19 FEBRUARY 2019

1. Aussie mammal the first 'climate change extinction

Australia officially declared a Great Barrier Reef rodent extinct, making it the first mammal believed to have been killed off by human-induced climate change.

The rat-like Bramble Cay Melomyswhose only known habitat was a small sandy island in far northern Australia has not been spotted in a decade.

Expected move

A key factor in its disappearance was "almost certainly" repeated ocean inundation of the cay a low-lying island on a coral reef over the last decade, which had resulted in dramatic habitat loss.

The researchers completed a wide-ranging survey in 2014 in a bid to track down the species, but found no trace.

Sea-level rise

Available data on sea-level rise and weather events in the Torres Strait region "point to human-induced climate change being the root cause of the loss of the Bramble Cay Melomys".

The Melomysrubicola , considered the Great Barrier Reef's only endemic mammal species, was first discovered on the cay in 1845 by Europeans who shot the "large rats" for sport.

2. RBI to pay govt. 28,000 cr. in interim surplus

The Reserve Bank of India announced that it would transfer 28,000 crore to the Centre as interim surplus for the half-year ended December 2018.

This will take the Centre's total receipts from the RBI as surplus transfer in 2018-19 to 68,000 crore. The central bank had earlier paid 40,000 crore to the government as its final share of surplus for 2017-18. The RBI follows July-June accounting year.

Note

The interim surplus transferred by the RBI now is crucial to the Centre's ability to meet the revised fiscal deficit target of 3.4% for this fiscal.

This is second consecutive year that the central bank has transferred interim surplus to the government.

Inclusive of the 40,000 crore transferred by the central bank as final dividend for 2017-18, the Centre has earned a total of 68,000 crore as dividend from the RBI for the 2018-19 fiscal. The accounting year of the RBI runs from July to June.

Limited audit review

Based on a limited audit review and after applying the extant economic capital framework, the board decided to transfer an interim surplus of 280 billion to the Central government for the half-year ended December 31, 2018. This is the second successive year that the Reserve Bank will be transferring an interim surplus.

The system of audit of balance sheet twice a year would be continued for the coming years also in order to decide on the interim surplus. Last year, RBI had transferred 10,000 crore as interim surplus. The government had been putting pressure on the central bank to transfer more funds from the contingency reserves. A panel, headed by former RBI Governor BimalJalan, had been formed to review the economic capital framework of the bank.

3. Japan approves stem cells trial to treat spinal cord injuries

Japanese researchers carried out an unprecedented trial using human-induced pluripotent stem cells (iPS) to treat spinal cord injuries which has the potential to develop into any cell in the body to treat patients.

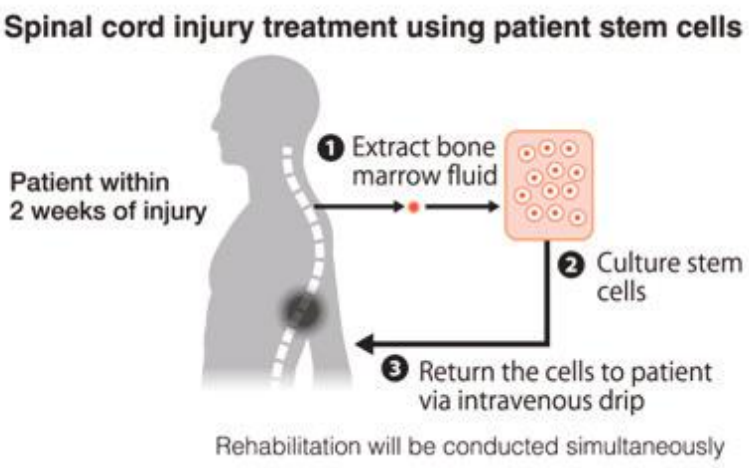
The study will be carried out on patients aged 18 or older who have completely lost their motor and sensory functions.

There are more than 1,00,000 patients in Japan who are paralysed due to spinal cord injuries but there is no effective treatment.

Parkinson's trial

The research team hopes to test the efficacy and safety of the treatment for chronic injuries as well in the future if they can confirm the safety of the technique through the clinical trial.

The announcement comes after researchers in Kyoto said in November they had transplanted iPS cells into the brain of a patient in a bid to cure Parkinson's disease.



Note

The man was stable after the operation and he will be monitored for two years.

The researchers injected 2.4 million iPS cells into the left side of the patient's brain in an operation that took about three hours.

