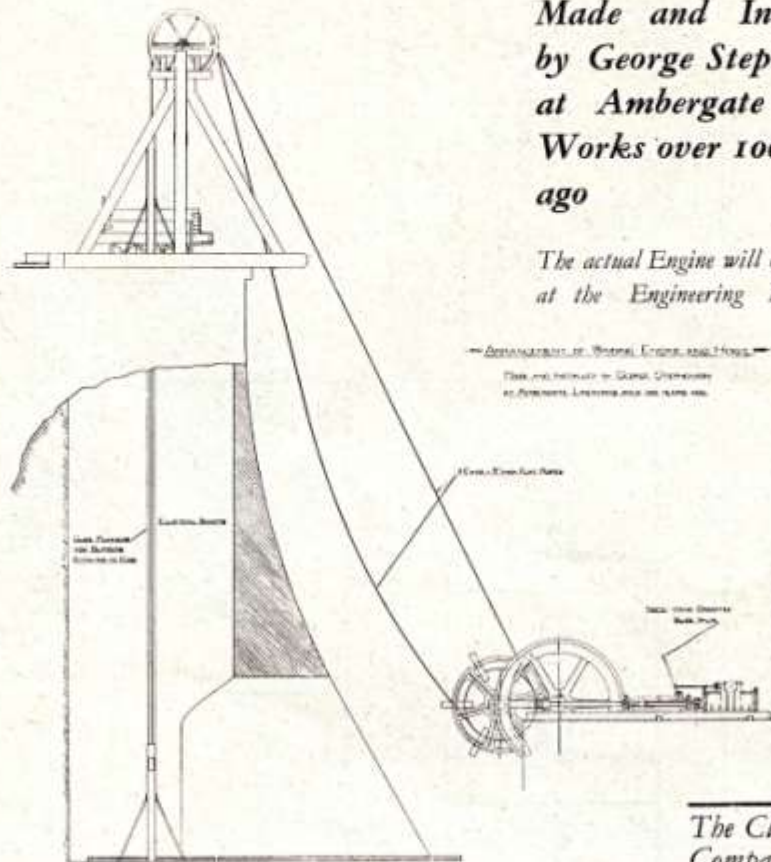
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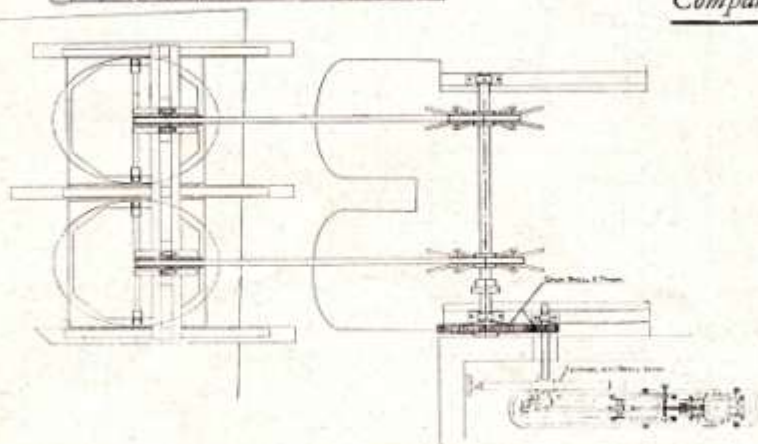
# Winding Engine and Hoist

Made and Installed  
by George Stephenson  
at Ambergate Lime  
Works over 100 years  
ago

The actual Engine will be on view  
at the Engineering Exhibition



The Clay Cross  
Company, Ltd.







The 5,000-ton billet-piercing press used in the production of large cylinders and other weldless steel tubular products weighing up to 20 tons and measuring 54 inches in outside diameter, at the Works of the Chesterfield Tube Company.

From the water-colour drawing by Edward Walker, A.R.C.A.



# The Bryan Donkin Company, Limited

Engineers, CHESTERFIELD.

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## *List of Models for Exhibition*

KIOSK AND DISTRICT GOVERNOR in Cabinet.  
2-BLADE EXHAUSTER fitted with Screw Down Valves, Lubricator, etc.  
4-BLADE EXHAUSTER.  
MULTI-BLADE BLOWER.  
SCREW DOWN VALVE.  
HICKS TYPE VALVE for High Pressure Gas.  
BAURER VALVE for High Pressure Gas.  
RACK AND PINION VALVE for Low Pressure Gas.  
COKE OVEN VALVE for Low Pressure Gas.  
WORM AND RACK VALVE for Low Pressure Gas.  
Model of "FAREY" COMPOUND STEAM ENGINE, Piston Arrangement.  
Engine first built, 1858.  
MODERN GAS WORKS.  
GAS ENGINE DRIVEN DYNAMO.

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## *Engineering Exhibits*

RETORT HOUSE GOVERNOR.  
CENTRIFUGAL PUMP.  
CENTRIFUGAL FAN.  
CONNERSVILLE BLOWER as used for supercharging Diesel Engine.  
"Star" Type FAN IMPELLER, cut from Solid Forging. Speeds up to 10,000 r.p.m.  
Various SPECIAL CASTINGS and MACHINED COMPONENTS, for Plants  
manufactured by The Bryan Donkin Company.  
ENGINEERING DRAWINGS, Old and New.

The name of "Donkin" reveals associations with such famous Engineers as Smeaton, Telford, Rennie, Bramah, Boulton & Watt, Murdock, Simpson, John Hall, Sir Wm. Congreve, Maudsley, Brunel, Penn, Nasmyth and others.



## Details of Exhibits

to be exhibited by

### The Chesterfield Tube Co., Ltd.

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Working Model of TUBE DRAW BENCH, kindly loaned by Tubes, Limited, Birmingham.

Working Model of 2—4—0 LOCOMOTIVE AND TENDER, with glass boiler showing the loco tubes, kindly loaned by British Railways (Western Region).

Model of M.S. & L. Company's LOCOMOTIVE No. 60, kindly loaned by British Railways (Eastern Region).

Model of WALKER NAVAL SHIPBUILDING YARD, kindly loaned by Messrs. Vickers-Armstrongs, Limited.

Model of POWER HOUSE, comprising three water tube boilers, each of 150,000-lbs. evaporation, stoker and blast furnace and other accessories, kindly loaned by Messrs. John Thompson Water Tube Boilers, Limited.

Model of STEEL MAKING PLANT, kindly loaned by Messrs. Thos. Firth & John Brown, Limited.

Model of LIGHT CRUISER (H.M.S. Ceres), kindly loaned by Messrs. Thos. Firth & John Brown, Limited.

Various STEEL TUBULAR PRODUCTS supplied to the British and Overseas Railway, Shipbuilders, Boilermakers and other Industries.

Working Model demonstrating the COLD DRAWING OF "SWIRLYFLO" BOILER TUBES, kindly loaned by Talbot Steel Tube Co., of Walsall, Staffs.

## The British Thomson-Houston Co. Ltd. Rugby

Of particular interest to all users of electricity is the scale model of part of the new Staythorpe Power Station, which is now under construction for the Derby and Notts. Electric Power Company. The model shows in appreciable detail the main and auxiliary machinery, control gear, and pipework, associated with the production of electricity. It is intended to convey a detailed impression of power generating machinery in its most modern form, starting from the arrival of raw coal and finishing with the supply of electric current to the step-up transformers.

Staythorpe Power Station is designed for an output of 360,000 kw. to be obtained from six 60,000 kw, 3,000 rpm. turbo-alternators. The BTH Company has in hand orders covering two turbo-alternators to be commissioned in the winter of 1949-50, one in 1950 and one in 1952.

