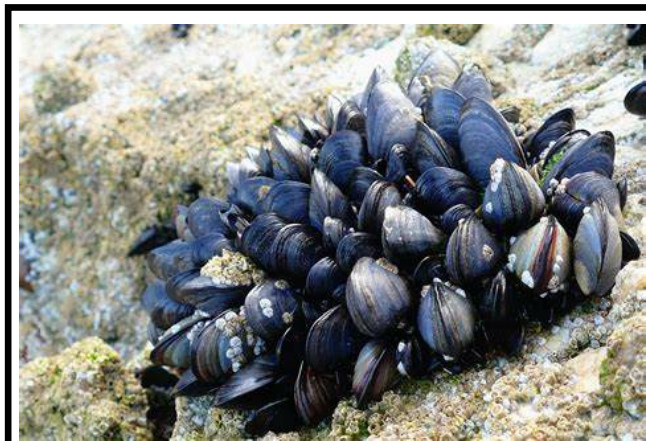


# **GOD did it FIRST!** UNDERWATER GLUE

**H**AVE you ever been to the seaside and seen mussels stuck fast to the rocks? If you tried to get them off you would find it almost impossible. Mussels are shellfish which feed on microscopic water creatures called *phytoplankton* from seawater, and they depend on the twice-daily tides to bring in their food. Many people around the world eat mussels.



Mussels stick so well to rocks that it is very difficult to remove them. Yet they can remove themselves and move to another rock.

Mussels stick to the rocks by tiny threads using a special glue. This holds them firmly to the rocks, even through the worst storms. They will even stick to the outside of ships and hitch a lift across the oceans. This glue is stronger than any glue invented by humans. It's very difficult to get glue to set underwater. Yet mussel glue does just that. It is so special that scientists have copied it, using chemicals produced by mussels to make super-glue and sticky tape (left) that sets on wet surfaces and even underwater.



Doctors are also copying mussel glue to make dressings that stop bleeding and stick well to wounds on people recovering from operations,

and are finding that healing is much faster than normal. Unlike normal plasters, which come off when they get wet, those copied from mussel glue stay put.

**The scientists who copied mussel glue had to use their intelligence. It didn't happen by accident. Mussels didn't discover how to make their glue by accident either. God must have created them that way.**

## OUR GREAT GOD CARES ABOUT LITTLE THINGS

**W**HEN we think about God's creation we often think of large things like the galaxies in space. The Bible tells us that God not only created the stars, but that "He calls all the stars by name. He is very strong and full of power. So not one of them is missing." (*Isaiah 40: 26*). Yes, galaxies are truly wonderful, but a tiny microscopic cell is even more wonderful. Why? Because a galaxy is just a collection of stars, whilst a cell is an amazing factory, full of tiny living machines.



Our great God cares about little things, too, and most of all He cares for us. We are all different — we even have different fingerprints. Jesus said, "God even knows how many hairs you have on your head." (*Luke 12: 7*). We are special to God who created us.



He loves us so much that He sent Jesus, His Son, to die for us. We have all done wrong things, and God is not pleased about that, but when we accept that Jesus died for us, God forgives us. And because Jesus rose from the dead, those who love Him will live with Him for ever. That's how great God is!



## PUZZLE ANSWERS

- CROSSWORD:**
1. Slice through a rose stem.
  2. A spider's eyes.
  3. Dragonfly's wing.
  4. Butterfly's wing scales.
  5. Moss leaf cells.
  6. Sand grains.
- CROSSWORD:**
1. Mussels.
  2. Creator.
  3. Pollen.
  4. Flowers.
  5. Cell.

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# GOD'S INVISIBLE WONDERS



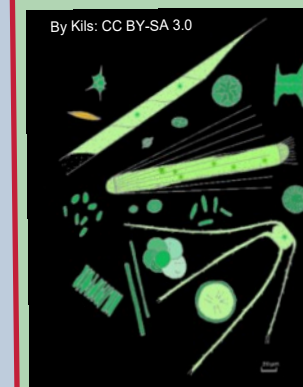
Amazing things that we can't see without a microscope!

## Why is small beautiful?

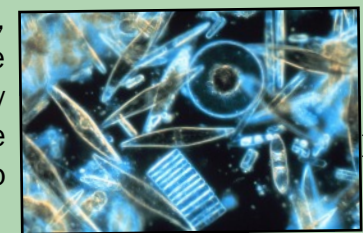
We live in a beautiful world where we see so many things that remind us of God, the Creator. But there are also many amazing and beautiful things that we can't see without using a powerful microscope. If everything in the world evolved by accident, why would things we can't normally see be beautiful? However, if God created everything, then He knew that people would invent microscopes so that they would be able to see these things and praise Him for them.



