

# WEIRD AND WONDERFUL

## GLOWWORMS

**H**AVE you ever been outside in the evening after dark and spotted the soft, green light of a glow-worm hanging like a fairy light on a bush or blades of grass? Actually, glow-worms are not worms at all; they are beetles, and it is only the female that has the lighted tail, which she uses to attract a male glow-worm to be her mate. Glow-worms make their light by mixing a chemical called **luciferin** with air.



Evolution can't explain how glow-worms came to be. They could never have discovered how to create luciferin, and then how to mix it with air to produce light. It has taken scientists many years, using their brains, to copy the glow-worm, so these tiny insects could not have done it by accident over thousands or millions of years. Glow-worms reflect the glory of God, their Creator.

The light made by glow-worms is "cold" light, and for many, many years people tried to find a way to copy what glow-worms do. Normal electric light bulbs (below) make a lot of heat as well as light, which is very wasteful. It is only within the last 40 years or so that scientists have discovered how to design and make lights which don't produce waste heat. Yet glow-worms have been doing it all along.



## THIS PALE BLUE DOT

IN 1990 the *Voyager 1* spacecraft took a photograph (below) of the earth from the edge of the solar system, 6.4 billion kilometers (4 billion miles) away. In the book *Cosmos*, astronomer Carl Sagan was thinking about that photo when he wrote, "Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives."



Earth seen from the moon

When seen like that, earth seems very small and unimportant, and it may make us feel unimportant, too. About 2,500 years ago, king David felt that way, when he wrote, "I look at the heavens, which you made with your hands. I see the moon and stars, which you created. But why is man important to you?" (*Psalms* 8: 3-4).

Yet the Bible tells us that this "pale blue dot" is more important to God than all the stars in those billions of galaxies. "God loved the world so much that he gave his only Son... so that whoever believes in him may not be lost but have eternal life. (*John* 3: 16). We have all done wrong things,

but Jesus died and rose again to bring us forgiveness, so that we can live with God for ever. Next time you look at the sky on a clear night, be amazed at its beauty, then remember that the One who created it all loves you!

The pale blue dot is earth, photographed from 6.4 billion km. (4 billion miles) away.

## PUZZLE ANSWERS

It would take over 6,000 years to count the stars in one galaxy!

**BIBLE VERSE:**  
"The heavens tell the glory of God. And the skies announce what his hands have made." (*Psalms* 19: 1)

**ODD STARS:**  
4 — only four points.  
c — only five points.  
v — has a face.  
A2 — missing rays.

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# The WONDER of the STARS

Who can look at the sky on a clear night without feeling a sense of wonder?

How were the stars made?

The Pleiades star cluster

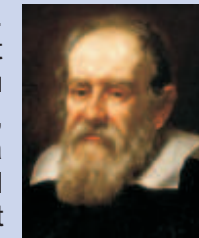


Photo by John Lanoue

Many stars are very beautiful, like the Pleiades star cluster (above). Although many astronomers believe that stars begin with collapsing clouds of gas and dust, no-one has ever seen a star being born. The Bible tells us that after God created the sun and moon, "He also made the stars." (*Genesis* 1: 16), and "It is God who made... the Pleiades." (*Job* 9: 9).

## THOUSANDS OF MILLIONS!

How many stars are there? Can they be counted. Before telescopes were invented people thought they could count the stars. On a clear night you can see no more than about 3,000 stars. Then, in 1609, a man called Galileo (right) used a homemade telescope to look at the stars and saw ten times as many — 30,000 stars. That seemed amazing, but over the years more and more powerful telescopes have been invented, revealing that there are thousands of millions of stars. These telescopes have also proved that what were once thought to be clouds of gas and dust are actually galaxies, each with millions of stars. Our own galaxy — the Milky Way — is thought to contain about 200,000 million stars! How long do you think it would take to count them at one a second without taking a rest? (answer on back page).



The Milky Way

## 'The history book of the universe'

Many astronomers believe that the universe began with an explosion — they call it the "big bang". However, they believe that nothing existed before the "big bang", so they are really saying the universe came from an explosion of nothing! Of course, this is only an idea, since there were no people around to see what happened. But not all astronomers believe in the "big bang". Some believe that everything, including the stars, was created by God, just as we read in the Bible. One of them, Dr Jason Lisle (left), writes: "The Bible is the history book of the universe. It tells us how the universe began and how it came to be the way it is today." God was there in the beginning, so it makes sense to believe what He has told us about how it all began.



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# How telescopes unlocked the secret of the skies



Since telescopes were first invented they have become larger and more powerful, unlocking more of the secrets of the skies. In 1925 astronomer Edwin Hubble (left) discovered that there were other galaxies besides the Milky Way. The beautiful Andromeda Galaxy is one of them. The Hubble Space Telescope (below) was named after him. Astronomers now believe there are at least 50 billion galaxies in the universe, with as many as 300,000 million stars in each of them!



The Andromeda Galaxy



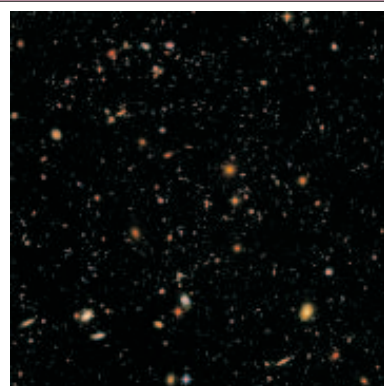
**TELESCOPES OLD AND NEW:**  
A model of a 17th-century telescope designed by Sir Isaac Newton (above left) and a 20th-century Australian radio telescope.

