

January 19

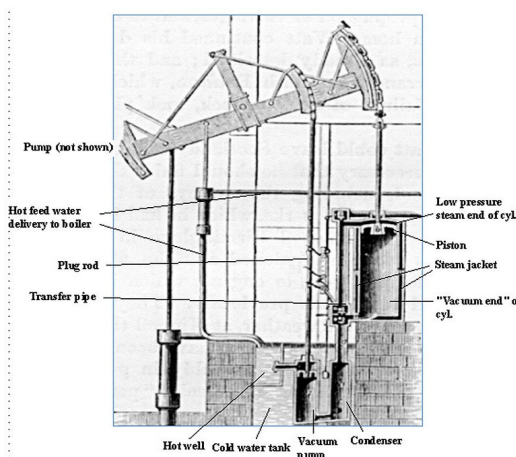
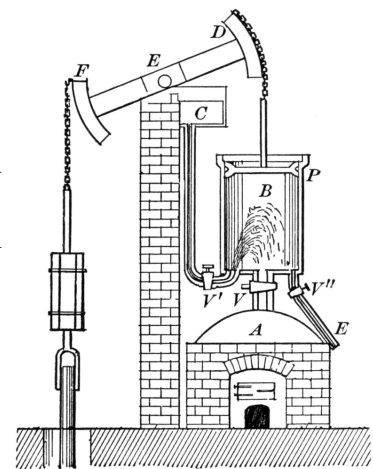
Memory Verse:

and they shall beat their swords into plowshares,  
and their spears into pruninghooks:  
nation shall not lift up a sword against nation,  
**neither shall they learn war any more.** Micah 4:3b

An invention to read about<sup>1</sup>

James Watt (1736-1819), engineer and inventor, was born on 19<sup>th</sup> January in Greenock in Scotland. As a child he was often ill with bad headaches that lasted for days. This meant that school was out of the question for him and his mother taught him at home to read, write and do basic maths. She had had a good education herself and must have seized the moments when young James was feeling better in order to help him.

James was keen to learn and he was soon reading everything he could. When he was feeling better he went to his father's workshops where he was able to learn how to use tools. When he grew up James worked at repairing mathematical instruments for the University of Glasgow. One day he was given a model of a one of Thomas Newcomen's steam engines to repair. You can see a diagram of one of these engine on the right. They were used all over the country for pumping water out of mines. The model worked well when James had repaired it but he realised that it could be improved. The cylinder "B" in the diagram had to be repeatedly heated and cooled in order to condense the steam into water.<sup>2</sup> James realised that if the steam could be condensed separately the machine would work better. He thought it out carefully over a period of two years until he had an idea which he thought would work. He made a model out of all sorts of odds and ends, including his wife's thimble and he was able to make it pump beautifully.



But a model on its own was not enough. To make a full sized engine that could be tested James had to borrow money from friends. The poor health and headaches that had afflicted his childhood continued too, making it hard for him. In Glasgow he could find no workmen with enough skill to turn his idea into reality. Then he met Matthew Bolton, a Birmingham manufacturer who, seeing how useful the engine would be, made sure he had the funds he needed. Not only that but Bolton already employed many skilled men who could help make the engine.

James's engine had a separate condenser. The diagram above shows this type of engine. It used less coal and was much more efficient. Backed by Bolton James went on to develop his "rotative engine". This was useful in any situation where power was needed, not just for mine water pumps.

1 Adapted from Owen, Evan, *What Happened Today?* Book 1 available on the *Mothers' Companion* flashdrive <https://motherscompanion.weebly.com/>

2 A good explanation can be found here <https://www.youtube.com/watch?v=1VjzGaggyWw>

Such engines began to transform British industry. Iron manufacturers could use them to drive huge hammers. Cloth manufacturers harnessed them to drive the new machinery invented by Richard Arkwright. In coal mines they were used to lift coal to the surface. James Watt's improvement of the steam engine laid the foundation of a revolution in manufacturing and industry.

### Something to research

What was Richard Arkwright's invention? Use your own reference books and encyclopedias to find out.

