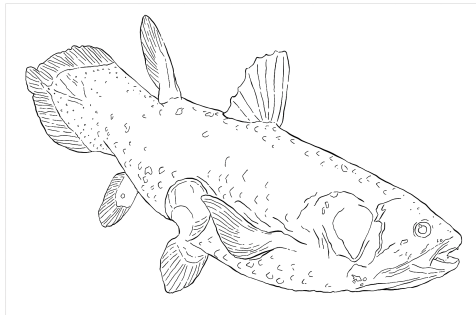


December 20th

Memory verse:

And God called the light Day,
and the darkness he called Night.
And the evening and the morning
were the first day. Genesis 1:5

A fishy story to read¹



On December 20th 1952, a fisherman named Ahmed Hussein was fishing in about 20 metres of water off the island of Anjouan in the Cormoro Islands, near Madagascar. He had the good fortune to catch a large and ugly fish weighing about 45 kg. Within days his name had appeared in newspapers throughout the world, for Ahmed Hussein had caught a coelacanth. At first Ahmed did not realise he had caught anything unusual. He killed the fish by hitting it on the head and then he and his friends began to prepare to salt it in order to preserve it for sale and eventual consumption.

But someone came along who recognised what kind of fish it was that had been caught. Quickly he sent a telegram to Professor J.L.B. Smith, a South African scientist who had confirmed the identity of the first coelacanth ever to be discovered. The professor got on a plane for Anjouan at once.

The first coelacanth had been caught 14 years previously. Before that it was thought that coelacanths were extinct and existed only as fossils. Even after the first one had been found some people wondered if, as there was only the one found, perhaps it was some sort of freak. However, the finding of a second coelacanth proved that this was not the case.

But why was – and is – the coelacanth so important? You will have to wait until the day after tomorrow to find out – unless, of course, you take a sneak preview! The rest of the coelacanth's remarkably interesting history is in the lesson for 22nd December, the anniversary of the finding of the first Coelacanth fossil in 1938. Meanwhile, find the places highlighted in green in your atlas.

A fishy game to play

Here is a game for two of “catching a fish” that younger children might enjoy. It can be played outdoors on a smooth surface such as a yard or indoors.

Each player cuts out the simple shape of a fish from paper. You can use newspaper and your fish can be of any shape – you could try a roughly Coelacanth shape if you like! Both players should have fish of the same size. They should be about 20cm long.

Each fish should be tied to a piece of string and the string tied around the player's waist. The string should be of such a length that the fish just lies flat on the floor behind the player when he is standing up.

The players stand facing each other. Someone signals the start of the game by shouting “go”. Each player tries to stamp on the other's fish. The first to do this is the winner. Players must not use their hands but may move about freely in the available space.

¹ Adapted from Owen, Evan, *What Happened Today?* Book 3 available on the *Mothers' Companion* flashdrive <https://motherscompanion.weebly.com> and other sources.

Something to look at



On 20th December 1629 the Dutch painter, Pieter de Hooch, (1629-1684) was born. His speciality was quiet domestic life often with an open doorway in the picture. He loved to paint happy household scenes especially mothers with their children. He pictured every day tasks such as peeling apples, slicing bread, making beds or putting away folded linen and his pictures give us a view into the tall, spacious Dutch houses with their clean uncluttered interiors. On the next page is his picture "The Courtyard of a house in Delft". The house is a smart new brick and stone one. Over

the courtyard door is a stone which has been incorporated into the new house from an old monastery probably destroyed in the great fire that burnt down much of the city's wooden housing in 1654 when a government gunpowder store exploded. "This is in Saint Jerome's dale, please be patient and meek, for we must first descend, if we wish to be raised," says the inscription in Dutch.

Spend some time looking at the details of the picture carefully. The painter has put his initials and the date on one of the stones. Can you find it? Can you work out how long after the Delft fire the picture was painted? Your answer will set a limit on the age of the house at the time the picture was painted.



The picture is divided into two unequal parts. On the left we see the passageway that leads to the street. Here stands the lady of the house with her back to us, looking into the street through the open door. Everything in this part of the picture is neat and ordered. The other half shows a servant and a child. Can you see what the servant is carrying? The buildings on this side of the picture look older and more rough and ready. The child has something too that she is carrying in her apron but we cannot see what it is. Some kind of vine is growing on supports between the new house and the old brick outbuildings from which the whitewash is almost completely worn away. We can just see the edge of a kitchen garden and the courtyard floor has been swept and the broom left lying. The artist's use of perspective makes us feel we could almost step into the picture.²

Some people enjoy learning the details of a great picture by colouring an outline drawing themselves. I have included an outline version of this painting in the optional resources files for today in case you would like to try it. Another option would be to make your own sketch of some small details of your back garden.

A story from engineering history

The Pennines are the "Backbone of England" a range of high hills that the railway from Manchester to Leeds has to cross. It crosses at the point where the Pennines form the watershed between Lancashire and Yorkshire. Do you know what a watershed is? It is a ridge that separates waters flowing into different river systems. You can see what this means if you look at a topographic map in an atlas.³ Below this story are some instructions for you to make a model of a watershed yourself.