### OUTSTANDING ATTRACTION

The model is of half the first section, i.e. three boilers and one turbo-alternator, and the scale is 3-16th. inch representing 1 foot. It was the outstanding attraction of the BTH Exhibits at the British Industries Fair, Castle Bromwich, Birmingham, 3-14 May, 1948, and, at this Exhibition it will be shown on the Chesterfield Tube Company's Stand.

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## The Clay Cross Company Limited

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There are two outstanding exhibits on this Firm's stand.

FIRST: Engine, single cylinder, 12-in. dia. x 30-in. stroke, **made by George Stephenson**, fitted with C.I. Piston Block and two Ramsbottom Rings Slide Valve hand operated; 2-in. steam inlet, 4-in. dia. exhaust. Fly Wheel, 8-ft. 4-in. dia. Overall size, 2ft. 3-in. wide x 15-ft. 4in. long.

This Engine has been in daily use from 1841, to the end of 1946, for raising and lowering a cage from ground level to the top of lime kilns at Ambergate. We are indebted to the Clay Cross Company for their permission to reproduce the drawing of this remarkable exhibit.

SECOND: Steam Haulage Single Cylinder, 7-in. dia. x 18-in. stroke, fitted with **the first link motion ever to be made** and patented by George Howe. Overall size, 11-ft. 0-in. x 10-ft. 0-in. wide, 6-ft. 0-in. dia. flywheel; the power transmitted to the 4-ft 0-in. dia drum, 5-ft. 0-in. wide, through spur and pinion. Steam inlet, 2-in.; exhaust, 2-in. dia.



**MARKHAM & CO., Ltd.**  
**Broad Oaks Works    Chesterfield**

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**DETAILS OF EXHIBITS**

**SKIP WINDING EQUIPMENT MODEL**

The Model is based on the actual requirements for a British Colliery, the depth of shaft being 960 yards, with skips 10½ tons capacity, capable of raising 380 tons of coal per hour ; the winding time is 80 seconds, and for loading and discharging an additional 14.8 seconds.

**MODELS OF ELECTRIC AND STEAM WINDERS**

There will be one model on a stand of an Electric Winder, and a similar model for a Steam Winder. These models have been kindly loaned to Messrs. Markham & Co. by Mr. Smith of Pinxton, and will be of interest to expert and layman alike.

**THE FIRM'S MANUFACTURES**

This display of manufactured articles will indicate the variety of products from the Broad Oaks Works.

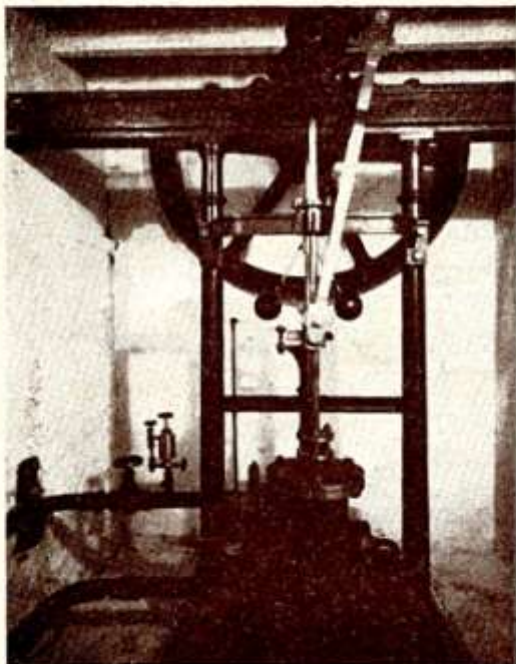
***PLOWRIGHT BROS., LTD.***  
**BRAMPTON IRONWORKS, CHESTERFIELD**

This firm's exhibit will display components of their complete Coal Preparation Plants, incorporating the Chance Washing Process, for handling the run-of-mine coal from pit bottom to wagons. Large scale illustrations will show Underground Tub Control and Tipplers, Headgears, Pit Cages, Screens, Coal Breakers, Conveyors, Elevators, Air Locks, Skip Hoists, Tram and Mine Car Controllers, Underground Haulage Gears, Steel Structures of all descriptions, Arc Welded Fabrications, etc. A most interesting Exhibit demonstrating the application of scientific development to modern needs.

# The Sheepbridge Coal & Iron Co. Limited

## AND ASSOCIATED COMPANIES

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The chief exhibit of historical interest on this Stand will be an old Steam Engine, as illustrated, believed to have been built by Maudslay, Sons & Field during the period 1825 to 1850. This Engine is in perfect mechanical condition and working order, and was in regular use grinding corn for pit ponies until the end of 1946, when the Collieries were taken over by the National Coal Board. The Engine was probably working during the lifetime of George Stephenson.

- (1) An example of the smallest size of the Kennedy Gyrotory Crusher. This type of Crusher is used for breaking down all types of rock, ore, slag, etc.
- (2) A small example of the firm's Portable Haulage Gears as used for hauling Pit Tubs in Coal Mines.
- (3) An example of Hydraulic Tub Retarders used for controlling the speed of tubs on inclines.
- (4) A transparent model of a Portable Haulage Gear, showing the internal epicyclic gearing.
- (5) A Bristol Aero Engine, for which large quantities of centrifugally-cast cylinder liners were made in the Sheepbridge Works.
- (6) Other samples and models of the firm's manufactures.



## The Staveley Coal & Iron Company, Limited

*EXHIBITS:*

PIG IRON  
REFINED IRON  
CAST IRON PIPES  
SPECIAL CASTINGS  
FLEXIBLE JOINTS  
AXLE BOXES  
BRAKE BLOCKS  
FIREBARS

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TAR PRODUCTS  
C H E M I C A L S

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SALT            LIME

## The Chesterfield and District Model Engineering Society

**T**HIS Society was formed in September, 1947, and soon became so popular that, by the end of April, 1948, the membership figure had risen to over a hundred and is still increasing, slowly but surely. This ought to have been named a Friendly Society, as the general atmosphere dispels any fear of enmity for any visitor or new member.

Covering the Chesterfield district in the "Centre of Industrial England", there is no wonder at the interest shown in modelling all types of Engineering prototypes. The various sections of the Society cover practically all classes of models, including Railways and Locos, Stationary Engines, Planes, Boats and Cars.

Many fine examples of work have been and are being carried out, and one has only to see the detail in the models shown, whilst experiencing the great difficulties in obtaining suitable materials, etc., to be able to realise the tremendous amount of patience and skill shown by the builders. Many of these models are real engineering projects, designed, drawn, built and erected by the members themselves, who in daily life are often entirely removed from the sphere in which they are

interested as model engineers, for example : a postman may be building a model loco, whilst an engine driver is more interested in a scale model cargo steamer.

There is no doubt that the members of this Society are following the illustrious example set by George Stephenson himself in so far as, not only has the model to appear as "very like" the original, but also that the builder is not satisfied until he obtains the resultant scale efficiency of the prototype. This in itself entails a great amount of thought and experiment, thus proving the pioneering spirit of the members.

"Patience is a virtue" which must be possessed by all Model Engineers and one may easily recognise this if a thorough examination is made of such models as the miniature working Model Workshop and the world's Smallest Engine, built by Mr. Cobb. Through the Planes and Boats, etc., to the other end of the scale we arrive at Loco Models, which usually are very near to exact replicas of originals, yet in many cases capable of hauling very heavy loads under working conditions.

Under present-day conditions, with tools and materials at a premium, many difficulties have to be overcome, but apparently the greater the difficulty the greater the pride of achievement shown when the model is completed. If a careful scrutiny is made of the models on display one may see a record of Engineering History through the past century, and often in the Chesterfield district, situated as it is in the heart of the Derbyshire coalfield, one cannot fail to be impressed by the progress and development which invokes the memory of George Stephenson, who did so much in his life as a mining engineer.