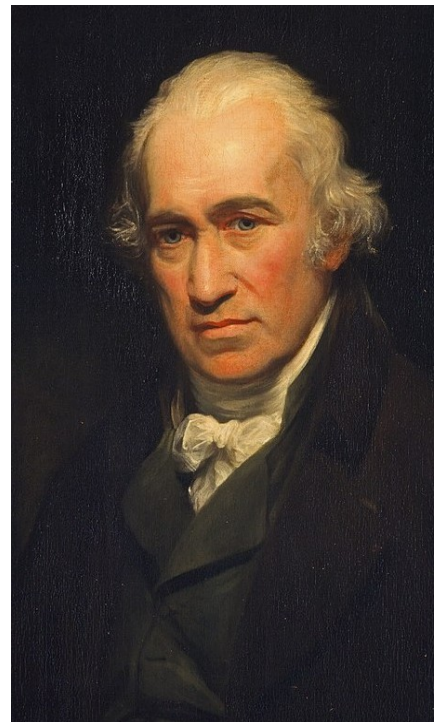
### Something to think about for older children

Watt was raised in a family that had a strongly Presbyterian and Covenanting<sup>3</sup> background. Secular historians have commented on the benefits this gave him of being able to think freely about scientific matters, enabling him to “think outside the box”.<sup>4</sup> Secular historians find it hard to understand why those who begin with the Bible as a basis for their thinking are often able to make great discoveries in the field of science. The reason is simple: the Bible is truth. It provides a lens through which we can see everything in the correct focus. It liberates us from false perspectives that shackle those who try to understand humanity without admitting that it is fundamentally sinful or who try to understand the world around them without admitting that God created it from nothing in six days about 6,000 years ago as described in the opening of Genesis. If you are constantly trying to make what you see fit in with a lie your progress is hampered. Truth is liberating.<sup>5</sup>

The tragedy of James Watt is that he had this wonderful gift and made use of it in scientific discovery – and then abandoned the truth for the fashionable but illogical Deism<sup>6</sup> of Bolton, Erasmus Darwin<sup>7</sup> and their circle.

Your own experience at the moment is not unlike that of the young James Watt – but I hope without the headaches! You have a Christian education provided for you at home. It will enable you to think much more freely than those of your peers who are in school because it is founded upon truth rather than on the shaky theories devised by men who want to find some way of shutting God out every time He becomes obvious to their thoughts.

Watts abandoned Biblical Christianity because he had never had a personal experience of Christ. He is an example of someone who “gained the whole world” in terms of scientific success and yet “lost his own soul” (see Matthew 16:26). Do not make the same mistake yourself. Seek the Saviour until you find him.



3 See the lesson for August 19<sup>th</sup> (yet to come)

4 e.g. *James Watt (1736-1819): Culture, Innovation and Enlightenment* Caroline Archer-Parré (ed.), Malcolm Dick (ed.) (Liverpool, 2020) pp.11-38.

5 See John 8:32.

6 Deism is explained in the lesson for 3<sup>rd</sup> March.

7 See the lesson for April 18<sup>th</sup>.

## Some musical history – the story of Hans Sachs<sup>8</sup>

Hans Sachs is pictured on the right. He died on 19<sup>th</sup> January 1576 at the ripe old age of 81. Although few people have heard of him, he was an important figure in the Reformation in Germany.

Have you ever taken part in a music competition, eisteddfod or local music festival? If you enjoy singing or are learning to play a musical instrument, look out for these as they can be a good way to learn to get used to playing or singing in front of other people.

People have been holding music competitions for a very long time. In German towns as far back as the fourteenth century, they were holding song contests to find the best singer and the best new song. The competitors were usually tradesmen of the town and the rules were very strict and complicated. The judges sat behind a curtain to listen and mark mistakes in each performance. All the songs were sung solo and unaccompanied and the judges scored the performers on the poetry, music and performance and one other factor about which I will tell you below. The singers who competed in these contests belonged to a guild and they were called *Meistersinger* or “Master-singers”. In the town of Nuremberg, the shoe maker, Hans Sachs (1494-1576), was the very best of the singers. He was an especially prolific song writer pouring out many sets of verses which were very popular.