Railways cannot go up steep slopes so at the highest point of this railway line there is a tunnel. It is called Summit Tunnel and it is one of the world's oldest railway tunnels. When it was first built in 1841 it was the longest railway tunnel in the world and it still carries trains today.

The Manchester and Leeds Railway was built between 1838 and 1841 to provide a direct line between Leeds and Manchester. George Stephenson (1781-1848) who, along with his assistant, Thomas Gooch, built the tunnel, said, "I stake my reputation and my head that the tunnel will never fail so as to injure any human life". If he had been able to see the tremendous test that his tunnel would one day have to undergo he would have been astounded – and pleased that it passed the test.

On **20th December** 1984 a train of thirteen petrol tankers pulled by a diesel engine entered the tunnel at about ten to six in the morning. The train was about a third of the way into the tunnel when a problem with an axle-bearing caused the fourth tanker to come off the rails. This in turn derailed the tankers behind it and caused the automatic braking system to halt the train. The crew went back to investigate but quickly had to retreat as the petrol spilled from the damaged tankers had been ignited, probably by a spark from the axle-bearing, and there was now a fire.

² There is a lesson on perspective on 26th October.

³ There is one here: <https://en-gb.topographic-map.com/maps/b9/England/>

The crew ran a mile to the tunnel mouth where they alerted the signal box to what had happened using the line-side telephone. Two fire brigades arrived and under their guidance the train crew re-entered the tunnel, uncoupled the first three tankers from the derailed ones and used the engine to pull them out of the tunnel and away to their destination.



During the construction of the tunnel, vertical shafts had been made into the hill. These remained when the tunnel was completed and provided ventilation in the tunnel, allowing smoke from steam engines to escape. The two fire brigades had trained

together quite recently on what they should do if they were called to a fire in this particular tunnel and now they quickly used the ventilation shafts to carry hoses down to the site of the fire. Firemen with breathing equipment went into the tunnel to try to get the blaze under control. They began fighting the fire but then had to leave the tunnel. Petrol in the tankers had turned to vapour in the heat, causing valves in the tankers to open and release vapour into the hot tunnel. The vapour caught fire and as the heat increased the bricks in the tunnel wall began to melt. The firemen got out of the tunnel just in time. There was a huge explosion and flames leapt out of the ventilation shafts on the hillside.

Now the situation was very dangerous. Houses in the area were evacuated and roads were closed. Gasses forced out of the ventilation shafts burst into columns of flame 45 metres and at times 150 metres high. Pieces of the red hot tunnel lining shot out of the shafts like lava bombs from a volcano, setting the hillside grass on fire. The fire brigades could no longer get near the fire. Some of the ventilation shafts were further away from the fire. The firemen could reach these. They pumped special foam down them into the tunnel to block air from the fire. The main fire was out by mid afternoon on the following day. However, the tankers were still inside the tunnel. As petrol vapour leaked out of them and came into contact with the hot tunnel walls it would burst into flame. The fire brigades continued to fight the fire for another two days and remained on the site until 3rd of January.

The fire in Summit Tunnel was one of the biggest tunnel fires ever recorded. It was bigger than the Fire in the Channel Tunnel in 1996 and only one tunnel fire (in France in the 1970s) may possibly have been bigger. No lives were lost due to the fire but how would Stephenson's and Gooch's work stand up to temperatures that could melt bricks and also explosions that shot molten metal and fragments of tunnel lining high into the air? Would the tunnel have to be closed, its life now over?

When investigators were able to examine the damage they were surprised. Some of the bricks in the tunnel and in the shafts had become so hot that they ran like molten glass but most of the brickwork lining of the tunnel was still doing its job perfectly well, although scorched. Work began replacing the track and signalling and the line reopened in August 1985. Just before that though, local people had a treat that no one else will probably have again. They were allowed to walk right through the newly repaired tunnel before it went back into service!

Something to make – a watershed model⁴

This simple model will help you understand exactly what a watershed is and how it works.

All land “sheds” water from rain and melting snow into a specific stream, river system, lake or sea. Mountains, hills, or other high points provide a point where water going in one direction is separated from water going in another direction. This is called the Watershed. Water that falls at the Pennine watershed flows either east or west. Water that flows into the sea on the east coast of Britain could have started off very close to water that flows into the sea on the west coast!

You will need:

Some sheets of strong paper. Marker pens. A spray bottle. Some old towels.

What to do:

Crumple up one sheet of paper in your hands. Now open it but do not flatten it. You need some some high and low places just as you would see on a relief map. The high places represent hills, the low spots, valleys.

Use the marker to draw on the paper where you think the streams and rivers would be on you “model” landscape. Now you can test your predictions.

Put the paper on the old towels to prevent the water making a mess. Spray a fine mist over the watershed model. Keep spraying until there is enough water to flow down the hills. Did you draw the streams and rivers in the right places?

⁴ To make a more complex model you could use the instructions found here:
<https://serc.carleton.edu/eslabs/drought/2a.html>