## Life that we can't see (without a microscope!)



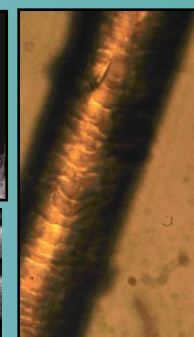
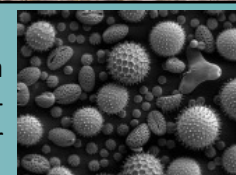
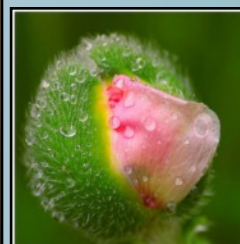
If you took a drop of water from a pond or river it might look clear, but if you placed it under a microscope you would see an amazing hidden world of tiny creatures and plants. Things like a *ciliate* (right) which is a single-celled water creature. This photo is magnified 400 times! Then there are *photoplankton* (left), and *diatoms* (right) These beautiful organisms provide food for fish and other water creatures. But why are they so beautiful? They don't really need to be to survive. We believe that the only reason they are is that God, who loves beauty, created them that way!



## Explore God's creation with a microscope!



If you are able to use a microscope, either at school or at home, you can have lots of fun exploring God's hidden creation. Many things look very different when they are magnified. Take a look at a dandelion seed (above right), a flower bud opening (below left), or some pollen grains from a flower (right). Or how about looking at one of the hairs from your head? (Picture far right)



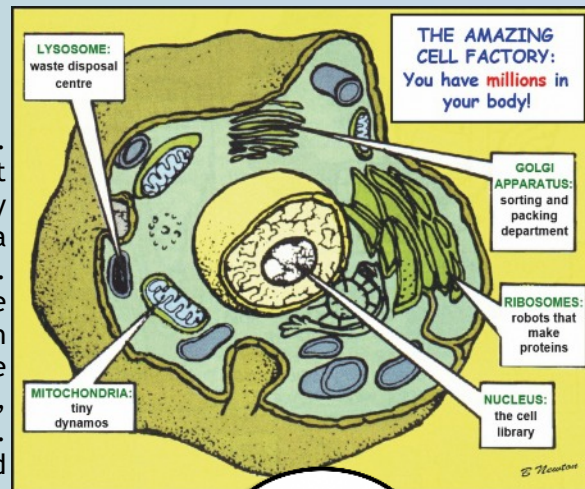
A human hair

**ALSO IN THIS ISSUE:** Tiny machines that keep you alive; Nature Notes: Bumblebees; Amazing little "water bears"; The Hidden World; Puzzle Corner; God Did it First! Underwater Glue; God cares about little things



## Tiny machines inside your body that keep you **ALIVE!**

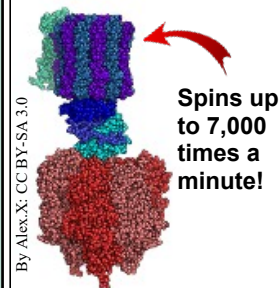
Your body is made out of **cells**, which are like tiny factories. There are millions of them in your body, working day and night to keep you alive. What makes them alive and where did they come from? They are so tiny that they can only be seen by a powerful microscope! Inside each cell are really tiny machines. There are the **ribosomes** – robot-like machines which make proteins. Then there are dynamos called **mitochondria**, which turn fat and sugar into energy. In another part of the cell are the **golgi apparatus** – machines which sort and parcel up proteins, then either store them or send them to another part of the cell. There are also rubbish collection and recycling machines called **lysosomes**. All these amazing tiny machines keep you alive!



WOW!  
THAT'S  
AMAZING!

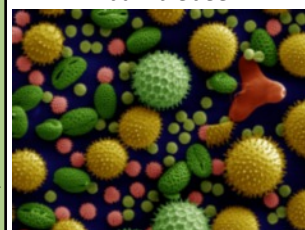
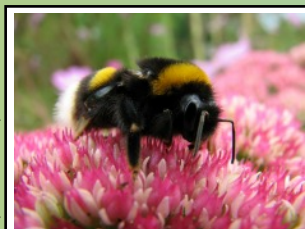


### The ATP motor



Can you imagine an engine 200,000 times smaller than the head of a pin? Well, you have trillions of them in your body. Known as ATP motors, they spin as fast as 7,000 times a minute as they capture and transfer energy in all the cells of your body. You couldn't stay alive without them. Where did they come from? No one has ever been able to explain how they could have been made by gradual evolution. Only God could have created something so amazing!

