

World News Roundup



This handout image obtained from the French Museum of Natural History on May 2, shows an archaeologist at work at the site of an archaeological dig at Kalinga in the Philippines. (Inset): This handout image shows two cut flakes and a rib of rhinoceros at the Kalinga site, all evidence of the presence of a hominin 709,000 years ago retrieved from the site of an archaeological dig at Kalinga in the Philippines. (AFP)

Science

No sperm or egg required

Proto-embryo of mouse made in the laboratory

PARIS, May 3, (AFP) — Scientists have for the first time created embryo-like structures in the lab from stem cells, without recourse to eggs or sperm, they reported Wednesday.

In experiments, bundles of mouse stem cells — one type corresponding to the placenta, another to the embryo — self-organised into proto-embryos and initiated pregnancies when implanted into mouse wombs.

The procedure was not expected to create a viable embryo and did not do so, but could yield important insights into fertility and the earliest phases of life, according to a study published in the journal Nature.

"This breakthrough has opened up the black box of early pregnancy," said lead author **Nicolas Rivron**, a researcher at MERLN and Hubrecht Institutes in Utrecht, The Netherlands.

At the initial stage of development an embryo is about the width of a human hair and tucked inside the womb, making it inaccessible for in vivo research, at least in humans.

"These early embryos have all the cell types required to form a whole organism," said Rivron.

"They will help us better understand the hidden processes at the start of life, to find solutions for fertility problems, and to develop new drugs without the use of lab animals."



Rivron

Currently, some two-thirds of in vitro fertilisation (IVF) treatments fail, mostly at the time of implantation in the uterus. Why remains largely unknown.

A few days after a mammal egg has been fertilised, it develops into a so-called blastocyst, a hollow sphere formed by less than 100 cells divided into an outer layer — the future placenta

— and a small cluster in the middle, the future embryo.

Individual stem cell lines corresponding to both these sub-types have been cultivated separately in the lab for decades. Using engineering technologies, Rivron and his team assembled them for the first time in such a way as to trigger self-organisation, resulting in the formation of what they called "blastoids".

"In a natural embryo, those same stem cells are in three dimensions talking to each other in a language that we barely understand," Rivron said.

The experiments mimicked that process, and the cells spontaneously began to arrange themselves as they might in the womb.

"The embryonic cells were the chatty ones here — they are instructing the placental stem cells to multiply, organise and implant into the uterus."

The findings could shed light on adult conditions that originate from small flaws in the embryo, including some forms of diabetes or cardiovascular disease, the study said.

"This research opens the path to a new biomedical discipline," said co-author Clemens van Blitterswijk, a pioneer in tissue engineering and regenerative medicine at Maastricht University.

"We can create large numbers of model embryos and build up new knowledge by systematically testing new techniques and potential medicines."

It also dramatically reduces the need for animal experimentation, he added.

Outside experts hailed the results. "These findings may help us to understand more about some aspects of infertility and improve outcomes of assisted reproduction," commented Dusk Ilic, a reader in stem cell science at King's College London.

Harry Leith, Group Head at MRC London Institute of Medical Sciences, acknowledged the breakthrough, but cautioned that it was unlikely to be duplicated with human stem cells anytime soon.



In this undated handout photo received on April 30, 2018 from Exit International David Goodall (right), poses with Carol O'Neill of Exit International, which advocates for voluntary euthanasia, in Perth. (AFP)



Hawking



Xi

Discovery

Scientist in bid to 'end his life':

Australia's oldest scientist, wearing a top labelled "ageing disgracefully", has left the country for Switzerland to end his life at the age of 104, saying he is resentful that he must go overseas to die.

David Goodall does not have a terminal illness but his quality of life has deteriorated and he has secured a fast-track appointment with assisted dying agency Life Circle in Basel.

He got on a plane in Perth late Wednesday surrounded by friends and family saying their final goodbyes, euthanasia advocates told AFP.

He will spend several days with other family in Bordeaux, France, before heading to Switzerland where he is due to end his life on May 10.

"I don't want to go to Switzerland, though it's a nice country," he told broadcaster ABC before leaving.

"But I have to do that in order to get the opportunity of suicide which the Australian system does not permit. I feel very resentful."

Assisted suicide is illegal in most countries around the world and was banned in Australia until the state of Victoria became the first to legalise it last year. (AFP)

Hawking argued for simpler cosmos:

Weeks after his death, physicist **Stephen Hawking** has delivered his last thoughts about the nature of the cosmos, and he says it may be simpler than often believed.

Well, simpler if you understand theoretical physics, anyway. It remains incomprehensible for the rest of us.

A paper that outlines his view, written with Thomas Hertog of the University of Leuven in Belgium before Hawking's death in March, has been published by the Journal of High Energy Physics. Hertog had announced the new theory last year at a conference celebrating Hawking's 75th birthday.

The University of Cambridge, where Hawking worked, announced the publication on Wednesday.

Here's a very simplified version of what it says. First, some background. (AFP)

1,374 dancing drones: A Chinese drone company has broken the Guinness World Record for most drones flown

Palaeontology

Early bird had teeth: study

Early humans in Philippines 700K yrs ago

PARIS, May 3, (AFP) — Were the early humans roaming east Asia more than half-a-million years ago clever enough to build sea-faring watercraft and curious enough to cross a vast expanse of open sea?

