17th May

Memory Verse

What manner of man is this, that **even the winds and the sea obey him**! Matthew 8:27

When Jesus calmed the storm at sea his disciples were amazed and this is what they said. You will understand why I chose this text for a memory verse this week when you read tomorrow's story. Little ones can say the words in bold and understand that "him" is Jesus.

How did the technology that we enjoy today develop? Was it that people began with no technology and invented first of all primitive tools and then more advanced ones? Did they gradually gain enough leisure through the use of simple tools to spend time inventing writing and thinking about mathematical ideas? Did people become cleverer as time went on and thus able to achieve more and more advances in fields such as medicine and engineering? Or was it just that each generation built on the knowledge of the one before so that a gradual progress took place, culminating in the computers and mobile phones of the twenty-first century?

Today's story about a discovery made in 1902 sheds an interesting light on the way technology developed.

Captain Dimitrios Kontos and his crew of Greek divers were working off the coast of the island of Antikythera. They were collecting sponges that grow on the bottom of the ocean. Nowadays our bath sponges are usually not real sponges; they are made of synthetic foam. But divers still dive for real sponges and you can still buy them, although they are more expensive than the synthetic ones. On this particular dive, however, Captain Kontos's men discovered something far more valuable than sponges. They found the wreck of an ancient ship from classical times. A ship that had been so overloaded that a storm had sent her to the bottom. And still lying there on the sea bed were the beautiful statues, pottery, glass ware, bronze and marble that she had carried – a true treasure hoard.

Over the next nine months the divers brought up some of Ancient Greece's most beautiful artefacts. The treasure was taken to the National Archaeological Museum at Athens where it was cleaned and put on display. The pottery and other items on the wreck indicated a date of 80 to 50 BC. On 17th May 1902 the director of the museum, Valerios Stais, was examining an artefact which had been taken from the wreck along with the works of art and broken wine jars. It had arrived at the museum as one lump of corroded metal but while it was there it had split into three main parts. Dr Stais noticed to his surprise that embedded in one of the large parts was part of a gear wheel.[1]

A gear wheel! It was known that the ancient Greeks had some primitive big wooden gear wheels for mills but not precision engineered metal gears like this. What was this thing?

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It took quite a long time to work out exactly what it was that had lain on the sea bed for so many hundreds of years. The thing became known as the Antikythera Device but what did it originally do? Was it some kind of astronomical clock? Dr Stais thought it was but other authorities decided that it was too complex to have been made during the same period as the other pieces that had been discovered in the wreck. Somehow it must have come from somewhere else later on.

Interest in the strange object died down until a science historian, Derek J. de Solla Price, whose special field was studying the rate at which scientific knowledge grows, became interested in the device in the 1950s. He and a Greek nuclear physicist took x- ray pictures to see what was inside the Antikythera Device in the 1970s. Dr Price identified inscriptions which confirmed that it was made in around 87BC so it had *not* somehow found its way onto the wreck from elsewhere. It was becoming clear that the Antikythera Device really was an astronomical clock of some sort and from some of the observable gear wheel settings Dr Price concluded it was lost within a few years of being made.

Meanwhile the famous French diver and inventor of the aqualung, Jacques Cousteau,[2] organised a dive on the wreck. He found more fragments of the device and brought them to the surface. Cousteau identified the ship as Roman, probably on the way back to Rome loaded with Greek goods. He found coins which confirmed the dating.

In 2006 special high resolution x-ray images were made and revealed the device to be immensely complex. They also enabled much more of the inscription to be read using computer enhancement of the x-ray images. This information allowed technicians to build accurate copies of the mechanism, revealing that it was designed to show the relative position of the moon, sun and all the planets known to the ancient Greeks on a dial, expressing their movements as observed from earth in terms of an Egyptian calendar. The phases of the moon were also indicated and the device could calculate when there would be lunar or solar eclipses. It could also be used to indicate the Olympiad or four year period used by the Greeks to count time. Prime numbers feature in the design of the mechanism which is of enormous mathematical complexity. Such complexity, in fact, that it is now regularly called an analogue computer.

An analogue computer in 80 to 50 BC? Yet no one had any idea that the ancient Greeks, or anyone else at the time, were capable of such things. Its existence throws up all sorts of questions about how much we know about the past. It also points to the fact that knowledge does not proceed steadily from generation to generation in an upward direction. The knowledge of the construction of such machines had died out, or simply been overlooked, for hundreds of years. Not only that but it had become completely invisible to historians. Nothing as complex as this appears for another 1,000 years in the records. The technologies that we now consider to have been invented in the eighteenth century could possibly have existed much earlier – perhaps from the beginning of time. What else could the Greeks do that we don't know about, I wonder!

In the Bible we learn that people are not getting cleverer due to some force such as evolution. In fact, due to the effects of the Fall in the Garden of Eden, we are, if anything, suffering a gradual diminishing of our mental powers. It is true that we can preserve information from one generation to the next and thus build on the knowledge of the past. This enables us to make advances in science and technology, although as human beings we are not getting any cleverer. But this building is very fragile. It only takes a significant disruption of society for knowledge to become lost as the Antikythera device demonstrates.

Oh and what about the ship that carried this amazing item? It has been suggested that it was being taken from Rhodes to Rome, together with other looted treasures, to support a triumphal parade

2 More about Cousteau in the lesson for 11th June.

being staged by Julius Caesar. This fits in with the dates and explains why it carried so many beautiful items but we shall never know for sure. One thing is certain, Caesar never got his wonderful astronomical clock!

Something to do

If you have gears in your Meccano, Lego, or K'nex sets, today would be a good time to get them out and experiment with them. Today's optional resources include an instruction sheet for making your own gears and experimenting with how they work.[3] You can use your gear sets to do the investigations suggested on the sheet or make your own according to the instructions. Older ones might like to try their hand at some kind of clock.[4]

3 By kind permission of The Ogden Trust 10/03/2021

4 Inspiration can be found here: https://vimeo.com/17648733