## NATURE NOTES by the editor



You may have seen bumblebees buzzing around, collecting pollen and nectar from flowers. Although they do this for their own benefit, they also do the very important job of pollinating flowers. Without bees and other pollinating insects, many flowers would not survive. It is believed that nearly half of the food grown in the world depends on wild bees, including bumblebees. This is why many people are worried that some of the chemical sprays used to kill insect pests in gardens and fields could be harming bees.

Bumblebees can fly quite a long way in their search for suitable flowers. Scientists have placed tiny tags on bees, and have been amazed at how far they fly,

and how they find their way back to their nests. The tests show that bumblebees often fly up to 5 km (3 miles), and in the longest flight – recorded in the north of England – some bees flew 13 km (8 miles)! Scientists have also found that bumblebees leave chemical “notes” on plants to tell other bees when they have taken all the pollen. These tiny insects, and the plants which depend on them, point to the work of a wise Creator. We should certainly do our best to protect them! —*Geoff Chapman*



This fossil Bumblebee is very much like living ones. This shows they haven't changed!

By Dehon 'et al': CC BY-CA 4.0



## The Amazing Little “Water Bears”

Tardigrades (left) are tiny eight-legged creatures that can only be seen through a microscope. Yet they look quite fierce when you see them close-up. They have claws like bears and sharp teeth that tear open moss and algae to suck out the juice.

Tardigrades have been nicknamed “water bears” because they do look rather like tiny bears. They can be found almost anywhere on Earth, from the highest mountains to the bottom of the ocean. They can live in the icy Antarctic or in hot springs.

You can boil them, bake them, crush them or freeze them, but they still survive. They can even survive in outer space, and only need a drop of water to live. If they don't have water, tardigrades will curl into a dry ball and almost die. They have been known to stay like this for 100 years, but come alive again when water touches them!

Where did these amazing creatures come from? Fossils of tardigrades show no evidence that they evolved from anything else. They are so well designed that it makes most sense to believe that God created them when he made “crawling animals” on the sixth day of creation. (*Genesis 1: 24*).

## DISCOVERING THE HIDDEN WORLD



Organisms with just one cell, such as bacteria (left), were first discovered by Antony van Leeuwenhoek (right). He lived from 1632 to 1723 and made over 500 microscopes, some of which magnified things 500 times. He was a Christian, and believed these tiny organisms were so perfect because they were created by God. He also rejected the idea that life could have come from non-life

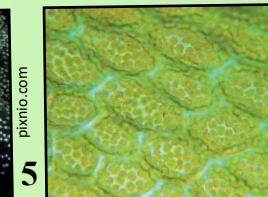
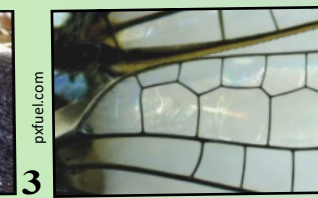
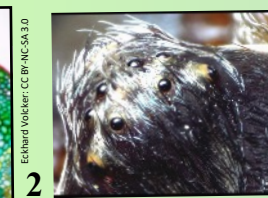
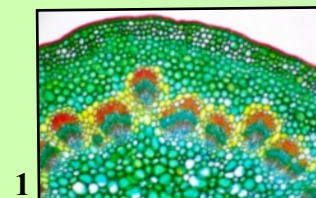


Another man who used microscopes was Robert Hooke (below left), who lived around the same time as Mr van Leeuwenhoek. King Charles the 2nd asked Robert Hooke to study things under a microscope. He took photos of a slice of cork (below right), and discovered that it was made up of lots of empty spaces with walls around them. He had discovered cells! We now know that all living things are made of cells. He took photographs of lots of microscopic things, and found that the more he magnified them the more perfect they looked. He believed that this showed the power of “the great Creator.”



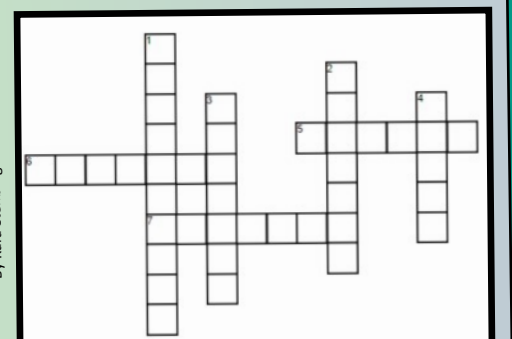
## PUZZLE CORNER

Below are highly magnified nature photographs. Do you know what they are? Why not have a guess?



### CROSSWORD

Using words from this paper



1. It makes things look larger.
2. Bees pollinate them
3. They stick to rocks.
4. We have millions of them in our bodies.
5. Bees collect this.
6. Tiny sea creatures.
7. God is this.

(Answers on the next page)