

GEORGE STEPHENSON'S PRESIDENTIAL ADDRESS  
TO THE INSTITUTION OF MECHANICAL ENGINEERS

27 January 1847

(Extracted from the First Minute Book of the Institution)

Mr. Stephenson at the request of Mr. McConnell took his seat as Chairman of the meeting - After the applause had subsided he briefly returned thanks. He said he most heartily thanked them for the compliment they had paid him, and he could assure them it would be very gratifying to him to reflect, that in advancing towards his declining years, he had been called upon to meet and preside over so much of the rising talent of the Country as he then saw around him

He felt satisfied that by uniting their talent together they would be in a condition to compete with any other nation in the world, but he must say, that unless the talent of England was concentrated it was not unlikely some of the Continental talented men might take part of the business of this Country (hear hear). He had lately been on the Continent, and when he saw locomotive engines building there in a superior manner, he could not but consider it would require all the talent in this Country to keep them in check. They must not however be disheartend, they knew what they had already done, and that they were capable with persevereance to do still more - They all knew the arduous life he had had to go through; he served no apprenticeship to mechanics it was merely the result of a turn of mind which he had had and which

the endeavoured to direct in the proper channel. Altho he had this turn of mind he could not at first get any one to give him a trial; the applied to a Manufactory of Steam Engines at Newcastle to take him into their employ but no notice was taken of his application, he then intended to go to America where he imagined he might have a chance of getting into some Manufactory of Steam Engines, two friends engaged to go to America with him, one of them a farmers son the other an able bodied labouring man. The arrangement was that if he got forward with engineering he was to be their Masters but if he failed in that they were then to try farming and if they got on in that business the young farmer was to be master this arrangement got broken up by his two friends getting married and their wives prevented their going. Just at this time a large Colliery became inundated with water and a large engine was erected for the purpose of extracting the water at the time the Engine was erecting he made some calculations as to the work the Engine would have to do he made out that the pressure on the piston would have to be 8lb per square inch this being an atmospheric engine few Engines had ever been known to work so high on that principle and he ventured to state to some of his friends that he believed the engine would not do the work. This statement got to the ears of his masters and the engineers who were erecting the engine which nearly cost him his situation he being at the time working for 19/ per week however to this he had two small rooms and his firing found him. Time went on and the engine got erected and strange to say the engine could not extract the water nearer than 30 yards within the bottom of the

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It he then said to the same friends who he had told before that the engine would not draw the water that he could make it extract the water to the bottom of the pit - after trying the engines for some weeks the masters wrote for him to appear at the Office to explain what he had been saying about the engine, he was however afraid to go to the masters as he thought he was only going to be reprimanded however his friend who was an overlooker advised him to go and he would accompany him. The Office was about two miles distant and his friend went with him there and when they arrived and the master was told by the overlooker that he had brought Stephenson down the master said put him into the Kitchen until I get time to speak to him and when the master came into the Kitchen he asked him if he had said that he could make that engine draw out the water His reply was that he had said so and do you mean to say continued the master you can do it? his Mr S answer was I do and how long will you be in doing it again asked the master. He replied 3 days and then followed what do you mean to do He Mr S stated some of the changes he meant to make of the engine but not all - After some consideration from the master he said "Well George we mean to try you and you must go and commence immediately with the alterations It was then Sunday and he Mr Stephenson wished to defer it until the Monday morning but the order was he must start immediately, he then left his master and got such assistance as he thought was necessary Blacksmiths were the principal assistants that he wanted as a considerable alteration had to be made in the working gear. He himself/<sup>stopt</sup> at the engine night and day from the Sunday until the Wednesday and on that evening about 5 P M he had the

