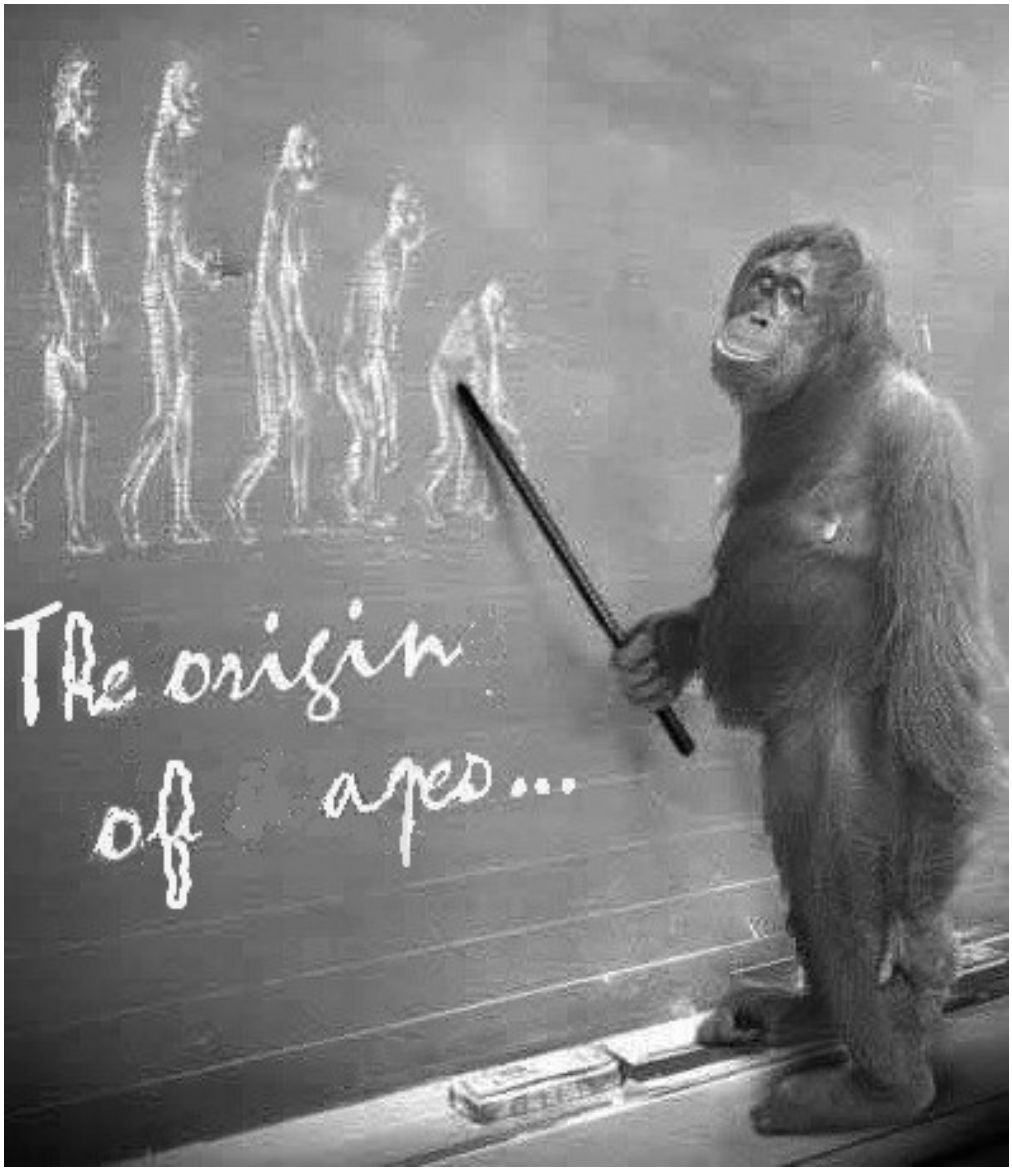
CANS OF JAM²



Cans of jam² is a scientific magazine written by the pupils from the European classes of Paul Langevin High School in Beauvais. It is free, available mainly through internet, and usually published for each school holiday period.

If you want to subscribe and receive an internet copy of *cans of jam²*, all you need to do is send an email entitled '*cans of jam²*, subscription' to didier.galard@ac-amiens.fr, and you will be added to our mailing lists. And that is free as well!!

From the editors

Welcome back to *cans of jam²*!
It has seemed a long long time since our last issue, and a very tiring time too, for teachers as well as for pupils : they were not so many to prepare an article this time... But some of them did their job very seriously, so we hope their articles will please you.
One of you at least should be happy, since Stephen Jay Gould will be our second 'scientist who counted', and not only because of his science, but also as a human; so, Julie, what do you say? Are you happy?
You will also learn some more about Titan, another remarkable satellite in our solar system; and for those of you who are astronomically-minded, we hope you enjoy watching Jupiter and Venus every night at the moment in the south and south-west sky; if you have not, hurry up, there is still time!
And finally, there is also an article about crap. You know, the s- word. But serious.
So, enjoy it while it lasts, and send us your ideas and opinions!
Bye for now,

Willy B. and Didier G.

