



# Vertical park rises into the sky

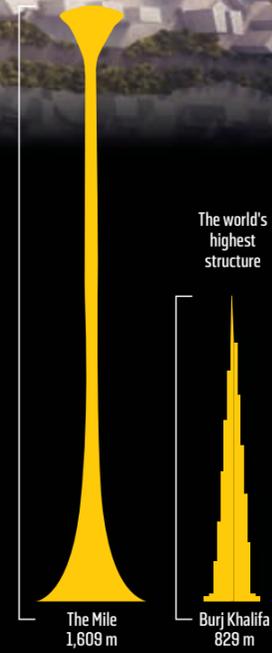
If it is built, architect Carlo Ratti's new tower will beat all altitude records. The vertical park with animals and plants includes an observation deck at the top.

**TECHNOLOGY** 828-m-tall Burj Khalifa in Dubai is the world's highest manmade structure, but in comparison with the Mile, which is developed by international design and innovation office Carlo Ratti Associati, the spectacular skyscraper is going to lose out. As implied by its name, the Mile will be one mile – 1,609 m – tall, and so, the tower rises almost twice as high as Burj Khalifa.

The Mile is still only a drawing board vision, but according to plan, the structure is going to be a green city oasis full of animals and plants. At the top, there will be an observation

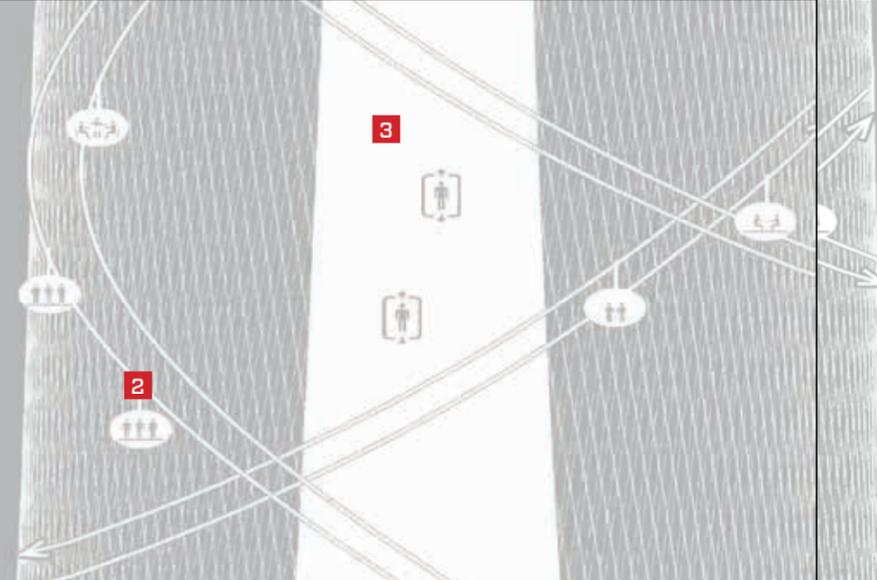
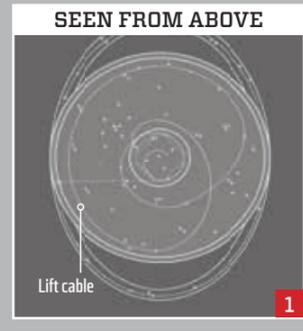
deck with interactive glass walls. The tower itself is going to be spectacular with its park-like appearance, and going to the top will be a very special experience – for people, who are not afraid of heights.

Instead of riding an ordinary lift, the visitors will enter a capsule, which orbits the tower all the way to the top. Going up, you will be able to view the central shaft of the tower, which is also a vertical park. Animals and plants will thrive in and on the latticework of the building, which is envisioned to feature different ecosystems at different altitudes.



## Vertical park

Architect Carlo Ratti designed the Mile, which will function as a vertical park with space for humans, plants, and animals.



**1** The lifts operate on cables, which wind around the structure in different patterns.

**2** Passenger capsules designed as conference rooms, spas, restaurants, etc., will orbit the tower, taking visitors up and down stage by stage.

**3** The capsules work in the same way as ski lifts, and according to plan, several will be orbiting the tower in different paths. Some are designed as conference rooms or restaurants, whereas others are spas or include a swimming pool.

## Buried with turtles

**ARCHAEOLOGY** In an approximately 2,500-year-old grave by the Tigris river in south-eastern Turkey, archaeologists have made a very remarkable discovery. The Iron Age grave contained the skeletons of a woman and a child, who were accompanied by no less than 21 turtles.

The three different species of turtles had evidently been slaughtered, as they had cut marks on their shields and bones.

