

# 3A Thomas Lovett

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Thomas Lovett came from Chirk to take a lease on the Snailbeach Mine in 1782. Previously it had been worked on a small scale. Lovett, who understood modern business methods, gathered a group of shareholders to raise £30,000 to work the mine in a modern efficient way.

A Thomas Lovett was chief agent at Chirk Castle after 1750 and wrote about modernising farms and their accounting systems to make them more profitable. It is most probable that it is either the same person as the Thomas Lovett who came to Snailbeach, or that the Snailbeach Thomas Lovett is his son. A report of his work follows [*Quotations from Jones, H. (1985), Accounting, Costing and Cost Estimation: Welsh Industry 1700-1830 (Cardiff: University of Wales)*].

*Lovett prepared model accounts for a 400-acre farm. He starts by calculating the necessary capital, which he reckons as £1279.14.0. "Now I want to know what profits may be reasonably expected from the circulation of this large capital in the business of Farming..." Just like a modern capitalist he expects profit from the circulation of capital in production and, to confirm this, in calculating his profit Lovett deducts "[w]ear and tear in the implements of husbandry . . . and the decay in dairy utensils ...". Lovett then deducts "[t]he interest on his neat Stock and neat Cash laid out . . . after the rate of £10 per cent" to calculate his residual income. Like a modern capitalist he "distinguishes . . . between revenue and capital and recognises that certain types of 'capital' wear out or fall by the wayside and have to be replaced ... to maintain his starting capital intact..."*

*Our Thomas Lovett came from Chirk so the account above applies to him or his son, In the following tale it is assumed that this is the same man.*

*The technical section about steam engines is best used in the classroom with internet access to the working diagram of a steam engine.*

## Summary of Thomas Lovett's achievements

- 1782 takes a 21 year lease on Snailbeach Mine
- 1783 forms a partnership with 7 others with a capital of £30,000
- Start Old Engine Shaft (George's Shaft)
- 1784 leased land near Pontesbury for the Nag's Head Coal mine
- Builds a lead smelter at Pontesbury
- Digs a horizontal tunnel (Adit) over a kilometre long to drain the mine
- Builds a water wheel to pump from lowest parts of the mine
- Puts in the first steam operated pumping engine

## The Mine before 1782

The Inventory of 1770 (Document 4R) shows the assets of the mine prior to the formation of the company. There is virtually nothing of any value beyond an 'engine' and a few horses. Thomas Lovett would bring the industrial revolution to Snailbeach.

## Thomas Lovett's Tale

I may say without boasting that I am the man responsible for creating at Snailbeach the finest lead mine in the land. I did not arrive with any great knowledge of mining: I had to employ men who understood this science. My expertise, and the reason for the mine's prosperity, lay in my understanding of business and of the importance of capital. I know how to use money and how to make money.

I came from Chirk Castle, where I learned about making money from farming. It was my job to make money from the Chirk Castle Estate. Look at your assets. In the case of the farm it is the land, the animals, the farm buildings and so on. Some of these assets will remain. A field is always a field. But the horse grows old and dies. The barn loses its roof. There are constant expenses. Now, my accounting method ensures that the capital is never drained away. We buy a new horse, renew the barn roof, and all these things go into the working expenses of the farm, so that at the end of a period the capital assets remain as they were at the start, or become even greater. They must never be allowed to run down.

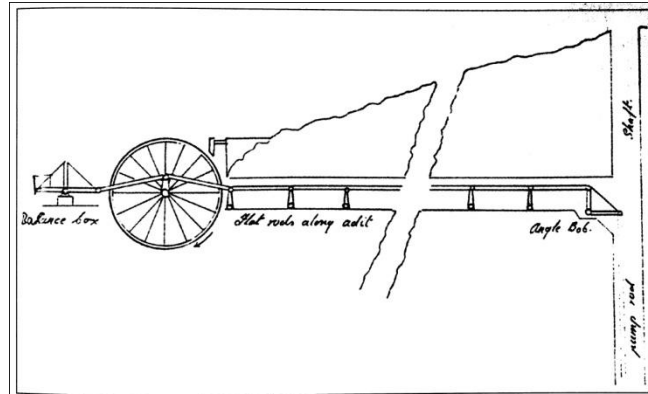
Now, we come to the mine. First we establish what working capital will be needed to start the enterprise. Look at the old inventory from 1769. The biggest item is machinery – an engine to wind the buckets, called kibbles, up the shaft. Then there is the value of the horses. A good horse is worth ten guineas, ten pound 50 as you would say, but an old one is only £2. They didn't spend any money, and they didn't have any. But I reckoned this is a good mine, and if we are to make a profit we have to work it properly. I set up a company with shareholders. There were ten shareholders, with 16 shares, and I had 2 ½ of the shares. We needed £30,000 to get this moving. What's more, I had a 21 year lease. That means that I have permission to mine for just 21 years. In that time everyone needed to get their money back, and make a profit. No-one would invest if they didn't think they would get at least 10% back every year, and I thought we could make more than this. But to make money, you need to invest.