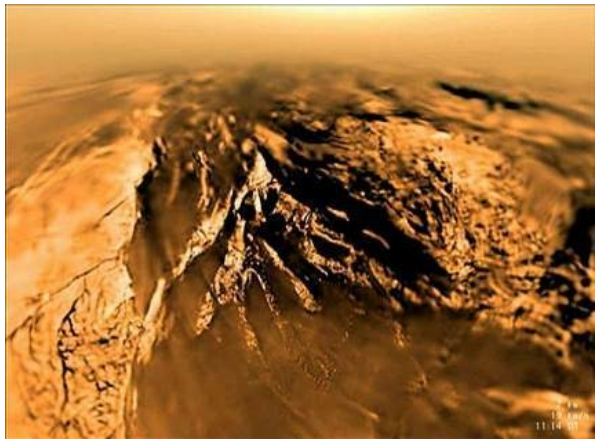
Titan

by Alexis G.

A satellite of Saturn, Titan is the biggest satellite of the solar system after Ganymède. With 5,150 km in diameter, it is even bigger than Mercury and Pluto. It is also the only moon with an atmosphere and a cloud layer which is denser than the Earth or Mars.

It was discovered in 1655 by the Dutch astronomer and physicist Christiaan Huygens, but it really became interesting to planetologists and astronomers in November, 1980, when the probe Traveler I passed less than 6,500 km from it.

They had the surprise to discover an atmosphere with about 90 % of nitrogen, approximately 10 % of methane, 0.2 % of hydrogen, and traces of hydrocarbons such as ethane, acetylene, ethylene or methyl, but also organic nitrogenous compounds such as hydrocyanic acid, cyanogen (= carbon nitride) and cyanoacetylene, which are the first bricks on which life is built!

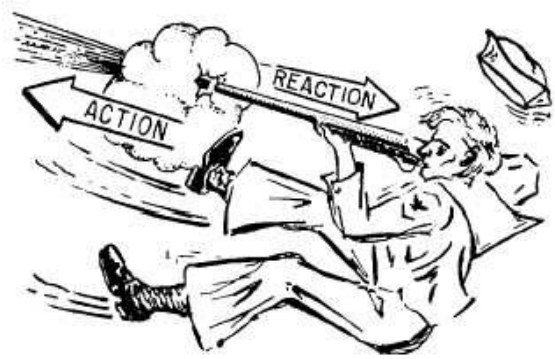


Newton's third law of motion

by Josias N.

One day, I was fighting, when I suddenly realized that every time I pushed my opponent, I also went backward... And yes, I know it is bad to fight, but I wondered why I went backward too...

Then one day, I was watching TV; it was a programme that my younger brother often watched, called 'Prove it', and I learned that there was a law to explain it : this was Newton's third law of motion.



This law tells us that 'the mutual forces of action and reaction between two bodies are equal, opposite and collinear' which means that if you push someone, he pushes you too; but which means also that the people used my strength against me ??? So I do not fight anymore.

Scientists' Olympic games

by Jean C.C.

To explore the different ways of locomotion of cells, three researchers from the CEA and the Curie Institute initiated a curious challenge to other laboratories all around the world: they organized… A race of cells! More than fifty labs accepted the challenge.

Deposited on plates with furrows dug into them, the 'athletes' had 24 hours to travel the long runway of less than half a millimeter! The result? The race was won by a bone marrow cell provided by the University of Singapore, which was the fastest with an impressive speed of 0.000000312 km per hour, or 3.12×10^{-7} km/h...

Australia saved by bugs

By Orphélia R.

In ancient Egypt , beetles were associated to the god Khepri, who rolled the sun above the Earth every morning just as the beetle rolls its ball of droppings.

Indeed, dung beetles are cleaners. There are more than 5,000 known dung beetle species, which are divided into three categories.

First, there are the sedentary beetles, which live everywhere there is dung. Then, the tunneling beetles, which bury their balls of dung and dig galleries below. And, finally, the most advanced : the ones which roll and carry their balls of dung with them to eat them and lay eggs in them.

If dung beetles did not exist, we would be buried under dung. Indeed, they clean the surface of the planet, recycling so well that they are involved in soil fertility. By destroying the droppings before the flies lay their eggs there, they limit their proliferation and the associated epidemics.

Many years ago, when Europeans settlers arrived in Australia, they discovered many living species that were unknown, but there were no cows. So they made them come from home for farming.

Unfortunately, cowpats are much wetter and softer than kangaroos' or other Australian animal droppings.

Australian dung beetles, unable to eliminate them, left the cowpats where they were.

