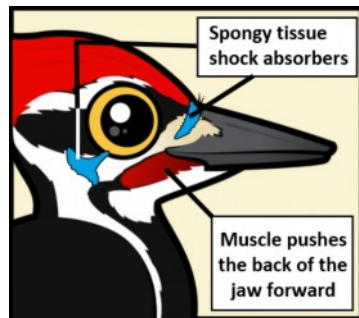




GOD did it FIRST!

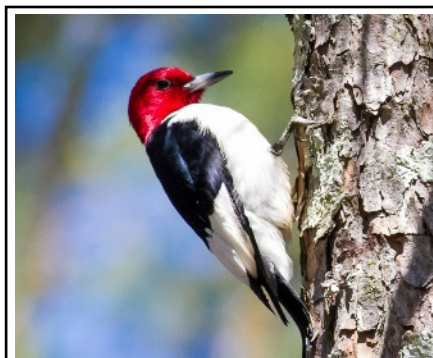
SHOCK ABSORBERS

HAVE you ever heard a woodpecker drumming its beak against a tree as it searches for insects? Woodpeckers can bang their heads against a tree 20 times a second, for as long as 6 hours at a time, and may do this around 12,000 times in a day! So why don't they damage their brains?



Scientists have taken X-Rays of woodpeckers' skulls, and discovered that they have several special parts which protect them. These include two 'shock absorbers' made of spongy tissue and a muscle that pushes their jaw forward every time they hammer a tree (see picture, left). Woodpeckers also have a third eyelid, which closes every time they hammer with their beak. Without this their eyes would likely pop out when they hammer at trees! They also have less fluid between their brain and skull than other animals. This stops their brain moving around.

Human engineers have designed many different shock absorbers, and even copied the woodpecker's design to make better ones – like the helmet on the right, but they used their intelligence to do it. Woodpeckers couldn't have evolved their shock absorbers gradually or they would have damaged their brains before they were perfect. We believe God designed them that way. As in so many cases, God did it first!



A Red-headed Woodpecker

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Image: helmets.org

Designer Anirudha Surabhi copied the design of a woodpecker's skull to create this new, super-strong *Kranium bike helmet* to protect cyclists' heads.

ONE BIG STEP!

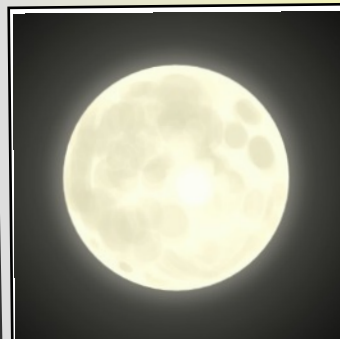
We have seen how special our moon is, and why we need it. God thought of everything when he created the earth to be our home! In 1969 Buzz Aldrin and Neil Armstrong became the first humans to step on to the moon. That was a special day. Neil said: "That's one small step for man, one giant leap for mankind." Look at the moon on a clear night, and remember that someone has walked there!

It was even more wonderful when our Creator visited the earth in the Person of Jesus. That was a "giant leap for God!" Jesus left the wonder and glory of heaven to come to show us how we ought to live, and to die for the wrong things we have all done. God's book, the Bible, says: "Christ died for us while we were still sinners. In this way God shows his great love for us." (*Romans 5: 8*).



Buzz Aldrin on the moon

NASA photo



The moon: reflected light

Jesus came back to life again, so that everyone who believes in Him can live for ever in heaven when our life on earth ends. We can walk with Him in heaven – more wonderful than going to the moon! Jesus said "I am the light of world. The person who follows me will never live in darkness." (*The Bible, John 8: 12*). Jesus also said that His followers should be like lights in the world.

The moon has no light of its own; it reflects the sun's light. When we turn to Jesus He wants us to be like the moon – reflecting His light so that others can see that we belong to Him, and want to know Him too. We can all help to make this world a brighter place if we let our light shine!

PUZZLE ANSWERS

MOON QUIZ:

1. Two. * 2. Sun and moon in line.
 3. When the moon is between us and the sun. * 4. When we only see it's dark side. * 5. When the moon is in front of the sun. * 6. From the sun. * 7. 1969.
 8. Phases. * 9. The corona.
 10. It brings them food.
- *Occasionally there is only one tide in a day, because the interval between tides is more than 12 hours.