Photo from Wikipedia © CSIRO

## TELESCOPE IN THE SKY



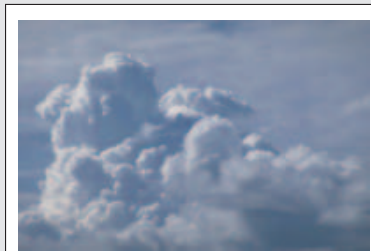
Even with the biggest, most powerful telescopes on earth it's impossible to get a clear view of the stars, because of the earth's atmosphere. The solution was to place a telescope in space where a clearer view of the universe could be seen. On April 24th 1990 the *Hubble Space Telescope* (left) was launched into orbit 589 km. (366 miles) above the earth. It travels around the earth once every 1½ hours. Some of the images from *Hubble* have amazed scientists. The photo on the right shows hundreds of galaxies that no-one had ever seen before — in a part of the sky so small that a grain of sand held between your thumb and finger would cover it!



This Hubble photo covers a part of sky no larger than a grain of sand held between your finger and thumb!

## Nature Notes by the Editor

Looking at the stars is fascinating, but clouds are very interesting, too. If you watch the sky you will find that the cloud shapes and patterns are always changing, and there are many different kinds of cloud. Before modern weather forecasting began, people could often forecast the weather by watching the clouds. It's not difficult to spot storm clouds, which build up before heavy rain, but there are also "fair-weather clouds" — those fluffy white clouds which drift lazily across the sky in fine weather. A cloud with a herringbone usually means wet weather, which explains the saying "A mackerel sky never holds three days dry." Weather forecasters have special names for clouds, and it's worth learning more about them.



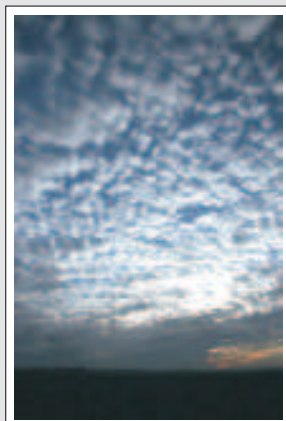
Storm clouds building up



"Fair-weather" clouds

Without clouds there would be no rain. The sun's heat evaporates water from the earth and oceans to make clouds, then they release it back to earth as rain. We call this the "water cycle." We should thank God for the clouds, and the wonderful system He created to keep our world supplied with water.

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A "mackerel sky"

—Geoff Chapman

## FAMOUS ASTRONOMERS SAW EVIDENCE OF GOD



Johannes Kepler  
1561-1630



Sir Isaac Newton  
1643-1727



William Herschell  
1738-1822

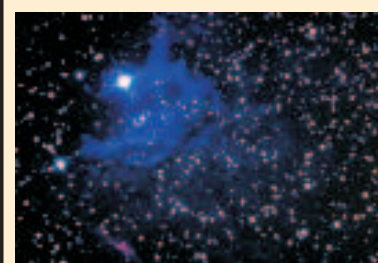
**Johannes Kepler** believed that God had created the world according to a plan that people could understand by using their minds. **Sir Isaac Newton**, who discovered the Law of Gravity, has been called "our greatest scientist." He studied the Bible more than science, and believed that the people who wrote it were inspired by God, the Creator. **William Herschell** believed the stars proved there was a God. TV astronomer Patrick Moore said Herschell was "the best telescope-maker of his time, and possibly the greatest observer who ever lived".

### No Future in the stars!

It is important not to confuse *astronomy* with *astrology*. Astronomy is the study of the stars and planets; astrology is the strange, unscientific belief that the stars can affect our lives and guide our future. Most newspapers print "horoscopes" which many people read, hoping to get help and guidance. However, the stars are much too far away to affect us, and the horoscopes are often completely wrong. Astrology can open people's lives to evil, too.

How much wiser to look to the God who **created** the stars to guide us! The writer of Psalm 121 got it right: "My help comes from the Lord. He made heaven and earth."

### God counts and names all the stars!



For thousands of years people have been studying the stars. Long before the invention of telescopes, the writer of Psalm 147 wrote about the greatness of God: "He counts the stars and names each one. Our God is great and very powerful." (verses 4-5). The prophet Isaiah also wrote: "He calls all the stars by name." (Isaiah 40: 26). They had no idea how many stars there were, but they believed the stars showed

God's power, and that the One who created the stars cared for them, too. Now that we know so much more about the universe, it should be easier to believe in God. If you look at the night sky - with or without a telescope - please remember that the God who created and named all those millions of stars also knows and loves you, and that you matter much more to Him than they!



## PUZZLE CORNER

Decipher the Bible verse using the keyboard below

5 16 3	16 3 11 24 3 26 12	5 3 19 19	5 16 3	15 19 9 4 6	9 14
15 9 13 29	11 26 13	5 16 3	12 18 8 3 12	11 26 26 9 7 26 23 3	
2 16 11 5	16 8 12	16 11 26 13 12	16 11 24 3	27 11 13 3	

Q 1	W 2	E 3	R 4	T 5	Y 6	U 7	I 8	O 9	P 10
A 11	S 12	D 13	F 14	G 15	H 16	J 17	K 18	L 19	; 20
Z 21	X 22	C 23	V 24	B 25	N 26	M 27	' 28	· 29	? 30

BELOW: SPOT THE ODD STAR OUT IN EACH ROW

1 2 3 4 5

A B C D E

V W X Y Z

A1 A2 A3 A4 A5

(answers on next page)