RD AND WONDERF

The Petrel

DETRELS are sea birds that spend most of their time flying over water feeding on fish, which they catch by skimming near the surface. There are about 100 species of petrel, including some that live in the antarctic.

Most interesting is the Black-rumped Petrel, which nests on the island of Hawaii. This bird actually builds its nest at the top of Mount Haleakala, 3,000 metres (10,000 feet) above sea-level. This is higher than any other seabird nest, and could cause serious problems. Eggs have tiny breathing holes in the shell to allow oxygen to go in and moisture to escape. Since the air is very thin at this height, we would not expect the chick inside the egg to survive.



Mount Haleakala in Hawaii. Blackrumped petrels nest on this mountain, 3,000 m. (10,000 ft.) above sea level.

However, petrels' eggs have fewer holes than other birds' eggs just right to allow the chick to breathe safely. even though the chick takes 55 days to hatch.

Petrels only lay one egg, but even feeding one growing chick with fish would be too much for the parents, with the nest so high and



far from the sea. What is worse, the baby stays in the nest for 4 months! But all is well, for the birds have a special way of providing extra nourishment to their chick. While they are at sea catching fish, their bodies produce a special rich oil in their stomachs, which they then take back to feed to the chick!

The petrels which nest on that high mountain have managed to survive because they were specially designed for it. With only one egg to hatch, they couldn't have slowly evolved all these abilities. Their eggs must have already had less breathing holes than other birds' eggs, and they must have already had the means to make that special oil to feed the growing chick. These facts tell us they must have been created by God.

WILL YOU BE BUSY FOR YOUR KI

In this paper we have been learning about bees, and how wonderfully they work together making honey, feeding their young, and serving their queen. However, the bees don't do this by choice, but by instinct. They are programmed to do it. God could have programmed us to live the way He wants us to, but He gave us the freedom to choose, and we have all made the wrong choice and sinned against God.

In the beginning, God created all things to work together, and also with Him. Then Adam and Eve sinned, and bad things began to happen. Now, people often can't live in peace together, and this sometimes leads to wars and fighting. God is sad about this, and wants us all to live happily together.

Because He loves us so much, God has acted to help us. He came to us in the Person of Jesus to show us how we ought to live. Then He died on the cross for us so that our sins could be forgiven, and rose from the dead so that His Spirit could live in us and help us live His way. believe in his Son, and that we love each other." (1 John 3: 23). When we put our we become part of God's family called busily helping to build His Kingdom, just the Church. Then we can all work as the bees work together in the hive?



together to serve our King, just as the bees work together for their queen. They do it because they have to; Christians do it because they love God and others. This is the only way the world can "This is what God commands: that we become a happier, safer place, and all over the world Christians are working to help others. Have you made Jesus your faith in Jesus and make Him our Lord, King? And will you serve Him faithfully,

PUZZLE CORNER ANSWERS

(Psalm 19: 10). even the finest honey." "They are sweeter than honey,

BIBLE VERSE:

10. Kiwi. 7. Melon. 8. Mango. 9. Olive. 4. Pear. 5. Orange. 6. Peach. 1. Lemon. 2. Banana. 3. Apple.

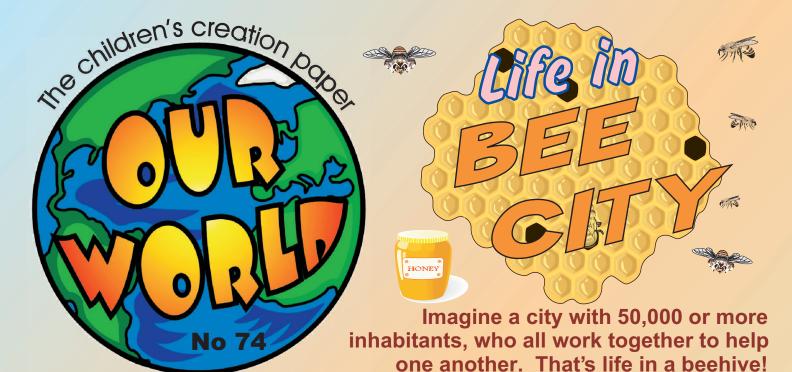
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A swarm of bees

Wild bees build their own nests, but for centuries humans have kept bees, and provided them with special hives where they make their honey. A hive is like a city where everyone works together to serve the queen. It all begins at the beginning of summer when bees "swarm". Thousands of bees will find a queen, and cling to one another in a huge bunch. Beekeepers often collect swarms and put them into a hive, but if not, the bees will



find a place to make their nest. The worker bees then get busy making a honeycomb out of wax, which they produce from their bodies (see inside for more about the

The queen bee is little more than an egg-laying machine. The eggs are laid in the cells of the honeycomb and sealed in. Three days later they hatch, and "nurse" bees feed the grubs, starting with special food called "royal jelly" and "bee bread". At five days old, the grub spins a cocoon, and 16 days later an adult bee chews its way out. It begins to work at once, without ever having been taught! The queen, who lays all the eggs, never works, so how do the worker bees know what to do? Bees must have been "programmed" by God to live and work together — and to help us.

BEES HELP US ALL

Did you know that bees, small as they are, make life better for all of us? Not only do they provide us with honey, which is a very healthy food, they also take pollen from one from flower to

another. Without this, many plants could not produce fruit. Although other insects also do this, bees do most of the pollination, and farmers

sometimes put hives of bees in their fields. When you next enjoy a crunchy apple, remember, it's thanks to the bees - and to God, who created them to help provide us with good food.



small spaces

the honeycomb

ALSO IN THIS ISSUE: BEE FACTS. TINY ENGINEERS. NATURE NOTES: HELPFUL INSECTS. WHY BEES DANCE. PUZZLE CORNER. WEIRD AND WONDERFUL: THE PETREL.