As anyone may easily guess, Model Engineers are very busy people, and spend thousands of happy hours by the bench or the lathe in the "den" or workshop, so much so that, on a visitor calling to see one of the members, said to his good lady, "Does Mr. —— live here?" ; and the reply was, "No, he only eats and sleeps here !"

Membership of this Society is open to boys (and girls) of all ages from fourteen to sixty or more, and the fees for membership are quite moderate in view of the amenities obtainable. By the kind permission of the Directors of Messrs. Robinson & Sons, Ltd., the Society has a permanent home in the spacious and comfortable Hartington Room in the Bradbury Hall. Here the members meet to discuss their model building and listen to many interesting talks given on many various engineering and scientific subjects.

The sailing of model boats and aeroplane flying is catered for at Walton Dam and the adjacent Sports Ground respectively, permission for use of which was so kindly given by the above-mentioned firm, to whom the Society are greatly indebted.

The Society is fortunate in having for its President Theo. Pearson, Esq., J.P., whose Model Railway is known the whole length and breadth of England by virtue of its broadcast in the Children's Hour by the B.B.C.

It is hoped that visitors to the Centenary Exhibition who make a point of seeing the models will obtain as much pleasure from doing so as the members have had in building them.



## The Chesterfield and District Technical College

**G**EORGE STEPHENSON began to learn to read at the age of 18, and it was not until he was 19 years old that he could write his own signature, much to his pride and satisfaction. Nowadays, at 18, the apprentice engineer can have secured his Ordinary National Certificate, involving no mean knowledge of mathematics and engineering science. Within a few years he can, whilst still continuing to earn his living, be well on the way towards his engineering degree. Such progress in educational opportunities has been accompanied by a corresponding expansion in the provision of instruction in Technical Colleges, of which Chesterfield's is a worthy example.

Opened in 1927 with about 700 students, this College has enrolled over 2,500 students in the session just completed. Its work is carried out in six Departments—Commerce and General Education, Chemistry and Metallurgy, Civil and Mechanical Engineering, Electrical Engineering, Building, and Mining.

It is interesting to note that one of the objects for which the Stephenson Memorial Hall was conceived and built was to house a Technical Institute. To-day, however, so great is the demand for further education that the large College building is totally inadequate, and on winter evenings three other buildings in Chesterfield are occupied by College classes.

### THE EXHIBITION.

The stand is laid out in three sections—electrical engineering, mechanical engineering, and a section dealing with some facets of engineering at the time of George Stephenson.

Mechanical engineering exhibits include modern examples of industrial measuring equipment, as well as a selection of some of the more portable items of engineering apparatus belonging to the College. Certain of these will be shown in operation, and visitors should be able to visualise the valuable part played by experimental apparatus in the training of young engineers.

The electrical section is devoted mainly to the historical development of electrical discharges in gases and in a high vacuum. The evolution of the modern low voltage Cathode Ray Tube, as used in Radar and Television, is traced. Gas discharge lighting, including the fluorescent lamp, working exhibits of up-to-date applications of electronic techniques, and various types, both past and present, of the radio valve, will also be on view.

In the third section will be found a laboratory vacuum air pump, which was the property of George Stephenson and is still in working order. Another interesting exhibit is an early model of the Stephenson Link Motion, dated 1842. A pictorial display from the College collection is designed to bring out the advances which have been made since the time of George Stephenson.



# National Coal Board Exhibition

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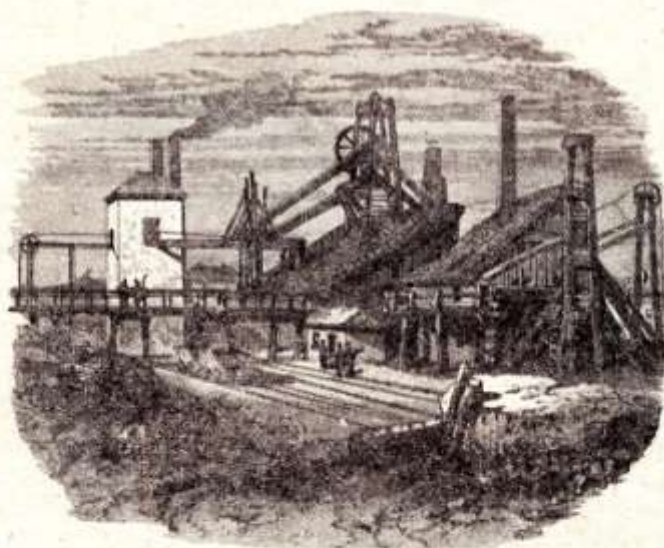
The National Coal Board Exhibition is being staged in the Ashgate Road Drill Hall, Chesterfield, from 12th to 28th August, 1948.

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## GEORGE STEPHENSON'S CONNECTION WITH COAL-MINING.

In the last two years, the importance of coal to the national economy has been brought before the public more forcibly than ever before. It is, therefore, worth remembering that the Industrial Revolution was made possible largely due to the work of George Stephenson in producing a means of carrying coal to the consumer, whether industrial or domestic. His early work on locomotives was prompted by the necessity of finding a more economical means of coal-carrying than the existing horse transport, and the Stockton and Darlington Railway was originally intended only for the sale of coal at stations along the route.

From his birth, George Stephenson was connected with coal-mining and, therefore, the National Coal Board takes particular pride in presenting to the public this exhibition of mining past and present as a tribute to his pioneering spirit.



West Moor Colliery, Killingworth.

*Reproduced by permission of John Murray.*

Part of the Information Section of the Exhibition deals with George Stephenson's connection with the industry, from his birth at Wylam Colliery until the end of his time at Killingworth as enginewright, when he left to take up railway construction.

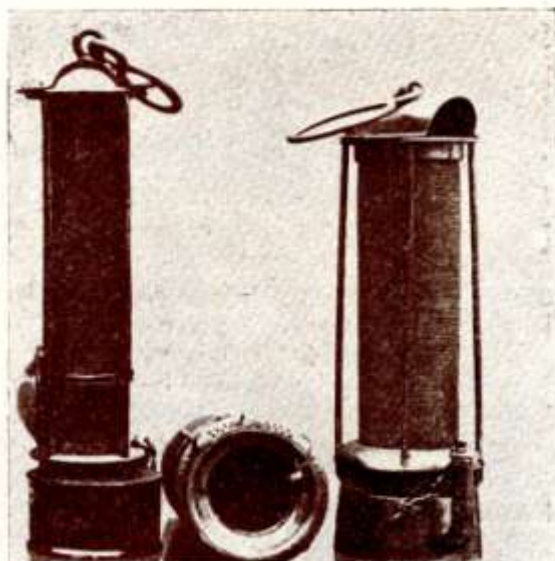
Later he returned to mining, opening shafts at Snibston in 1831, and, in 1837, when he retired from active railway work, he opened up Clay Cross Colliery.



In 1815 he had invented a miner's safety lamp and, according to contemporary reports, he was ahead of Davy in the use of a safety lamp underground.

Also on view is a history of mining from the earliest days, with examples of early tools and machines which are the forerunners of to-day's developments.

A collection of safety lamps shows how they have evolved from Stephenson's day to the present experiments being carried out with fluorescent lighting.