Parkinson's disease is a chronic, degenerative neurological disorder that affects the body's motor system, often causing shaking and other difficulties in movement.

iPS cells are created by stimulating mature, already specialised, cells back into a juvenile state basically cloning without the need for an embryo.

4. Lack of cleaning in brain cells causes Alzheimer's

A weakened cleaning system of the brain cells in animals and humans is central to developing Alzheimer's disease, which may lead to new treatments for the neurodegenerative disorder.

Improving mitophagythe cleaning system of the brain cells nearly removed the symptoms of Alzheimer's in the animals.

Scientists around the world are still struggling to understand Alzheimer's better in order to treat and potentially prevent the development of the debilitating disease in the future. No new medications have been approved in recent years.

When the cleaning system does not work properly, there will be an accumulation of defective mitochondria in the brain cells. And this may be really dangerous.

At any rate, the cleaning system is markedly weakened in cells from both humans and animals with Alzheimer's. And when we improve the cleaning in live animals, their Alzheimer's symptoms almost disappear.

The researchers looked more closely at the cleaning process in brain cells from deceased Alzheimer's patients, in Alzheimer's-induced stem cells, and in live mice and roundworms with Alzheimer's.

Mitochondria live inside cells and can be seen as the cell's energy factories. Mitophagy breaks down defective mitochondria and reuses their proteins.

It is known from previous research that dysfunctional mitophagy is associated with poor function and survival of nerve cells, but so far, no connection with Alzheimer's has been shown.

Note

5. Of rising seas and sinking cities

Global average sea levels have risen roughly 7.5 inches since the 19th Century, after 2,000 years of relatively little change. The rate of sea-level rise has continued to increase in recent decades. The annual rate of rise over the last 20 years has been 0.13 inches a year, roughly twice the average speed of the preceding 80 years.

In Earth's geological past, sea level has risen and fallen dramatically. For instance, during the last Ice Age, ice covered the planet and sea level was at least 394 ft lower than what it is today. And during the Eocene - 40 million years ago, the Earth was almost ice-free and the sea level was around 230 ft higher than today. These changes are part of Earth's natural glacial cycles and have occurred over millions of years. But the current sea-level rise is caused mainly due to human activities.

The burning of fossil fuels, deforestation, decomposition of wastes in landfills and livestock have released enormous amounts of greenhouse gases into the atmosphere. These emissions have caused the Earth's surface temperature to rise, causing global warming and climate change.

Two primary factors

The rise in sea levels is linked to two primary factors, both induced by the ongoing climate change.

Thermal expansion: The oceans are absorbing more than 90 % of the increased atmospheric heat associated with greenhouse gas emissions. When water heats up, it expands. The ocean water expands to fill a greater volume and takes up more space. This is called thermal expansion, and it is responsible for one-third of the sea-level rise, according to studies.

Melting of glaciers and ice caps: Warmer temperatures cause land-based ice, such as glaciers and ice sheets to melt, and the meltwater flows into the ocean to increase sea level. Melting ice causes about two-thirds of the rise in sea level.

Impact on coastal region

- The impact of sea-level rise includes flooding of coastal areas, increased soil erosion, disappearance of low-lying islands, saltwater intrusion and habitat destruction in coastal areas. Rising sea levels also make storm surges capable of much greater damage. (Storm surge is the abnormal rise in seawater level during a storm. Storm surge can penetrate well inland.)
- Saltwater intrusion is the flow of seawater into water bodies such as rivers and aquifers (underground water-bearing rocks). It is a major concern as it can induce contamination of water resources, used for drinking, household purposes and agriculture. Increased salinity of coastal freshwater can threaten vegetation and wildlife of coastal areas.
- Many birds use coastal ecosystems to find food, live and breed. Sea turtles lay their eggs on beaches, returning to the same location every year. When beaches erode, these animals and birds will be affected.
- Islands and island life will be particularly affected due to sea-level rise.

Measuring sea level

Tide gaugeis among the oldest methods to measure sea level. A tide gauge is fitted with sensors and placed on piers. It continuously records the height of the surrounding water level. While older tide-measuring stations used mechanical floats and recorders, modern monitoring stations use advanced acoustics and electronics.

Sea level is also measured from space usinglaseraltimeters,which determine the height of the sea surface by measuring the return speed and intensity of a laser pulse directed at the ocean. The higher the sea level, the faster and stronger the return signal is.

Note