In the Middle East, turtles are traditionally linked with life after death, and that may be the reason why the reptiles ended up in the grave. 17 of them were Euphrates softshell turtles – an aggressive species which is known to be carnivorous. In early Middle Eastern cultures, they were considered sacred.

The turtles may also have been eaten in connection with a burial ritual.

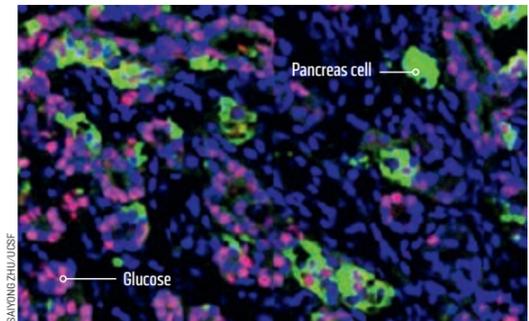


The bodies of a woman and a child were buried with turtles.

## GORILLAS HUM AS THEY EAT

Just like people say yummy, when we get a delicious meal, gorillas and particularly adult male gorillas surprisingly tend to hum, as they eat, according to recent scientific research carried out in the West African republic of Congo, where scientists have recorded the large monkeys' different sounds of singing.

**> 46** substances provide Parmesan cheese with its characteristic taste. The salty taste is due to sodium, potassium, and chloride ions.



Pancreas cells created from skin cells (green) are breaking down sugar (purple).

## Skin cells produce insulin to fight diabetes

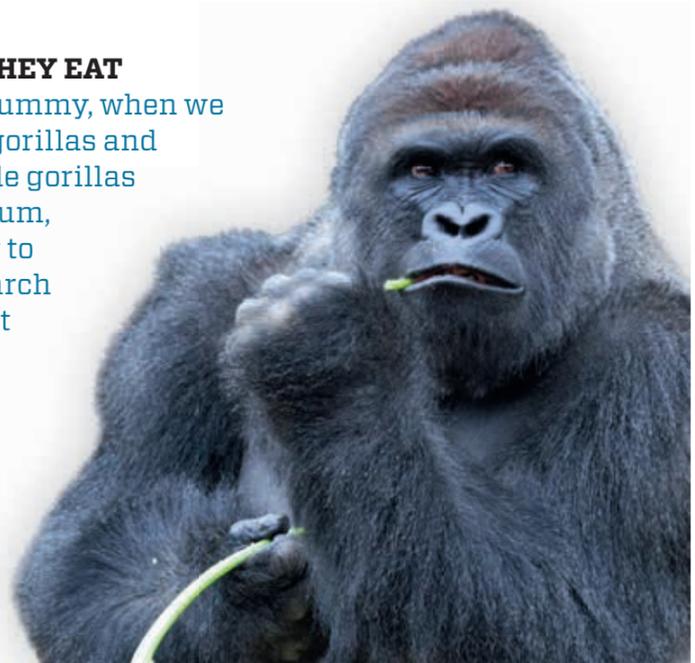
**MEDICINE** Scientists from the Gladstone Institutes and the University of California in the US have managed to turn skin cells from humans into pancreas cells that produce insulin.

The new method, which paves the way for efficient diabetes treatment, is already used. More than 1,000 people have gone through insulin producing cell transplants, but so far, the cells have been taken from the pancreases of dead donors.

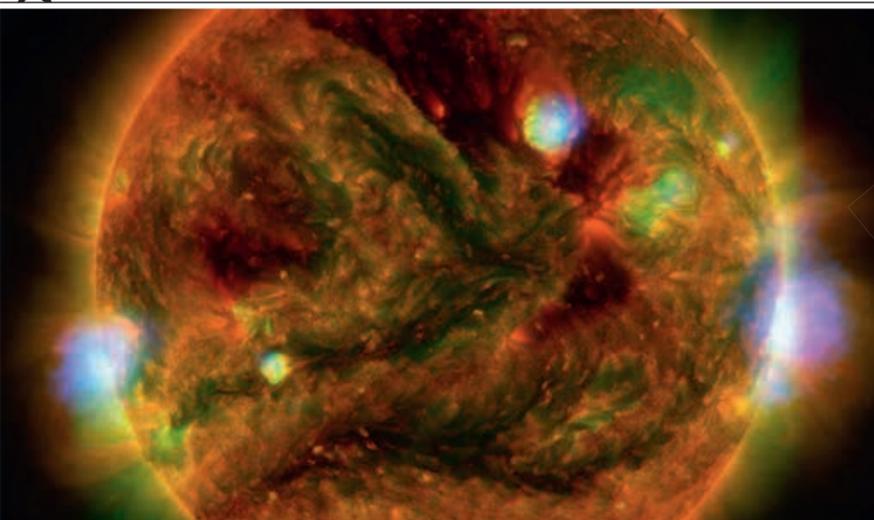
By converting skin cells into pancreas cells, doctors can produce an unlimited number of cells, and so, far more patients can benefit from the treatment.