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DO YOU KNOW THESE BEE FACTS?



A queen bee can lay 1,200 eggs a day, and 200.000 in a year!

In a five-year life she will lay a million

Honeybees beat their wings 11,400 times a minute: that's what makes them buzz". Bees visit 50-100 flowers in one trip Bees have to fly 55,000 miles to get the nectar for 500 gms. (1 pound) of honey. In each hive, there are three kinds of bee — the queen, female workers and male

The gueen hatches from the same kind of egg as other females.

The workers "create" a queen by feeding one grub differently than the other females.

TINY ENGINEERS

The six-sided pattern of a honeycomb is perfect for strength and uses less material than any other pattern. Human engineers could not do better! So how did the bees learn?



Worker bees attending the queen in a special large cell of the honevcomb

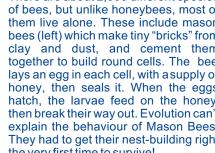
Bees save even more material by building the cells back-to-back, and staggered, so that the dip at the bottom does not use extra wax (see diagram on the left). The cells are also tilted upwards to prevent the contents spilling out.

A honeybee's brain is no larger than a pin-head, so they can't possibly think about and plan all they do. They can't learn it either — they begin work as soon as they hatch. The oldest fossil bees (found in amber) show they have not changed at all. Honeybees must have been created by God; they could not have evolved.



Drawing by Brian Newton

BEES THAT LIVE ALONE There are about 2,000 different species of bees, but unlike honeybees, most of them live alone. These include mason bees (left) which make tiny "bricks" from clay and dust, and cement them together to build round cells. The bee lays an egg in each cell, with a supply of honey, then seals it. When the eggs hatch, the larvae feed on the honey, then break their way out. Evolution can't explain the behaviour of Mason Bees. They had to get their nest-building right the very first time to survive!



Nature Notes by the Editor



A Hoverfly is the gardener's friend. It eats aphids which damage plants

many do a lot of good. Many gardeners welcome some insects because they help to get rid of real pests without using harmful chemicals. One of these

is the hoverfly, which looks like a small wasp. Hoverflies eat aphids, which damage plants, so good gardeners plant flowers which hoverflies like, such as marigolds. Ladybirds are also welcome. They eat aphids and other pests.

Many people don't like centipedes, with their many legs, but they are a gardener's friend, too, because they eat slugs. Some insects do unpleasant jobs. One is the burying beetle, which acts as nature's undertaker. It buries the bodies of

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dead animals, then feeds on them – a very useful job.

When God created the world "it was very good" (Genesis 1: 31), and there were no harmful creatures. This all changed when Adam and Eve sinned, but we can be thankful that even now there are creatures which God has provided to help us and work with us. —Geoff Chapman

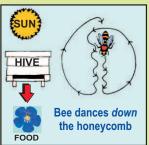


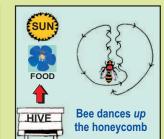
Nature's undertaker: Burying Beetles bury dead animals

BUSY BEES WORK AND DANCE

Bees gather nectar from flowers by sucking it through their long, hollow tongue. It is then stored in a special second stomach, and, while the bee flies around, chemicals are added that will turn the nectar into honey. Back at the hive, the nectar is put into storage cells. Other cells are used to store pollen, which is collected from flowers and carried in special "pollen baskets" on the bees' back legs.. Pollen is made into "bee-bread", to feed young bees, and mixed with nectar to make a special rich food called "royal jelly.". Honey and nectar are used as food for the workers, and to make bees-wax to build more cells. When bee-keepers take the honey from a hive they have to provide syrup to feed the bees during the winter. Humans use bee pollen as a high-energy food supplement, and beeswax for furniture polish.







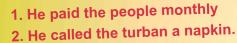
If the scout bee dances down the side of the honevcomb (above left) she is telling the other bees to fly away from the sun. If she flies up (above right) she is telling them to fly towards the sun. She tells them how far away the food is by the speed of her dance, and dances at an angle if they have to fly to the left or to the right. The scout also tells the other bees how much food they will find by the way she waggles her body. If there is only a little, only a few bees will go.

Before bees can gather nectar and pollen they have to know where to find it, and the way they do this is truly amazing. First of all, "scouts" leave the hive to search for suitable flowers. They have a tiny magnet in their bodies to help them navigate - rather like a "microchip". Having found the food, they return to "tell" the other bees where to go, and how far it is. How do they

do this? By dancing! (see box on the left). Surely all this didn't happen by accident? And it couldn't have evolved aradually. Honeybees must have been created by God to do these amazing things from the beginning.



MOST people don't like creepy-crawlies of any kind, but did you know that many of these bugs are really our friends? That's right, they're not all pests, and



- 3. I've sat on your lap plenty of times.
- 4. She wrapped the cape around her head.
- 5. I also ran gently along the path.
- 6. The teacher tried to help each child. 7. I bought myself some long socks.
- 8. The man gobbled down his lunch.
- 9. I would love to live in the country.
- 10. If you're quick, I will come with you.

(ANSWERS ON BACK PAGE)

PUZZLE CORNER

BIBLE VERSE QUIZ

Take the first letter of each object to spell a verse from the Bible. The answer tells us what king David thought of God's teachings





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