BIBLE VERSE:

You made the moon to mark the seasons. And the sun always knows when to set. (*Psalms 104: 19*)

Scriptures quoted from The Holy Bible, New Century Version®. Copyright © 2005 by Thomas Nelson, Inc.. Used by permission. All rights reserved.

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OUR SPECIAL MOON



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Without it life wouldn't be possible!

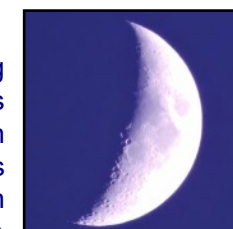
THE MOON: "A WITNESS IN THE SKY"

THE moon is around 384,400 km (238,855 miles) from earth, though the distance varies during its monthly journey around our planet. The moon has no light of its own, but reflects the sun's light. This means we sometimes see only part of the moon (right), and when the moon is between us and the sun we don't see it at all. We call this a "new" moon. Our view of the moon changes every day each month. They are called *phases*. Our moon is dependable. We know exactly when the phases will happen, and they haven't changed since God created the moon. The Bible calls the moon "a lasting witness in the sky." (*Psalms 89: 37*). It reminds us of our unchanging God.

Occasionally, the moon comes exactly between us and the sun and blocks out the sun. This is called a *total eclipse* (lower right). Although the moon is 400 times smaller than the sun, it's also 400 times *closer* to us, so it appears to be exactly the same size in the sky! During a total eclipse — which only lasts a few minutes — astronomers have a brief chance to examine the outer part of the sun's atmosphere, called the *corona*. It seems amazing that the moon just fits over the sun, even though the sun is so much larger and farther away. Surely this is not by chance?



The Bible tells us that when God created the world "He made the smaller light to rule the night." (*Genesis 1: 16*.) That was the moon. On a clear night a full moon gives a wonderful, gentle light (*left*).



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Why we couldn't live without it

The earth travels around the sun once a year. Because it's so large, the pull of its gravity keeps our planet from wobbling. If the moon disappeared life would be impossible for us. The earth would sometimes tip right over on its side. The climate would go crazy and huge tides would sweep over the continents. The pull of the moon also makes the earth spin more slowly. Without the moon, our days might be only 6 hours long instead of 24 hours! The length of our day is just right for us, allowing enough time for work and sleep.

Where did our moon come from? Some scientists believe that, millions of years ago, the earth was soft and molten, and that a lump flew off which became the moon. Others say that the moon was formed when a large object collided with the earth and knocked a chunk off! No one was there to see how the moon was made, so these ideas are just a fancy.

We believe God created the moon for our benefit, and made it just the right size and distance from us. We have just the moon we need!



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ALSO IN THIS ISSUE:

Many moons - but none like ours!

The Nature Detective's Casebook
How the Tides bring Life

Using the Power of the Tides

Puzzle Corner

God did it First:
Shock Absorbers.

One Big Step!

MANY MOONS – BUT NONE LIKE OURS!

THERE are lots of moons orbiting other planets in our solar system. Some of them are tiny, while others, like Titan – one of Saturn’s many moons – are larger than our own moon.

We really do need our moon, and it’s just the right size and distance from the earth to help us live safely. The moon’s gravity causes the twice-daily ocean tides. These keep the water in rivers and harbours fresh by allowing oxygen to get into the water.

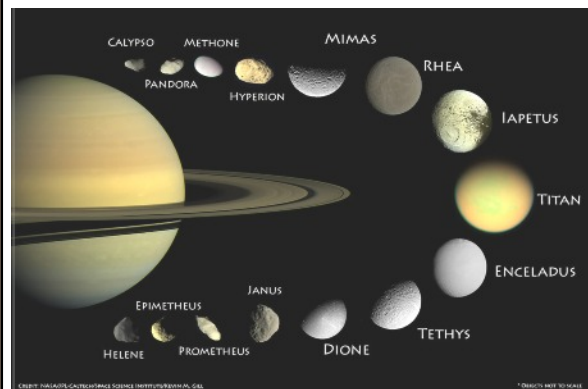
So if we had no moon, or even a very small moon, there would be no tides. Suppose our moon were much larger, or closer to us? Then, huge tides would sweep over the earth twice every day, making life in many areas impossible. Millions of sea creatures also depend on the tides to live (see next page).