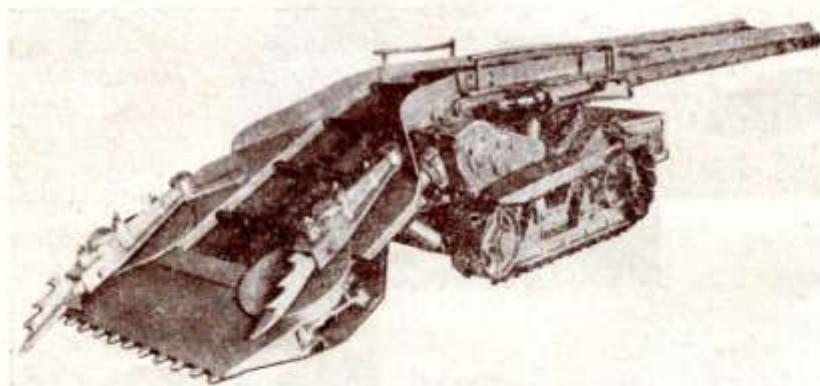


The Davy Lamp and the Stephenson Lamp,  
*Crown Copyright. Reproduced by courtesy of the director of the Science Museum,  
South Kensington*

### *Models of Modern Machinery*

Models of modern machinery include the Joy Loader and the A.B. Meco Moore Cutter Loader.

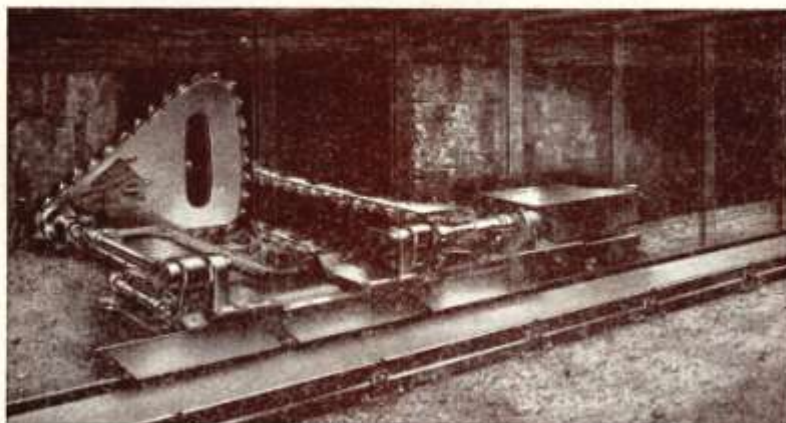
#### THE JOY LOADER.



The Joy Loader, which is made in Glasgow, consists essentially of a central truck moving on crawlers, which pushes the gathering head into a pile of coal. The two claw-like gathering arms pull the coal on to the central scraper chain conveyor, which delivers the coal at the other end by means of a jib on to a main conveyor or direct into a shuttle car. This jib can be swung horizontally through

an angle of 45° on either side, and can also be raised or lowered vertically. The gathering head, too, can be raised or lowered, and the capacity of the machine, varying with the size, is from one to eight tons a minute.

#### THE A.B. MECO MOORE CUTTER LOADER.



The A.B. Mecco Moore Cutter Loader, a British machine, cuts and loads the coal in one operation without the use of shot-firing. The cutter, with its two jibs, hauls itself along the face by winding up a cable on a drum. The loader portion, attached to the front portion, carries the shearing jib which cuts the coal at the back of the cut. The coal falls down, or is forced down by the loader bar, and moves on to the transverse conveyor belt, which delivers it on to the face conveyor. When it reaches the end of the cut, the machine is reassembled to cut in the other direction.

The output with this machine varies with the thickness of the seam, but, to cite a particular case, 13 men produced 324 tons in one day, an output which by other methods would take 24 men.

#### *Representation of a Coal Mine*

The main feature of the Exhibition is a realistic representation of a coal mine in the Drill Hall itself. In this mine, visitors are taken for a ride in the cage down to the bottom of the shaft, where they are met by a guide. The lay-out of the workings is explained and they pass along the roads to an airlock, from where they continue to the loader-end. Here the coal from a conveyor belt is being loaded into tubs. The conveyor leads to the coal-face, where the process of cutting, drilling and firing the coal preparatory to loading is explained by an experienced miner. After a visit to the face, the road leads them back to another air-lock, and thence to the bottom of the upcast shaft for the ride back to the surface.





## Cinematograph Shows

Organised by The National Coal Board  
Assembly Room, Market Hall, Chesterfield  
August 12th to August 28th, 1948

*The Films will include :*

**"Mining Review"** (Topical Magazine of the Mining Industry)  
**"Progress Parade"** (showing the modernisation of Mining)

*Special Youth Films :*

**"Adventure of Coal"**      **"We've Got What it Takes"**  
(Illustrating the vital importance of The Battle for Coal)

*Supporting Films from the British Railways and the Engineering, Iron,  
Steel and other Industries*

STEPHENSON CENTENARY COMMEMORATION

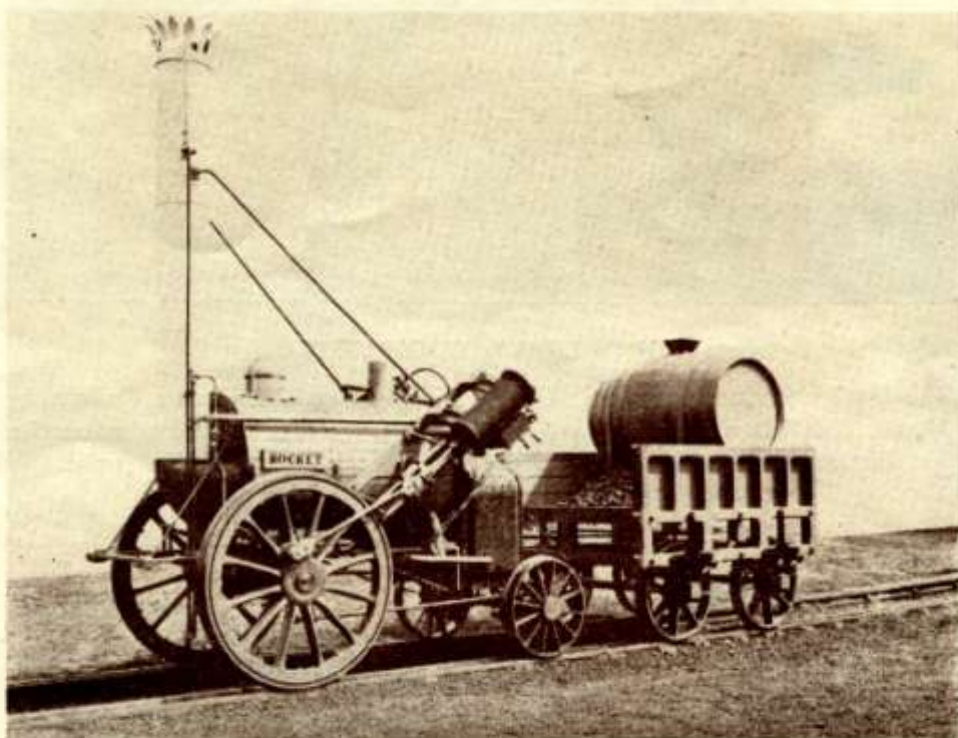
## RAILWAY EXHIBITION

(Organised by The British Railways Executive)