Hans Sachs had been born in Nuremberg where his father was a tailor. He himself had decided to take up shoe-making rather than tailoring and after serving as apprentice he became a journeyman, as was the custom, travelling around practising his trade for a period and then returning to Nuremberg. What happened during his travels is best explained in the words of the Swiss historian J. H. Merle D'aubigné and I have put his account of Hans Sachs's adventures and conversion in today's optional resources files.

If you did the lesson for July 16<sup>th</sup> or if you read the Optional Resources extract for 31<sup>st</sup> October you will know about Martin Luther.<sup>9</sup> After the Diet of Worms of 1521 Luther's ideas gained acceptance in Hans Sachs's native Nuremberg. From then on there was another judge behind the curtain in the song contests. His job was, Bible in hand, to check the contents of the song against the truths of Scripture.

When the reformation reached Nuremberg, for three years Hans Sachs wrote not a single song. Instead of composing words and music while making his shoes, he spent his time pondering on Luther's ideas. Scripture alone, salvation through faith in Christ alone; Hans Sachs revolved these wonderful things in his mind as he worked. At last, as though a dam had burst, he broke out into song again. His allegorical verses “The Wittenberg Nightingale” were the result and they were a huge popular success. In the verses Hans Sachs uses various creatures to depict the characters of the drama that had been going on in Germany.

The first part of the song tells how the sheep, dazzled by treacherous moonlight, left their shepherd to follow a lion who traps and kills some of them. Wolves and snakes torment others but then they are awakened from their blindness by the singing of a nightingale. This enrages the lion and he tries to stop the nightingale singing with the help of some other animals such as a donkey, a pig, a goat, a cat, a snail, a frog and some wild geese. Their efforts are in vain and the nightingale

<sup>8</sup> Information from <https://www.torch.ox.ac.uk/article/the-wittenberg-nightingale-trigger-of-hans-sachs-success-as-voice-of-the-reformation-in-nure> and other sources.

<sup>9</sup> You can read these lessons today if you need to know who Luther was and what he did.

continues his song until dawn breaks and the sheep return to their shepherd and the safety of the pasture.

In the second part of the song there is an explanation of the meaning of this allegory. The nightingale is Luther and the lion is the pope. The wolves and so on are the bishops, cardinals and other officials of the Catholic church. The other animals were all Luther's enemies. Dr Eck,<sup>10</sup> for instance, was the pig. A summary of Luther's teaching follows and the song ends with an exhortation to the listener to stand firm in the faith.

The image of Luther as “The Nightingale of Wittenberg” stuck firmly in the popular consciousness and given Luther's own musical abilities, it was the perfect image for him. Hans Sachs's verses spread through Germany like wildfire and Luther's ideas spread with them.

If you did these lessons last year you may remember Albrecht Dürer about whom we learned in April.<sup>11</sup> He also lived in Nuremberg at the same time as Hans Sachs so they would have known each other. Both men in their own areas of the arts were great supporters of Luther. On the right is a Victorian imagining of a scene in which Dürer visits Sachs in his home. In the background you can see Sachs apprentices at work. Sachs himself, in his shoemaker's apron, is reading, or perhaps singing, some of his lines to Dürer.

### Something to sing

You could hold your own music competition or festival in miniature. Choose a hymn that everyone knows. Then assign a verse of the hymn to each member of the family. Now sing the hymn with each person singing “their” verse as an unaccompanied solo just as Hans Sachs and his fellow *Meistersingers* would have done. You can do some practice first if you like. Concentrate on making the words clear. Breathe where there are commas. When you are ready, someone can score the performances if you wish or you can just sing without competing. In today's Optional Resources files I have put one of Hans Sachs's tunes called “Silver White” with some words distilled from “The Wittenberg Nightingale”. To our modern ears the tune sounds rather strange (and, of course, we have no real idea of how Hans Sachs would have sung it) but you can try to sing it yourselves.



<sup>10</sup> See the lesson for 6th July.

<sup>11</sup> See the lesson for 6<sup>th</sup> April.