God created our moon just the right size, and the right distance from us, so that the daily tides are life-giving, not life-destroying.

The Tides (not to scale)

The moon’s gravity makes our twice-daily tides. When the sun and moon are in line, the extra pull makes the highest (spring) tides.

SATURN’S FAMILY OF MOONS



The planet Saturn has at least 160 moons! The largest is Titan – 1½ times the size of our moon. If Saturn had oceans, just imagine what the tides would be like!



The Nature Detective’s Casebook

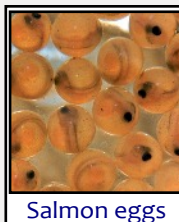
Last summer I spent a holiday in Scotland. While walking beside a big river I noticed some salmon trying to leap up a waterfall. (right). Some tried several times, but eventually made it. Why did these fish want to jump up over the waterfall? I asked a man who was there on a fishing trip. “They’re trying to return to the place where they were born.” he explained. “They’ve been living in the Atlantic Ocean for a couple of years or more. The female salmon always return to lay their eggs in the river where they were born.”



“The same river?” I asked. “How do they find their way back?” “Scientists think they use the height of the sun to guide them, but we know they use their sense of smell, too,” he replied. “Once, some salmon were caught and their nostrils were blocked, and they weren’t able to find their way home, so they must use their sense of smell.”

I learned that, after hatching, the young salmon (called parr, left) stay in the rivers for several years before making their way down the river to the ocean, to begin the cycle all over again. I thanked the man for explaining all this, and said, “Surely salmon didn’t get their ability to migrate by gradual evolution? They needed to be able to find their way back the first time! I think God must have designed them with their clever ability to migrate!”

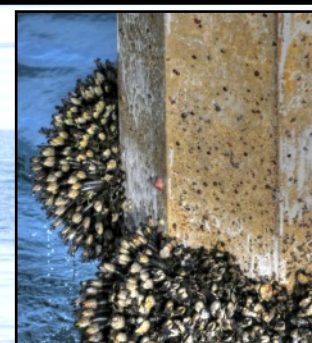
“Yes, I think you’re right.” he replied.



Salmon eggs

HOW THE TIDES BRING LIFE

Have you ever explored rock pools at the seaside when the tide is out? If you look carefully, you will spot different kinds of creatures which live in the pools. Millions of these creatures, including barnacles and other shellfish, and plants such as seaweed, depend on the twice-daily tides to live. Many of these creatures are fixed to the rocks, and really need the tides to bring them food. We also find barnacles stuck to harbour walls and the side of piers (right). They, like rock pool creatures, depend on the tides for food. Without the moon, there would be no tides, no rock pools, nor any of the fascinating creatures which live in the space between high and low tides.



Barnacles on a pier



A rock pool at low tide



Shells and seaweed need the water



The tide comes in again to fill the pools

Using the power of the tides

For hundreds of years people have used the power of the wind, but some are now using the power of the tides to produce electricity, which is much cleaner than using gas or coal. There are several different kinds of tidal generators. Some use the power of the water as the tide flows in and out again. Others use turbines, like one on the right in The Netherlands. Here electricity is made as the blades are turned by the water moving through them. These methods depend on the pull of the moon on the oceans. We really should thank God for our moon!



Photo: Wikipedia Commons

PUZZLE CORNER



1. How many tides are there each day?
2. What makes the highest (spring) tides?
3. What is a “new moon”?
4. What makes an eclipse of the sun?
5. How far is the moon from the earth?
6. How does the moon get its light?
7. When did men first walk on the moon?
8. What are the moon’s monthly changes called?
9. What is the outer part of the sun called?
10. Why do creatures in rock pools need the moon?

The answers are all in this magazine. You can also check them on the back page.

Can you read this Bible verse without using a mirror?

You made the moon to mark the seasons. And the sun always knows when to set.