**> ENCYCLOPEDIA**

**Insulin** is one of the most important hormones of the human body. It helps convert the food that we eat into body energy.



SHOOTING STAR – the Sun



Telescope takes X-ray photos of the Sun's corona

The Sun's corona is warmer than its surface, but according to thermodynamics laws, that should not be possible. However, scientists suspect that the phenomenon is due to nanoeruptions, so they have aimed the NuSTAR X-ray telescope at our star to take a closer look at the eruptions.

NASA/JAXA

130 million

times more intense than sunlight was the light detected by the Kepler telescope from two stars exploding into a supernova.

Sea sponge was the world's first animal

**BIOLOGY** The first animal on Earth was probably a sea sponge, according to genetic analyses made by scientists from the Massachusetts Institute of Technology (MIT). In 640-billion-year-old rock, scientists found

special molecules that turned out to originate from prehistoric sea sponges.

Known as 24-isopropyl cholestane, the molecules are also produced by a specific type of algae, but the scientists managed

to prove that the algae acquired the ability to produce the molecules at a later point in time, and consequently, they must come from the sea sponges.

So far, scientists have based their work on the theory that the first animals on our planet originated some 540 million years ago in an event known as the Cambrian explosion.

SEA SPONGES

- **Cells:** Sea sponges are multicellular organisms living on subsea rocks.
- **Bath sponge:** Dried sea sponge skeletons are used as bath sponges.
- **Food:** The sponges feed on organic matter in the water.



Scientists found evidence that sea sponges existed 640 million years ago, meaning that they are the world's oldest animals.

BY THE WAY!



NEWS FLASH!

A capsule of faeces can cure lethal bacterial infections. The faeces needs not be fresh – frozen faeces is just as efficient, according to new research.

And talking of faeces ...

Most of your faeces – no less than 75% – is water. The rest is a mixture of living and dead bacteria, fibres, fats, salts, cells, and protein, producing the characteristic bad smell.

As the faeces reaches the colon, it encounters bile, which is a liquid produced in the liver. The bile includes bilirubin, which is the pigment mainly responsible for the brown colour of faeces.

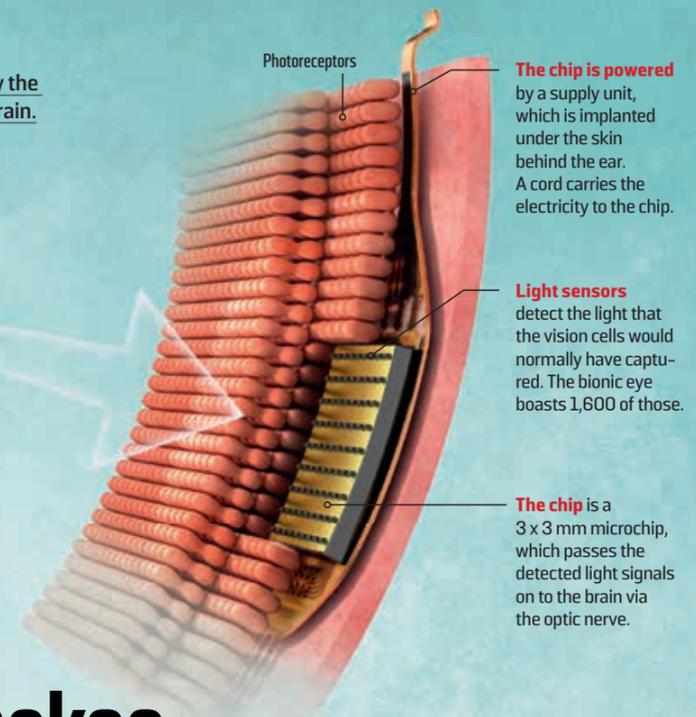
The world's most expensive and exclusive coffee beans are Kopi Luwak beans, which are named after the luwak civet. The beans have been on a long journey through the civet, returning with its faeces.

Chip captures light

A small, implanted chip converts the light captured by the eye into electric signals, which are passed on to the brain.



The retina is the innermost layer of the eye, where the chip is implanted. It is placed among the photoreceptors to replace the devastated visual cells.



The chip is powered by a supply unit, which is implanted under the skin behind the ear. A cord carries the electricity to the chip.