MARKET PLACE STATION

WEST BARS, CHESTERFIELD

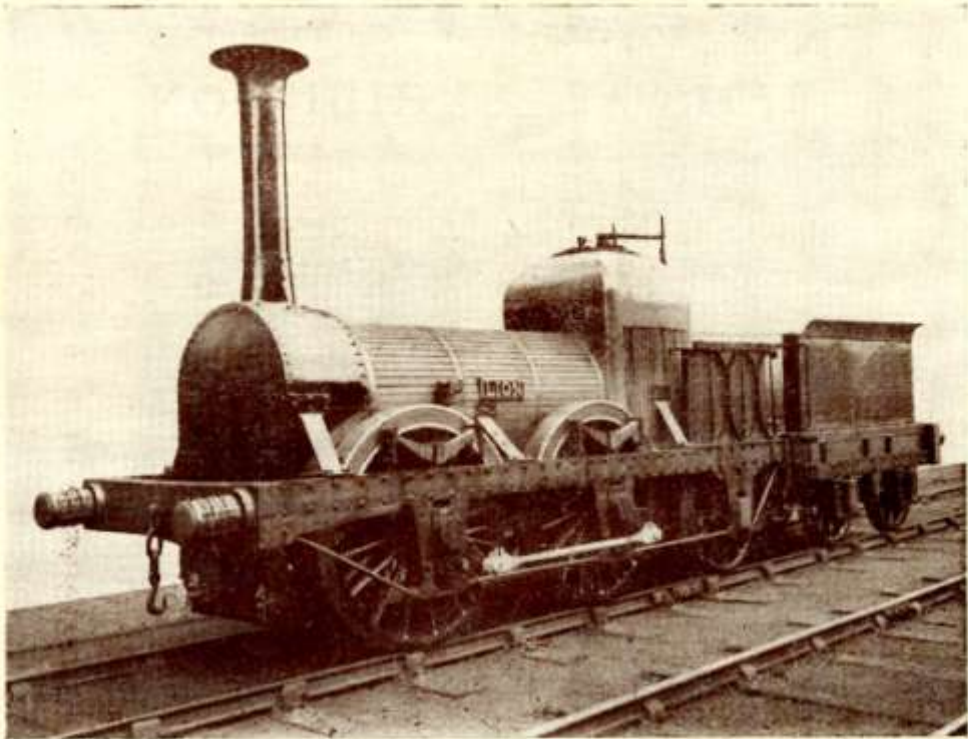
THURSDAY, 12th AUGUST to SUNDAY, 15th AUGUST, Inclusive.



### THE MODEL "ROCKET" LOCOMOTIVE

The original Locomotive was constructed by R. Stephenson & Co., in 1829 to compete for the £500 prize offered by the directors of the Liverpool and Manchester Railway to the makers of the most successful locomotive competing at the trial to be held at Rainhill in October of that year.





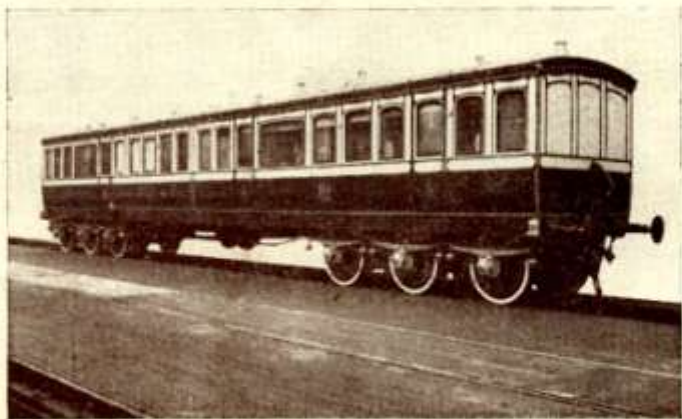
### THE "LION" LOCOMOTIVE

This 0-4-2 Locomotive was built for the Liverpool and Manchester Railway by Messrs. Tod Kitson and Laird, of Leeds, in 1838. Its four coupled wheels had a diameter of 5ft. and its cylinders were of 11in. diameter and 20in. stroke.

### QUEEN VICTORIA'S SALOON

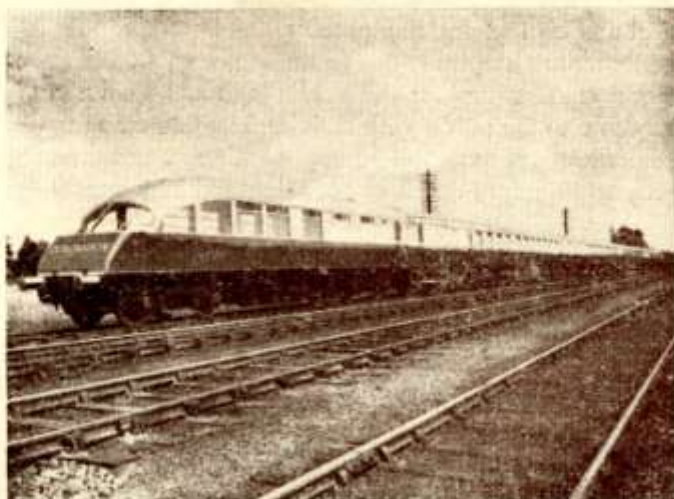
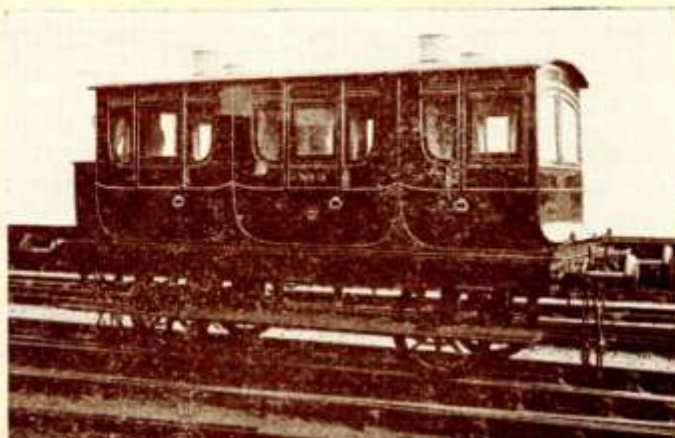
Built 1869 at the L.N.W.R. Wolverton Works as two separate saloons.

In 1895 the two bodies were joined together to make the existing saloon—60 ft. long and 8 ft. wide.



### **QUEEN ADELAIDE'S SALOON COACH**

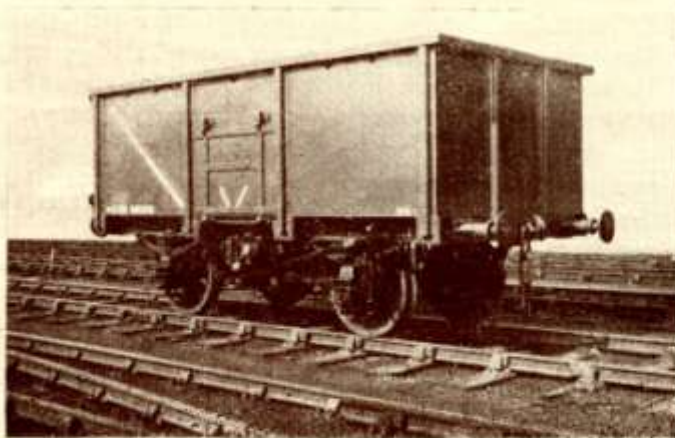
Constructed by the London and Birmingham Railway in 1842. The body was built by a well known builder in Gough Street, London, and the underframe was built in the Company's shops at Euston.



"Coronation" stream-lined train of the former L.N.E.R., showing beaver-tail observation coach.

### **MODERN MINERAL WAGON**

Built at Derby Carriage and Wagon Works in 1946. 16 ton steel Mineral Wagon.





## *British Railways Pay Tribute!*

To select any representative collection of exhibits which would adequately illustrate what we owe to the versatility and imagination of George Stephenson would be an almost impossible task. He was possessed of such boundless energy that his influence can be detected in practically every sphere of early railway development.