In 1966, humans understood that if they did nothing, Australia would be buried under cow dung that no animal recycled. They brought dung beetles from other lands to acclimatize them. By the 80's, some species were well adapted, and removed cowpats in almost every farm. That's how a bug saved a country...

A scientist who counted : 2- Stephen Jay Gould

by Anthony M.

Stephen Jay Gould was born on the 10th of September 1941 in the Queens, in New-York, USA, and died at home on the 20th of May, 2002. He was a paleontologist, and an instructor of geology and science history in Harvard University. He is considered as one of the most influential writers of popular science.

A scientist who counted : 2- Stephen Jay Gould (*continued)*

by Anthony M.

Gould began his higher education at Antioch College. He graduated with a double major in geology and philosophy in 1963 at the University of Leeds. After finishing his graduate work at Columbia University in 1967, he immediately got a job at Harvard University where he worked a lot from 1967 to 2002 in the popularization of the theory of evolution, in biology, and in the history of sciences since Darwin.

In 1972, he proposed, with Niles Eldredge, the theory of punctuated equilibrium, which claims that progressive changes in evolution happen rather fast during comparatively short periods of environmental stress, separated by longer periods of stability of species.

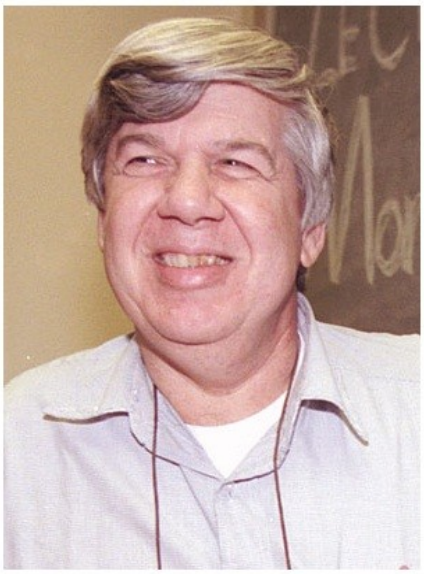
In 1983, he was awarded fellowship into the American Association for the Advancement of Science.

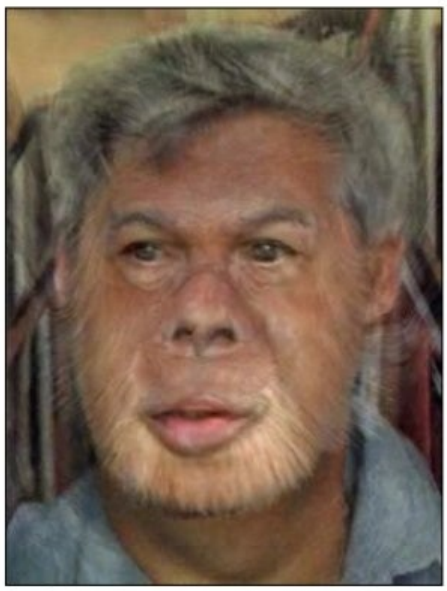
In 1989, Gould was elected to the National Academy of Sciences.

He became president of the American Association for the Advancement of Science in 1999 (and until 2001).

Gould spent the majority of his career working at the American Museum of Natural History in New York City and teaching at Harvard University. Towards the end of his life, he also taught evolution and biology at New York University.

Gould's most important contribution to the world of science was his theory of punctuated equilibrium, which he developed with Niles Eldredge in the early 1970's. This theory claims that the majority of evolution is composed of long periods of stability, which are punctuated with short periods of fast and branching evolution.





A scientist who counted : 2- Stephen Jay Gould (*continued)*

by Anthony M.

The greatest fight of his life

In July 1982, Gould was diagnosed with mesothelioma cancer. This is common in people who have been exposed to asbestos for a long time. Mesothelioma cancer sufferers have a median lifespan of only eight months after diagnosis.

The median life expectancy refers to the halfway point of survival, which means that 50% of patients with mesothelioma cancer die before 8 months, but the other half live longer. Gould decided that he could live much longer than this pessimistic number.

Luckily for him, his mesothelioma cancer was detected early (only 10% of mesothelioma patients have this luck). This, plus the fact that he was young and optimistic, and that he could pay for the best treatments available, made him believe that he could survive for a long time. After experimental treatments including surgery, chemotherapy and radiation, Gould made a miraculous recovery. He wrote an article entitled 'the Median isn't the Message', which became a source of comfort for cancer patients around the world.

In addition to his treatments, Gould was in favour of medical marijuana. During his fight with mesothelioma cancer, he smoked the illegal drug to reduce the side effects of chemotherapy and radiation. According to Gould, his use of marijuana had a decisive effect on his recovery. Stephen Jay Gould survived for 20 years after he was diagnosed with mesothelioma cancer.

Gould died on the 20th of May, 2002 from a lung cancer that spread to his brain. This cancer was not related to his mesothelioma cancer, from which he had fully recovered.