First there was this shaft to be made. Everything near the surface had been taken. We didn't go very far before we struck ore and started getting a return. But then we need machinery, and we needed coal to drive it. We knew there was coal at Pontesford, so we opened a coal mine to get it. More expense, but we keep the costs in house.

The holes in the ground, the shafts, which cost a fortune to dig, are not listed on old accounts. But these are the way we get at the ore. Put them in the calculation. And, when you do the expenses, remember that these shafts and tunnels need to be extended all the time or you will soon run out of ore. You have to look ahead, plan ahead, and make sure you have enough money to keep expanding. This isn't like farming. You can't come back to the same ground again and again and plant another crop. There isn't one. It's all gone. Mining is a robber economy. Once you have taken the ore you have to move on, either extending your mine, or closing it whilst you're still in profit and moving on somewhere else. No mine is going to last forever. With farming you put the value back into your farm every year. The farm will always have a value. If it makes just 5% a year, you still have the farm after a century. But in mining you take the lead, and when it's gone, you have nothing. So your profit needs to be bigger, because the risk is bigger, and you don't know when there will be nothing left.

What we found here is that the Snailbeach vein is very rich, here in the Mytton Flags. But try to follow it into the hard quartzites below, which are at the top of the ridge to the east of here, and you find nothing at all. It's as if the quartzite repels the lead and didn't allow it to form here. So it's pointless going further up the valley. All we could do was make the mine deeper. But then we had to drain the mine. Now, look down the valley. The ground slopes down to the Hope Brook. If we made a horizontal tunnel here we would be able to drain the mine. It cost a fortune to make the tunnel we call the Wagbeach Adit over a kilometre long.

When we finished the tunnel we found we needed to go even deeper to find lead. So, to pump the water up to the level of the Wagbeach Adit, we installed a water wheel. The wheel moved a rod, over a kilometre long, backwards and forwards in the Adit. Then, when it came to the shaft, an angle bob turns the backwards and forwards motion into an up and down movement. With this we could drain the bottom of the mine, and bring the water up to flow out through the Adit.



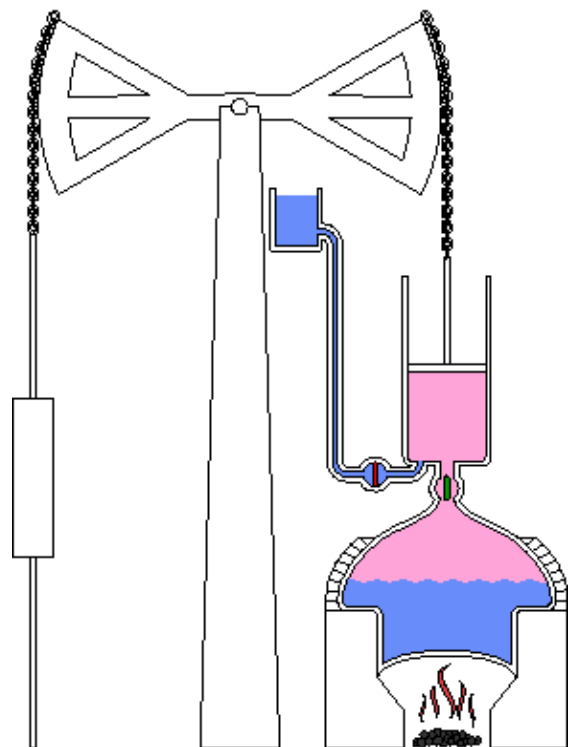
Water Wheel and Pumping Rods on Wagbeach Adit

So now we know where to look. There is one good vein, the richest vein of lead in the land. But it is only a kilometre long. After we have worked this, we have to go down. There isn't any lead left up here. The Romans probably took most of it, and they left this great pig of lead, the weight of a man, just to show how successful they had been. Then there were other people, scratching away at the surface and trying to get what they could. But we have to go deep. Down below here, down below the level of the Hope Valley, and down again to sea level and beyond.

Can we do it? We know we can dig down, but can we get the water out of the mine? You can't suck the water out. What you have to do is push it out from the bottom of the mine using a pump. So you need a system of rods going right to the bottom of the mine to pump the water. And we need something to move the rods up and down to make the pump work. Eventually the water wheel couldn't cope. We had to buy a steam pumping engine.