Light sensors detect the light that the vision cells would normally have captured. The bionic eye boasts 1,600 of those.

The chip is a 3 x 3 mm microchip, which passes the detected light signals on to the brain via the optic nerve.

Artificial eye makes blind woman see again

After getting an implant in her right eye, a British woman, Rhian Lewis, has recovered some of her eyesight.

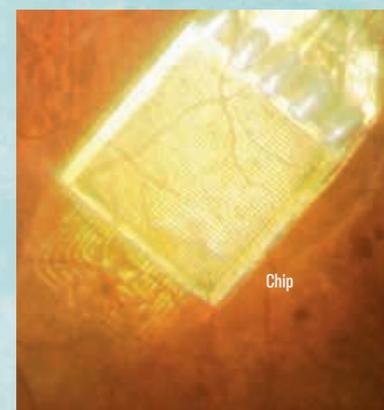
**MEDICINE** For almost six years, Rhian Lewis was unable to see what time it was – or anything else for that matter. But after having gone through ground-breaking eye surgery at the John Radcliffe Hospital in Oxford, the British woman has regained her vision.

Her eyesight is far from perfect, but just being able to make out the surroundings is like a miracle to Rhian Lewis, who suffers from an incurable eye disease, retinitis pigmentosa, by which the visual cells of the retina are

destroyed, making her gradually blind. Before the surgery, Rhian Lewis could see a little bit with her left eye, and that was it.

The British woman had a microchip, a bionic eye, implanted at the back of her right eye. The chip replaces the devastated visual cells and is powered by a small supply unit located under the skin behind the ear.

After a few weeks, Rhian Lewis' brain had learned to interpret the signals from the chip and convert them into meaningful shapes.



The small chip is located at the back of the retina, where it captures light signals.

UNIVERSITY OF OXFORD, CLAUS LUNAU

MONITOR FOUND ON REMOTE ISLAND

On Mussau, Papua New Guinea, an unknown monitor lizard measuring 1+ m has been discovered. The creature is one of the island's top predators, feasting on crabs, birds, other reptiles, eggs, etc.

WALTER MEJDLA & ABO AKUDEM

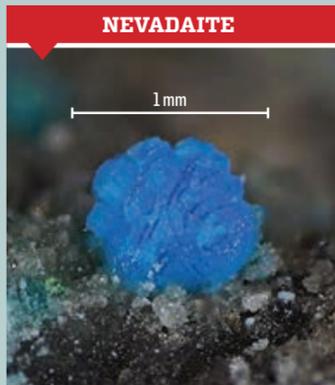


## Rare minerals make Earth unique

**GEOLOGY** Scientists from the US Rockefeller University and Carnegie Institution have proved that Earth is indeed very unique. They have created a database which demonstrates that more than half of the some 5,000 minerals existing on our planet are extremely rare, that is rarer than diamonds.

Approximately 2,500 super rare minerals exist in no more than five places on Earth, and some only exist in one place, such as fingerite, which only exists on a volcano in El Salvador. In overall terms, several of the rare minerals take up the space of less than 1 cm<sup>3</sup>, i.e. less than a lump of sugar.

According to scientists, Earth is mineralogically much more complex than other Solar System planets and moons, and many of the minerals can only form in places that include life.



■ This mineral has only been found in **two places on Earth**: in a gold mine in Nevada, USA, and in a copper mine in Kyrgyzstan. The mineral includes the vanadium element.



■ The rarest mineral has only been discovered once **in a Sardinian mine**. It is made up of the elements of thorium, which is radioactive, and molybdenum.

ROBERT DOWNS/ UNIVERSITY OF ARIZONA, PAOLO BAGGI/ETAL



## STONE AGE PEOPLE MADE MYSTERIOUS CHARM

In Yorkshire, England, archaeologists have excavated an 11,000-year-old charm made of slate. The charm is engraved with short and long lines that may represent a tree, a map, a leaf, or a number. The owner was among the first people to arrive to England after the glacial period.

NICKY MILLER/ UNIVERSITY OF YORK

80 %

of the Neanderthals' diet consisted of meat, according to a comparison of their bones and those of contemporary animals.

## ZOOM – Cuckoo or owl?



### Genes make the eggs blue

Norwegian scientists have discovered that the blue colour of this bird's eggs is due to genes from the mother, which are inherited by the offspring. The blue colour and the shape disguise the freshly laid eggs, which are placed in the nests of other birds.

ALAMY/IMAGESLELECT

SEE THE ANSWER ON PAGE 80

» All birds descend from a common ancestor, which lived in South Africa 95 million years ago.