In spite of this, British Railways gladly availed themselves of the opportunity extended by the Chesterfield Town Council to participate in the centenary which has been organised to commemorate his death, and to add their tribute to the general demonstration of respect, which recollection of this great national figure always inspires in the hearts of railwaymen, everywhere.

The British Railways' section of the exhibition falls into two broad divisions. The first is historical and contains various exhibits connected either directly with George Stephenson or with early railways. The second is composed of modern examples of railway, mechanical and civil engineering practice.

The fact that the latter is not more extensive is due to the centenary falling at a time of peak demand for passenger railway travel and British Railways have had to reconcile the duty which they owe to the public with their desire to do credit to the occasion. Examples of modern locomotives and rolling stock have, however, been included and there is plenty to be seen which is of both technical and general interest.

In the historical section is included a full scale model of the "Rocket," together with other old locomotives and two special royal coaches, one used by H.M. Queen Adelaide and one by H.M. Queen Victoria. A large number of very interesting original documents, many signed by George Stephenson, and old photographs are also being exhibited, together with a number of items from the Railway Museum at York.

Modern Railway exhibits include a "Patriot" class express passenger locomotive, named in honour of Stephenson, a Class B.1 locomotive of the type which daily hauls the "Master Cutler" and "The South Yorkshireman" expresses, and examples of modern coaches. The streamlined observation car of the pre-war "Coronation" express, a travelling post office and signalling instruction and exhibition vans are also included, as are examples of present day freight rolling stock. In addition there are models and many photographs, showing what has been achieved since Stephenson pioneered his early railways.

Among the locomotive models is one, measuring 5ft. 4ins. of the "Royal Scot" and two 4ft. 11in. models of the London and North Western locomotives "Coronation" and "Jubilee." A model of an early Liverpool and Manchester Railway passenger coach is also included.

In addition to the full scale model of the "Rocket," which weighed less than eight tons in full working order as compared with as much as 160 tons for a modern express engine, there is the "Lion" a locomotive built in 1838 for the Liverpool and Manchester Railway. One of S. W. Johnson's celebrated Midland Railway



'single' locomotives, No. 118, is also on view, as is one of the Great Central Railway 'Director' class.

Copies of letters written by George and Robert Stephenson, in 1828 and 1829, relating to the 'Liverpool and Manchester Rail Road' are included among the documentary records. Memories of George Stephenson's bitter battle with the insatiable Chat Moss, in the building of that railway, will be stirred by an engraved full length portrait of him, by F. Atkinson, after John Lucas, in which the famous engineering hazard features prominently in the background.

Any introduction to an exhibition staged to commemorate George Stephenson would be incomplete if it omitted to recall something of the conditions under which early railways were pioneered. In reading through the history of those times there are phrases which catch the eye. For instance "in the building of the London and Birmingham Railway, Robert Stephenson, George Stephenson's son, walked the distance between London and Birmingham twenty-three times."

There are scores of instances in which boards of directors "met together with gloomy faces, much concerned at the mounting cost of building the line and the apparently insurmountable engineering difficulties which had been encountered." Time and again shareholders reached decisions to abandon projects and cut losses, only to be exhorted by their engineers to grant a little more time.

Such an instance arose when George Stephenson was striving eighteen hours a day to build his embankment across Chat Moss. The sponsors of the Liverpool and Manchester Railway decided that he had taken on an impossible task yet, within six months of their decision to give up the attempt, the first train, carrying those same directors and their wives and families, safely crossed the morass on which the embankment had been finally built. All the stories which are told give the same picture, that of ceaseless endeavour, often in the face of seemingly bitter failure.

Men like George Stephenson had not only to prospect and survey the lines they built, they had also in many cases to design and make every piece of equipment used to construct it. When the tunnels had been driven, the bridges built and the marshland conquered, the locomotives, rolling stock, track, and signalling installations, where employed, had to be devised.

It was no age of specialists. George Stephenson was one who combined all functions in himself, and moreover, he had to be the driving force, to inspire others with the confidence he felt in the soundness of his own ideas, without which he could not have achieved success.

Sixty-seven years ago thirty-thousand people assembled in Chesterfield to commemorate the birth of George Stephenson. This second centenary is an even more solemn occasion. We, to-day, can see even more clearly the greatness which he justly earned. His principal characteristics were undefeatable courage, unshakable faith and an infinite capacity for work. These qualities, added to his skill, made him a true pioneer; one who will be regarded with admiration and respect for many generations to come, by all who have studied his life.



# *Exhibition of Stephenson Relics and Documents*

at the Central Library, Stephenson Memorial Hall, Chesterfield

August 12th to August 28th, 1948

By G. R. MICKLEWRIGHT, A.L.A., Borough Librarian, Chesterfield

Through the co-operation of the Science Museum, the Institution of Mechanical Engineers and many other Institutions, together with the loan of items from private individuals, it has been possible for the Chesterfield Library and Museum Committee to present, in this Exhibition, a representative collection of documents, illustrations, plans and other material, including many of the personal possessions of George Stephenson. The Library and Museum Committee is also forming a "Stephenson Collection" in readiness for the proposed new Central Library, Art Gallery and Museum, and many of the items in this collection will be exhibited. George Stephenson's association with Chesterfield and District (1837-1848) is naturally stressed, especially the founding of the Clay Cross Co., Ltd., in 1837, his residence at Tpton House (1838-1848), his association with Frederick Swanwick (who moved to Whittington in 1837) and his burial in Trinity Church (1848).

By kind permission of the Director of the **SCIENCE MUSEUM**, the exhibits will include :—

- (1) **Personal possessions** of George Stephenson presented to the Science Museum by G. A. Mosse:—
  1. Gold watch. 2. Silver repeater watches. 3. Gold seal. 4. Measuring tape. 5. Ivory four-fold foot rule. 6. Case of drawing instruments. 7. Clinometer used by Stephenson for taking levels on his first railways. 8. Two lancets in silver case. 9. Two snuff boxes. 10. Magnifying glass. 11. Printed calico bag (made from a dress of his first wife) containing 2 hair brushes, shaving brush, and pin cushion. 12. Frame containing hair of George Stephenson. 13. A. L. G. Stephenson to Ellen Gregory, who became his third wife.
- (2) **Stephenson Lamp.** This is the final form of Stephenson lamp known as the "Geordie." Air is supplied through fine holes in the bottom ring of the cage, and the glass chimney is surmounted by a perforated copper cap. Wire gauze was added to protect the chimney. The reservoir is filled from an external spout and a screw lock is fitted.
- (3) **Drawing of George Stephenson's Killingworth Locomotive, 1815** (Scale 1: 24). This is believed to be the earliest known drawing of a Stephenson locomotive. It is supposed to have been made by George Stephenson himself, and it was given by him to William Howe, with whose descendants it remained until it was acquired by the Museum.
- (4) **Model of the "Rocket" Locomotive, 1829. Made by Messrs. Stuart Turner, Ltd., from drawings prepared in the Museum.** This model,



partly in section, represents the famous locomotive "Rocket" as originally built for the Rainhill trials in 1829.

- (5) **Rainhill Trials and the Rocket Locomotive.** Copy of the **Liverpool Mercury** for 1st May, 1829, which contains the following advertisement:

**"To Engineers and Iron Founders.** The Directors of the Liverpool and Manchester Railway hereby offer a Premium of £500 (over and above the cost price) for a Locomotive Engine, which shall be a decided improvement on any hitherto constructed, subject to certain stipulations and conditions, a copy of which may be had at the Railway Office, or will be forwarded, as may be directed, on application for the same, if by letter, post paid.