### How a pumping engine works

Let's have a look at the pumping engine. Thomas Newcomen invented the first practical steam engine for draining mines in 1712. A fire heats the water and makes steam. When the pressure is high enough a valve



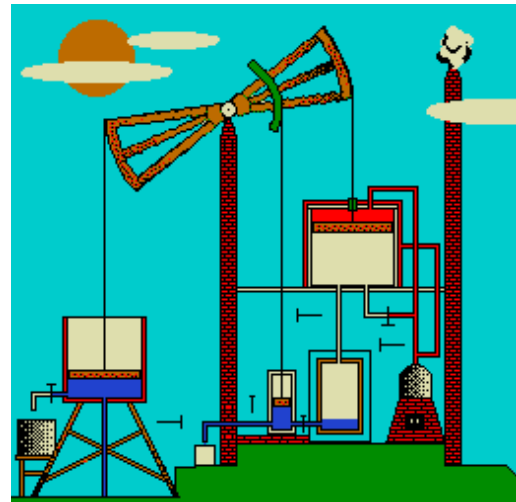
See this engine working at [http://en.wikipedia.org/wiki/Newcomen\\_engine](http://en.wikipedia.org/wiki/Newcomen_engine)

opens, and the steam enters the cylinder, and pushes the piston up. The valve then shuts, and we need to make the piston come down again. Here is the brilliance of the invention. Another valve opens for a moment and lets some water into the cylinder. The steam quickly condenses, making a vacuum in the cylinder, and this pulls the piston down again. When it gets to the bottom, the process starts again. A good engine can run at 12 strokes a minute.

This engine was very good for draining coal mines, because they produced enough coal to power the engine. But it was very inefficient, so it wasn't much use here.

We used an improved engine designed by James Watt. He used a separate cylinder to condense the steam, so the main cylinder is always hot. This saved a lot of coal. It only uses a third of the coal of a Newcomen engine. The trouble was that Watt patented his design. He went into partnership with a man called Matthew Boulton. Boulton had an ironworks to produce most of the parts for the engine. But here is the clever bit. If you wanted to use a Watt engine, you had to pay royalties. And the royalties were based on the amount of coal you would save by using this new engine. This wasn't good for the industry, because Watt had patented his engine. No-one could improve it, no-one could copy it, and there wasn't anything better. Still, we had to have

one, so we paid up. But Watt's patent meant that steam engines couldn't be altered or improved for about 20 years, and that really set the industry back. You see, the real improvement we needed was an engine which could turn something round, like a water wheel does. And Watt's engine is only useful for pumping the mine. We're still using a horse gin to wind the kibbles or buckets of lead ore out of the mine.



See this engine working at [http://www.hollowellsteam.com/watt\\_anim.htm](http://www.hollowellsteam.com/watt_anim.htm)

### **Note on the Diagram of Watt's Engine**

The diagram of the working of the steam engine is correct, but the pump on the left hand side gives the impression that it sits at the top of the shaft and sucks water up a pipe. This doesn't work, because water cannot be raised more than a few metres in this way. The pumping engine has a long rod which goes all the way to the bottom of the mine. The pump at the bottom then pushes the water up a pipe to the top. When the Wagbeach Adit had been made water only had to be pumped to this level before it flowed out of the mine along the Adit. At first there was a water wheel to pump the mine. It was beside the outlet of the Wagbeach Adit, and was connected to a moving rod which ran all the way along the Adit, and then down to the bottom of the mine. The steam engine had to be bought when the water wheel was not powerful enough to drain the bottom of the mine.

Actually, they paid me a great compliment when they came and installed our engine. In 1797 they wrote to me, asking me to become the manager of the famous Minera Mine at Wrexham. I replied on 16 Feb. 1797. I explained that I was not a mining engineer, and could not accept their offer. My expertise is in finance, and I am fully occupied in exploiting the riches of the Snailbeach Mine. What I

didn't say was that as the major shareholder here at Snailbeach, I needed to look after this mine. However, I did suggest to them a good man who would be a suitable underground agent.

Back to Snailbeach Mine. I knew we needed coal. That is why the first thing I did after forming the Snailbeach Company was to get the rights to a supply of coal. We leased the Nag's Head Colliery at Pontesford, and that is where we built the smelter. So the lead ore was taken to Pontesford, and the wagons could bring coal back for the pumping engine at the mine. We were going to need a lot of coal, so the best thing to keep production costs under control was to mine the coal ourselves.

So there you have it. The finest lead mine in the country, producing up to 3,000 tons of lead every year. We started just at the right time. There was a war against France, and lead is what you shoot from a gun. Every shot needs lead, and this kept the price high. In some years we sold £120,000 worth of lead. My men were working flat out to satisfy the demand. The owner of the Land, the Marquis of Bath made a fortune. The shareholders made a great return on their money; more than 25% in a year. In all my time here we have never had to go back to the shareholders for more money. Everything has come out of our profits, and if the price of lead holds up, we have a wonderful future here at Snailbeach.

How would I like to be remembered? As the man who saw the opportunity at Snailbeach, and created the finest lead mine in the county. And, as the largest shareholder, I have been able to hand on to my children a most valuable asset which should provide them with an income for years to come.