

1.



D.Fugitt/UNEP/Topham

You can find them in myriad shapes, from mushrooms to moose antlers, cabbages to table tops, wire strands to wrinkled brains. There are almost a thousand species of coral, making up reefs that are the most diverse habitats in the oceans. Four thousand fish species depend on them, and they are economically as well as ecologically important, providing about a quarter of the fish catch in Asia and attracting tourists. More than 10 million people visit Australia's *GREAT BARRIER REEF* each year, for example. Yet 70 per cent of the world's reefs have already been destroyed or are threatened by pollution, overfishing and coastal development. Global warming presents an even greater danger, as corals are highly vulnerable to changes in water temperature.

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The oldest living thing on Earth is a tree called Methuselah. More specifically, it is a *BRISTLECONE PINE*, living high in the harsh environment of California's White Mountains. At almost 4,800 years old, it is as ancient as the pyramids, and several other trees in the area have survived more than four millennia. Yet they have done very well in extremely poor soil, at an altitude of 3,000-3,500 metres, in a place where the level of moisture in the air on a summer's day is the lowest found anywhere on Earth. That is part of the secret of their success: by adapting to grow where no other trees can, they have remained free of competition. Their needles live for two or three decades, and even the oldest of the pines can produce cones with viable seeds.

2.



John Finneran/UNEP/Topfoto

4.

*THE ROSY PERIWINKLE*, a pretty but ordinary-looking plant from Madagascar, has saved countless lives. Traditional healers used it to treat diabetes, and when modern scientists started investigating, they found, almost by chance, that it contained two vital cancer-fighting substances. Vincristine, for example, has helped increase the chance of children surviving leukemia from 10 to 95 per cent. And

3.



Topham/UNEP

They seem like the most inhospitable environments on Earth, yet they teem with life. *HYDROTHERMAL VENTS* deep in the world's oceans spew out super-hot water, which is rich in minerals but often extremely toxic. Giant tube worms, huge clams and eyeless shrimps, among other species, have adapted to live there, creating thriving communities on the otherwise barren ocean floor. First discovered in 1977, the vents have revolutionized views of life. Until then, it was thought that no life could exist without sunlight, which penetrates only about 100 metres down; most vents are about 2,000 metres beneath the surface. Now scientists believe that it may have been at sites like these that life on Earth first began.



TopFoto

# WONDERS

5.



Norbert Wu

The Norwegians thought they were mermen; Jules Verne described a battle with one in his classic *20,000 Leagues Under the Sea*. Tales were told about the **GIANT SQUID** for centuries, fuelled by occasional dead specimens washed up on land. The biggest, found in New Zealand in 1887, was over 16 metres long. Scars on captured sperm whales showed that the two giants fought titanic underwater battles. Then, two years ago, Japanese researchers photographed a giant squid in the wild, deep in the Pacific, for the first time. But by then it had already been surpassed: the year before, an even bigger, meaner species – the colossal squid – had been recovered from the Antarctic.

vinblastine is often used to treat Hodgkin's disease. Worldwide sales top \$75 million a year, but little of this money has found its way back to Madagascar, one of the world's poorest countries. Now international agreements are trying to ensure that more of the profits from the many plant and animal species that have provided great benefits to medicine and agriculture return to their countries of origin.



6.



Martin Harvey

Many of the world's richest spots for biodiversity were refuges from the ice ages that gripped Earth between 2.4 million and 10,000 years ago. These dramatically altered habitats across the planet: much of its tropical forests turned to savannah, for example. Animal and plant species survived – and evolved separately – in these isolated '**REFUGIA**'. When the ice retreated, they moved out to colonize the planet again. Many refugia are in tropical forests and host a vast array of mammals, birds, reptiles, insects and plants, but they are also found elsewhere. In Australia, the temperate Blue Mountains turned to sand dunes, but the ancient Wollemi pine survived in strongholds in damp valleys. Perhaps more surprisingly, some parts of the North American Arctic remained ice-free, providing refuges for the species that now dominate the continent.

Rice has been cultivated for 10,000 years, and it now feeds almost half of humanity. But in the last decades, it has been transformed by the development of 'miracle' strains at the International Rice Research Institute in the Philippines. The most widespread, code-named **IR36**, was developed from two mutated seeds found in Uttar Pradesh, India. Highly resistant to many pests and diseases, it also matures much faster than traditional varieties. It and other new varieties developed at the Institute have more than doubled rice production, feeding an extra 700 million people. These varieties are grown across 70 per cent of the world's rice fields. This has its own dangers, however, as large expanses of the same variety of any crop are vulnerable to any disease or pest that evolves to threaten it.



T. Revter/UNEP/Topham

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