This and other questions arise from the discovery in the Philippines of a butchered rhinoceros skeleton and the stone tools probably used to carve away its meat, researchers said Wednesday.

The find pushes back the arrival of the first homo species on the island chain ten-fold to 700,000 years ago, they reported in the journal Nature.

Earlier archaeological clues from Luzon island — tools at one site, prehistoric animals remains at another — hinted at the presence of primitive human species, echoing the way Homo erectus and Homo floresiensis probably populated the Indonesian archipelago during roughly the same period.

But until now, the earliest confirmed evidence of hominins — the scientific term used to group modern and early humans — in the Philippines came from a single, 67,000-year old foot bone unearthed in the Sierra Madre Mountains.

"We had the extraordinary luck to find a nearly complete, disarticulated rhinoceros," said Thomas Ingicco, a palaeoanthropologist at France's National Museum of Natural History and lead author of the study.

Analysis of the bones from the ex-

tinct species — Rhinoceros philippinensis — left no doubt "that it showed ridges left by tools," he told AFP.

Some of the cut marks were made while removing flesh, while others came from specialised tools designed to remove nourishing — and no doubt delicious — marrow.

Ingicco and his colleagues also uncovered the skeletal remains of other potentially tasty critters, including brown deer, monitor lizards, freshwater turtles and stegodons, extinct mammals combining elephant and mammoth features.

"We know that some species of human ate this rhino," said Ingicco. "But we don't know if they killed it first, or found the carcass."

All told, the Kalinga site in northern Luzon's Cagayan Valley yielded more than 400 bones and several dozen knapped — or chipped — tools, including 49 knife-like flakes and two hammers.

"This evidence pushes back the proven period of colonialization of the Philippines by hundreds of thousands of years," the authors concluded.

Several dating techniques applied to the rhino remains determined its age at between 631,000 and 777,000 years, putting it in a period known as the Pleistocene.

With no direct trace of the humans who butchered the animals, researchers could only speculate on who they were and how they got there.

Homo erectus — known to have wandered to present-day China and Southeast Asia up to million years ago — is one candidate.

It is also possible that the butchers of Kalinga had already evolved into a distinct sub-species, as likely happened to the "hobbit" of Flores, diminutive humans named for the Indonesian island where they were first found.

Also:

PARIS: A gull lookalike with teeth: scientists refined their description Wednesday of a fascinating fowl at the evolutionary junction between dinosaur and modern bird — with skull features of both.

Newly-discovered fossils show the extinct *Icthyornis dispar*, or "fish bird", had a mouth filled with sharp, curved teeth like those of a dinosaur, a team wrote in the scientific journal Nature.

But the tip had been transformed into a sharp, toothless, "pincer-like" instrument — the original bird beak.

This was likely used for preening and handling objects after reptile arms turned into wings.

"Holding and perforation of prey probably fell to the sizeable, reptilian tooth row retained," in this dino-bird, the researchers added.

Palaeontologists say the first birds evolved from small, feathered dinosaurs possibly more than 100 million years ago.

simultaneously in a 13-minute flight that involved 1,374 drones spread over a kilometre.

Chinese UAV firm EHang Egret clinched the record by 156 drones from US technology firm Intel, which flew 1,218 drones in formation during the Winter

Olympics in South Korea in February.

During a night performance on Sunday in the Chinese tourist city of Xian, the drones took on 16 different 3D formations, including a camel, a Buddha and a high-speed train, said EHang in a release.

China has championed rapid develop-

ment in its tech sector in a bid to build world-leading firms and reduce dependence on foreign products, including semiconductors, robots and drones.

As part of the performance the drone formation spelt out a popular political slogan and paid tribute to President **Xi Jinping's** cornerstone foreign policy initiative, One Belt One Road.

In August, another Chinese firm, WL Intelligent Technology Co Ltd, broke the record for most robots dancing simultaneously, involving 1,069 bi-pedal toy robots. The record has since been beaten by an Italian firm that performed the same feat with 1,372 robots. (RTRS)

Fund may ask donors for refill:

The Green Climate Fund, set up to help developing countries tackle climate change, could seek to refill its coffers in 2019, a year which is likely to see "a huge amount of attention on climate finance", said the fund's executive director.

Howard Bamsey, a former Australian diplomat, said the fund could reach the trigger point for its replenishment process later this year if the share of available funds it has allocated for projects reaches 60 percent.

The fund began making investment decisions in 2015, with pledges from donor governments of \$10.3 billion.

But it is expected to receive only about \$8 billion of that after US President Donald Trump — a climate change skeptic who plans to pull out of the Paris climate accord — indicated he would not make good on the remaining \$2 billion of the \$3 billion promised by his predecessor. (RTRS)



Lukas Wekesa (left), a plant doctor, shows a document depicting damage on maize caused by fall armyworms, during a training course for farmers at a maize farm attacked by fall armyworms in Vihiga, some 278 kms west of Nairobi on April 18. On farms across Africa, a seemingly innocuous brown and beige caterpillar is waging a silent war, devastating rural incomes and posing a major threat to the continent's food supply. In just two years, the so-called fall armyworm has colonised three-quarters of Africa, according to the British-based Centre for Agriculture and Biosciences International (CABI). (AFP)