ready to commence working. There were great numbers of people to see the engine commence some from curiosity and some to quiz were 100 yards of water in the pit when the Engine commenced working. At first there was very little load upon the engine for some time but she got off in grand style moving up and down as if she had nothing to do. At 10 o'clock the next morning there was a man went to the bottom of the pit. This was the commencing of his Engineering career and on Saturday some of the other masters came to see what kind of a chap Mr Stephenson was. He then had to leave off his other employ and attend to the working of this engine. The pit was sunk 30 yards deeper and the Engine continued to draw the water with ease and after putting to the bottom of the feeders cast iron casings was put into the shaft which prevented the water coming in and after that the Engine was not wanted - Mr Stephenson then stated to the meeting the alterations he made in the engine which increased its power so much - This same engine had been formerly erected by Smeaton (who was then the leading engineer of the day) in another situation and he Smeaton laid down rules for the size of the jet pipe in proportion to the diameter of the cylinder also the height of the cistern was given for holding the water to pass through the jet pipe for condensing the steam in the cylinder. Now he Mr Stephenson broke through Smeatons rules and made the jet pipe double the area of Smeatons dimensions he also raised the cistern to a greater elevation than what was required by Smeatons instructions - Before he Mr Stephenson altered the engine he saw that the condensation of the steam in the cylinder was too slow which he saw

the movement of the beam although a mile from the place when he his calculations - After the engine was altered it took little more than half the water to condense the steam in the cylinder that formerly did the increased quantity of water that was thrown into the cylinder by the increased height of the cystem and the enlargement of the jet pipe was then considerably more than double the quantity thrown in before the alterations and of course the steam was condensed as quickly and as completely as in a condenser and he had no doubt that, that engine worked more completely than any atmospheric Engine that was ever erected. He thought it was necessary to make this explanation of the Engine as they were all mechanics present

His next step in engineering was by erecting a winding engine at the same pit for drawing the coals and here he begged to be allowed to give the young mechanic a little advice let him first learn the laws of mechanics and never attempt to make a pound weigh more than a pound and as no man ever lived or ever will live who could make it do and he would now venture to give them a little further advice. They were all aware that many patents had been taken out for the rotary engine. Now no sound mechanic can make up his mind that such a contrivance can be of any use - He was quite aware that it was the opinion of many that there was a loss of power in the crank passing the centres but it was not so it was very true there was no power given the engine upon the centres but there was an extra power given at half stroke which makes up for that defect - At half stroke the connecting rod was in a position to give out more power to the

crank pin than was actually given out from the piston as the beam at the connecting rod end becomes in some degree shorter than the piston beam end - This might be found by taking the radius from the centre of the beam passing through the centre of the connecting rod which gives the leverage from the beam Then let the same radius line follow up to the beam which will cut a piece of the beam and which gives out the additional power. As he had stated he would again remind them that perseverance was particularly required in getting on in Engineering and they must make up their minds to throw all difficulties over if they were right in their Mechanical notions they would be sure in the end to succeed - They must all bear in mind that he himself had no one to assist him and when he went to Parliament with his little tin model of his locomotive engine and stated to the Committee that he would make an engine to go 10 or 15 Miles an hour he was at that time taken by some to be a foreigner and others thought him mad - All these observations he heard and saw how he was quized this did not stop him from going on and they all now know what had been done by that perseverance - It might be necessary for him to make a few more remarks on his engineering career Before he erected any locomotive Engine he had erected several Engines underground in the mines and this lead him to make a remark upon one of the boldest turns that had ever occurred to him during his life when judgment perseverance and courage were called into action in a few minutes - In one of the mines where he had been erecting Steam engines the coals had caught fire for more than 300 yards in one of the passages under ground when the air was leading to the Shaft the alarm was so great that the

whole of the miners got out of the pit as fast as they could. He knew the mines so well that he was certain in a very short time the whole concern would have been destroyed unless the fire could be extinguished. He stated to the whole of the miners present that if any man would go with him he would go to a certain place in the mine nearly a mile from the shaft where he would put up a partition with Bricks and Lime so as to prevent the air going to feed the combustion. One man spoke up and said if "Stephenson goes I will go with him" and off they started and on their way they had to trap the fire very nearly but in a different channel where the fire was blowing down the Stone and roaring off like the report of cannons - They succeeded in getting to the place the partition was put up the fire extinguished and the person who went with Stephenson was a working man but after that time got an overlookers situation and he Stephenson got a horse to ride upon and his salary increased to one hundred pounds per year and 2 additional rooms added to his cottage. He stated that he merely made these observations for the encouragement of the young Mechanic and to have much pleasure in meeting the society and he begged to assure them that they should have his best exertions to encourage the Society (Loud and continued applause)