HENRY BOOTH, *Treasurer,*

**Railway Office, Liverpool, 25th April, 1829."**

- (6) **Two Invitation Tickets for Opening Ceremony** of the Liverpool and Manchester Railway on 15th September, 1830. The lilac card entitled its possessor to a seat in the first train consisting of the "Northumbrian" locomotive, driven by G. Stephenson with Mr. Moss, the director in charge, with the state carriage, band, etc. The yellow ticket was for the third train with the "North Star" engine driven by Mr. R. Stephenson, senior. Originally belonged to Charles Lawrence.

**THE INSTITUTION OF CIVIL ENGINEERS** has lent, in addition to other items, the original "Chat Moss" portrait of Stephenson by John Lucas (see frontispiece). This painting was the result of a request by Robert Stephenson to John Lucas to paint the full length of his father, in which he is represented standing upon Chat Moss, showing the line he constructed between Liverpool and Manchester.

The following note from Robert Stephenson's Secretary testifies the approval it won.

"Dear Sir,—I am requested by Mr. Robert Stephenson to inform you he has no objection to your portrait of his father being sent to the Institute for the *Conversazione* to-night. I am also desired to forward you the enclosed cheque, and to express Mr. Robert Stephenson's unqualified approval of the picture as a likeness and as a work of art, and his sense of obligation to you for the infinite pains you have taken with it."

George Stephenson died the year following the completion of the portrait.

To the **INSTITUTION OF MECHANICAL ENGINEERS** (founded in 1837 by George Stephenson) and its Librarian, Mr. A. R. Stock, F.L.A., we are greatly indebted for assistance in many ways including the loan of a very large collection of Stephenson relics and documents. These are too numerous to list but include the following:—



1. **Longridge collection** of Nine Original Letters from George Stephenson to Michael Longridge, of Bedlington Iron Works, near Morpeth.

All these letters are of railway interest, all are signed by George Stephenson, and three are in his own handwriting (and spelling). They afford striking glimpses of the writer's character.

2. **Thompson collection** of Original Letters from George Stephenson to R. W. Brandling and others.

R. W. Brandling, of Gosforth Hall, was an early and influential supporter of George Stephenson, who received his encouragement when it was most needed. Three letters to Brandling are all on the subject of railway planning. Colonel Thompson obtained them from Miss Clare M. Brandling.

3. **Thompson Collection** of Letters respecting the Invention of the Safety Lamp.

These letters were obtained by Colonel Thompson from Miss Clare M. Brandling, granddaughter of R. W. Brandling, to whom most of them are addressed. He struggled for the recognition of George Stephenson's invention of the Safety Lamp. They are from various writers, including men at Killingworth Colliery, and are dated 1816-17.

4. **Thompson Collection** of George Stephenson's Agreements, Letters, Portraits, etc.

In this collection we find :

" Estimate, by John Dixon, of the Expense of making a Road across Chat Moss by Piling and Planking."

" Estimate (signed by George Stephenson) of making a railway from Rain Hill to near Hurst Hall, being a part of the Line of the Liverpool and Manchester Railway authorized by Parliament in 1826."

Sixteen page Pamphlet "**A Description of the Safety Lamp**, invented by George Stephenson, and now in use in Killingworth Colliery, to which is added, an Account of the Lamp constructed by Sir Humphrey Davy, with Engravings. LONDON : Printed for Baldwin, Cradock and Joy : Archibald Constable and Co., Edinburgh ; and E. Charnley, Newcastle. 1817."

The pamphlet is complete with the four engraved plates. It is very rare.

**Will of George Stephenson.** Dated 3 January, 1839. This three-page ink-written will is signed "Geo. Stephenson" at the bottom of pp. 1 and 2 and at the end of the will on p. 3 opposite the red wax seal.

**Will of George Stephenson.** Dated 15 January, 1848. This nineteen-page ink-written will is signed "Geo. Stephenson" at the bottom of every page



from 1 to 18 inclusive and at the end of the will on p. 19. There is also a photographic copy of his last will, dated 4 April, 1848.

5. **Original Oil Painting**, of George Stephenson seated, with dividers in his right hand and plan of the Weaver Viaduct, by H. P. Briggs, R.A. (reproduced on Fig. 1, p. 47).

The **CLAY CROSS COMPANY LIMITED**, founded in 1837 by George Stephenson has, through the courtesy of Col. H. H. Jackson, lent all the original documents in its possession, including:—

1. Bound Ledger on Proceedings of the Proprietors at Clay Cross Collieries at their meetings (1846-1854).
2. Bound Ledger—Balance Sheet of George Stephenson and Company, 1842-1853.
3. Single Sheet of Summary of Transfers made from time to time of shares or interest in the Clay Cross Company, 1842-1871.
4. Three Bill Heads relating to George Stephenson and Company Limited.
5. Bill to George Stephenson and Company for conducting cargoes of coal up the River Thames to Windsor.

We are very grateful indeed, to **MRS. M. FISHWICK**, of Ulverston for the interest shown in the Exhibition. Her great-grandfather was George Stephenson's brother, John, who was killed (at the Newcastle works) when quite young. George Stephenson took his widow and large family to live with him, giving the younger ones a good education. Mrs. Fishwick's father is the oldest member of the Stephenson family living to-day. She has kindly lent us the grandfather clock and dining table which belonged to George Stephenson, together with a bound volume of original drawings of Stephenson's Inventions. Mrs. Fishwick has also promised a fine copy of the Chat Moss Portrait which is to be hung permanently in the Stephenson Memorial Hall.

The **NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS** has consented to lend the George Stephenson "Geordie" Lamp. This is built on the pattern of the final lamp made by George Stephenson of Killingworth. He first experimented in 1815 with candles and oil lamps which had perforated metal plate surrounding the flame and air inlet tubes through the oil vessel, and introduced his safety lamp to the pit in November and December, 1815. Davy's lamp was first tried in the pit, in the presence of Mr. J. Buddle and the Rev. J. Hodgson in 1816. Davy's gauze had advantages over Stephenson's perforated plate, and the substitution of a gauze for the perforated plate led to what we know as the Stephenson lamp.

This particular lamp was presented to Tristram (Kit) Heppell of West Moor Colliery (grandfather of the donor) by George Stephenson in 1818 as a mark of



friendship and for assisting in the testing of the safety lamp. It was used by Kit Heppell until 1863, after which it was used by his son John till 1887.

From **ALDERMAN E. D. SWANWICK** of Old Whittington we have received several letters written by George Stephenson to Joseph Swanwick, the most interesting being a letter dated "Liverpool, March 30th 1829":—

"Dear Swanwick—

If you intend your son Frederick to be bound an apprentice to me there is now an opening for him to come into my house—I think I have told you my terms before—You will oblige me by an early answer . . ."

Attached to the letter is a statement dated January 29th, 1830.

"By Board of F. Swanwick for 26 weeks at 15/- per week, £19 10s. 0d.