If a laser beam is pointed at Vantablack, it disappears almost completely.

## Scientists make the blackest material

**TECHNOLOGY** In a laboratory, the British company Surrey Nano-Systems has managed to create the darkest version of the colour black.

Named Vantablack, the colour absorbs 99.96 % of the light that hits it. Vantablack consists of a nanotube surface resembling a forest. The light is reflected between the nanotubes, and instead of leaving the surface again, it is captured. In the end, the light is converted into heat, which can escape.

The pitch-black material can particularly be employed in space exploration. By keeping out unwanted light, it will be easier for telescopes – both those on Earth and those in space – to focus on the weak light, which comes from afar. In other words: the blacker, the further they can "look".

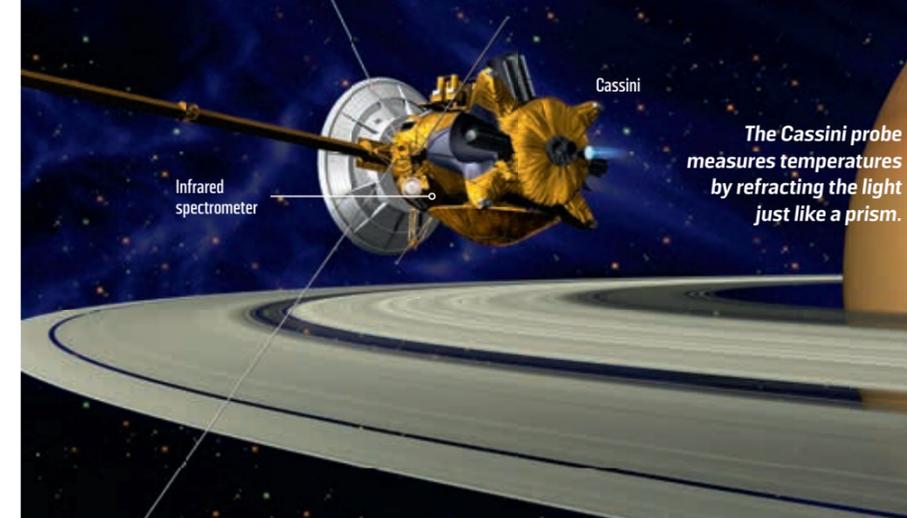
### NEWS FLASH!

#### Genes determine your sleep

Your genes determine whether you are a night owl or an early bird, according to a scientific project including 90,000 people. The study demonstrates that 15 particular genes determine if you are an A- or a B-person.

# Cassini has measured the temperature of Titan

Using a spectrometer, the NASA probe has recorded the temperature differences of the second largest moon in our Solar System.



The Cassini probe measures temperatures by refracting the light just like a prism.

**ASTRONOMY** Over the past 12 years, the NASA space probe Cassini has regularly measured the temperature of Titan, Saturn's largest moon and the second largest moon of the entire Solar System. According to the probe's diagnosis of the distant moon with the dense atmosphere, the patient is very cold.

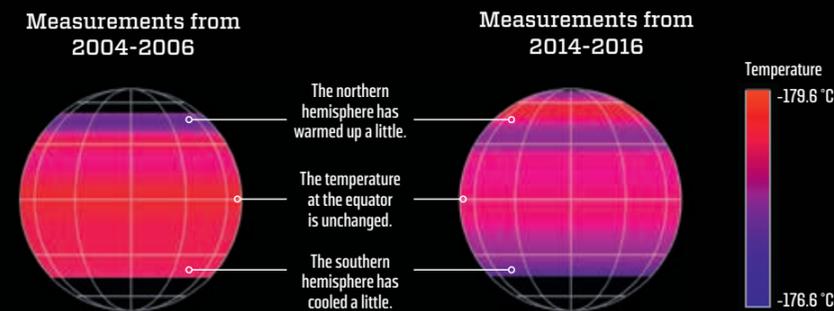
The measurements have been made using Cassini's infrared spectrometer, Composite Infrared Spectrometer, and they have been going on,

since the probe started to orbit Saturn in 2004. At two year intervals, the probe has registered the heat radiation all the way across Titan's surface and mapped out, how temperatures change with the seasons, which last 7.5 years each.

The highest temperature ever measured is minus 179.6 °C, whereas the lowest is only three degrees lower. In comparison, the difference between the warmest and coldest temperatures on our own planet can easily be 100+ °C.

## Looking through the atmosphere

Cassini's infrared spectrometer measures the heat radiation emitted at a wavelength of 19 microns. In this way, it is able to "see" the seasonal temperature differences on Titan, where a season lasts 7.5 years.



NASA