Another most interesting document is what is apparently an eye witness account of the Rainhill Trials written by Frederick Swanwick (then aged 19) which describes the testing of the "Rocket":—

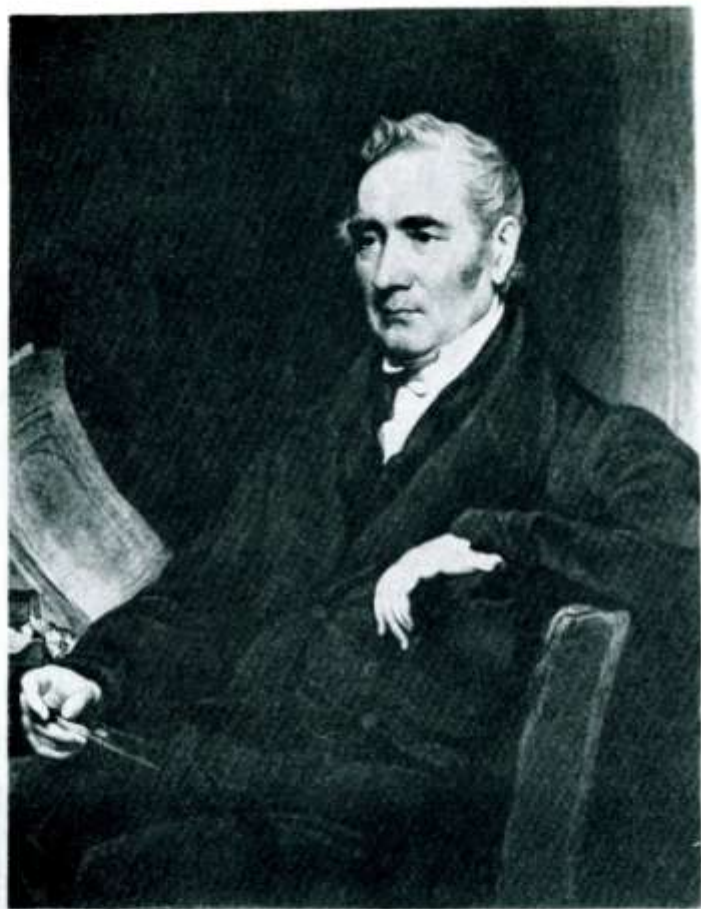
"The Rocket (Mr. Stephenson's Engine) travelled 70 miles with a load of 12 tons 15 cwt. attached to it in 6 hours 2 min., being at the average rate of about 12 miles per hour and its rate of speed was constantly progressive.

"The quantity of coal consumed in this journey was about 9 cwt. The speed which it at one time attained was about 18 miles per hour. When travelling without a load the average rate of speed was 30 miles per hour, which it maintained for a distance of 7 miles without being supplied either with coke or with water. Its maximum rate of speed during this trip was 32 miles per hour. The Rocket has since performed the following tasks. With a load of 33 tons attached to it it travelled 9 miles at the rate of  $13\frac{1}{2}$  miles an hour. With a load of  $37\frac{1}{2}$  tons it travelled 3 miles at the rate of  $13\frac{1}{2}$  miles per hour. With a load of 42 tons it travelled 3 miles at the rate of 14 miles an hour. It will thus be seen that the more work was given the engine to do, the more she did (or rather that as parts became heated, and the activities of the rubbing surfaces reduced by their motion one upon another the more powerful she became and the more of that power became available for the draught of an attached load).

"The Rocket ascended the Inclined plane  $1\frac{1}{2}$  miles long and having an inclination of one in 96 with a load of 11 tons in 5-min. 35-sec. i.e. at the rate of  $16\frac{1}{2}$  miles per hour. With 16 tons attached to it, performed the same distance in 7-min. 10-sec. being at the rate of  $12\frac{1}{2}$  miles per hour."

#### FINAL NOTE

Owing to the early preparation of this account for publication in the Brochure, we have not been able to refer to all the items to be shown in the Exhibition nor have we been able to express our thanks to other individuals who will, no doubt, lend items for the Exhibition.



*George Stephenson  
Engineer*

Fig. 1. Portrait of George Stephenson

From an engraving by C. Turner, A.R.A., 1838, after a painting by  
H. P. Briggs, R.A.

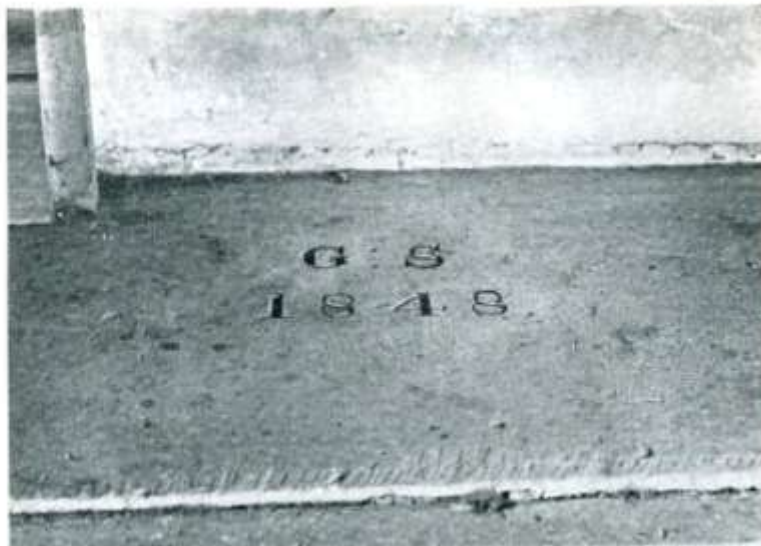


Fig. 2. George Stephenson's Tomb



Fig. 3. Stephenson Mural Tablet





Fig. 4. Stephenson's Birthplace, Wylam-on-Tyne



Fig. 5. Birthplace of The Institution of Mechanical Engineers

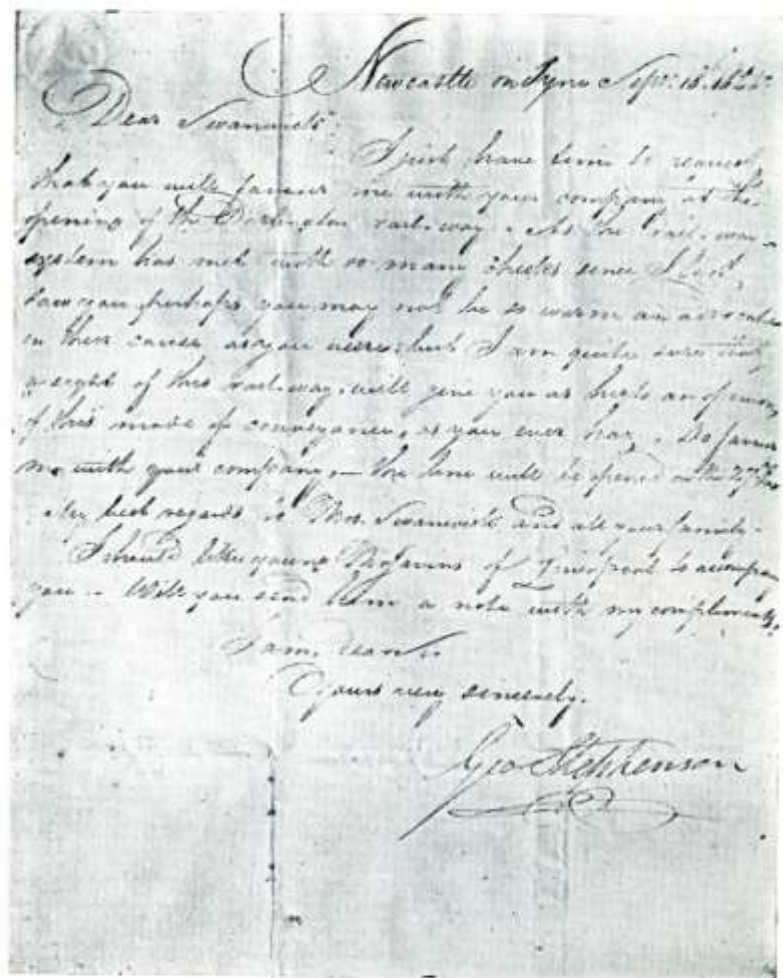


Fig. 6. The Swanwick Letter







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in Great Britain by Broomhead  
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