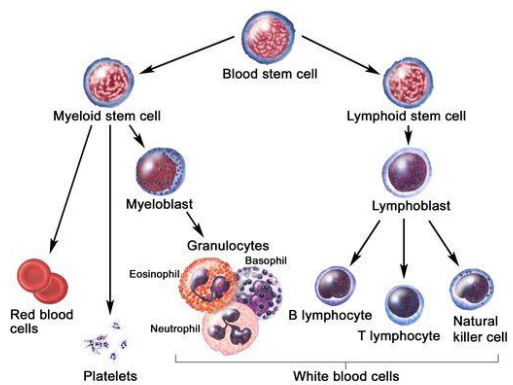


## Sucralose

- A recent study, published in Nature, provides evidence that high doses of sucralose a calorie -free sugar substitute that is 600 times sweeter than sucrose and approved by the Food and Drug Administration (FDA) for use as a general purpose sweetener can limit immune responses in mice.
- Concerns have been raised about the long -term safety of certain sweeteners.
- In line with these concerns, the latest study has shown that intake of high doses of sucralose in mice results in “immunomodulatory effects by limiting T cell proliferation and T cell differentiation”.
- Sucralose affects the membrane order of T cells, accompanied by reduced efficiency of T cell receptor signaling and intracellular calcium mobilization.



## What are T cells??

- A type of white blood cell. T cells are part of the immune system and develop from stem cells in the bone marrow.
- They help protect the body from infection and may help fight cancer. Also called T lymphocyte and thymocyte.

## THE HINDU

## TNKET

- Tamil Nadu has pioneered an initiative across the State to reduce the mortality rate among people with tuberculosis.
- The initiative TNKET (Tamil Nadu Kasanoi Erappila Thittam, meaning TB death-free project) which began in April 2022 in 2,500-odd public healthcare facilities that diagnosed TB in 30 districts



- The heart of the initiative is the ‘Differentiated TB Care’ aimed at assessing whether people with TB need ambulatory care or admission to a health facility to manage severe illness at the time of diagnosis.

- The differentiated TB care guidelines, released by the Central TB Division in January 2021, requires a comprehensive assessment of 16 clinical, laboratory.
- Preliminary assessment (triaging) of patients based on just three conditions very severe undernutrition, respiratory insufficiency, and inability to stand without support was feasible for quick identification at diagnosis and referral for admission in a healthcare facility for comprehensive assessment and further management of the disease.
- The comprehensive assessment is mainly for identifying the medical conditions that require immediate treatment.
- Using only three conditions meant that people with severe TB illness needing immediate care were identified and admitted to a healthcare facility on the same day of diagnosis even under programmatic conditions, thus vastly cutting down the delay and life increasing the chances of saving a life.

### **About TB**

- Tuberculosis (TB) is caused by a bacterium called *Mycobacterium tuberculosis*.

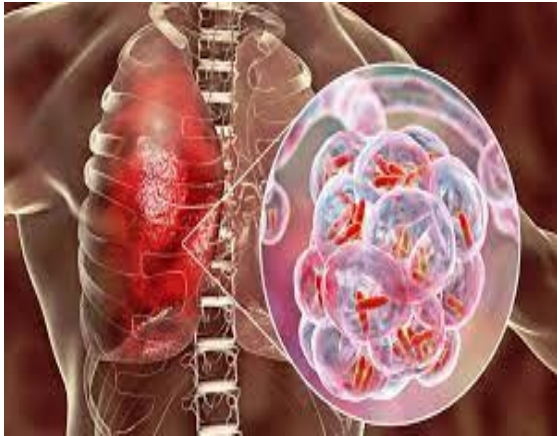
- The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain.
- Not everyone infected with TB bacteria becomes sick.
- As a result, two TB-related conditions exist latent TB infection (LTBI) and TB disease. If not treated properly, TB disease can be fatal



**THE HINDU**

### **Latent TB Infection**

- TB bacteria can live in the body without making you sick. This is called latent TB infection. In most people who breathe in TB bacteria and become infected, the body is able to fight the bacteria to stop them from growing
- TB bacteria become active if the immune system can't stop them from growing. When TB bacteria are active (multiplying in your body), this is called TB disease. People with TB disease are sick.



THE HINDU

## Brain development



- Maturity, the thinking goes, comes with age. However, this journey from childhood to adulthood is uneven: some mental attributes surface faster than others, some are more pronounced in girls, and poverty and trauma have an outsized influence on cognitive development, says one of the largest studies of its kind.



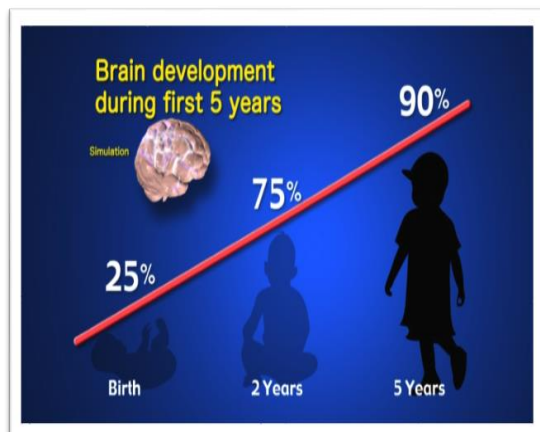
- The study is part of a long-term project called the 'Consortium on Vulnerability to Externalising Disorders and Addictions (C-Veda).
- It aims to follow up on those tested over decades, and evaluate the effect of biological and environmental risk on cognitive development.



- Brain development progresses from childhood to early adulthood with wide-ranging connections among neurons in multiple parts of the brain.
- This connectivity significantly influences abilities such as temporarily holding chunks of information, called 'working memory' (for instance, memorizing a phone number before writing it

down), and 'set shifting' (iterating multiple ways to solve a puzzle).

- These skills are classified as executive functions. Another category of functions, called social cognition helps mediate relationships.



## THE HINDU

### “Nickelback”

- A team of Rutgers scientists dedicated to pinpointing the primordial origins of metabolism has identified part of a protein that could provide scientists clues to detecting planets on the verge of producing life (Science Advances).
- This has important implications in the search for extra-terrestrial life because it gives researchers a new clue to look for.



- Based on laboratory studies, Rutgers scientists said that one of the most likely chemical candidates that kick-started life was a simple peptide with two nickel atoms, which they are calling “Nickelback” because its backbone nitrogen atoms bond two critical nickel atoms.



- Nickel, they reasoned, was an abundant metal in early oceans. When bound to the peptide, the nickel atoms become potent catalysts, attracting additional protons and electrons and producing hydrogen gas.

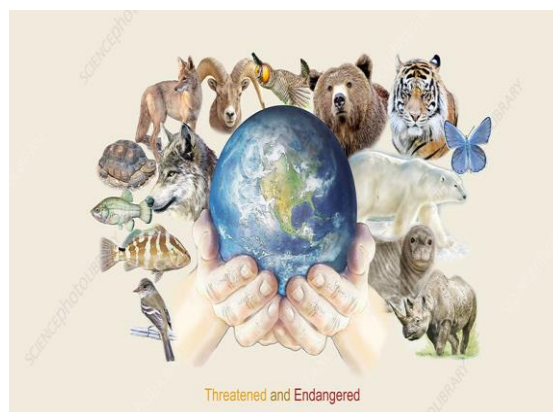
## THE HINDU

## Worldwide extremes

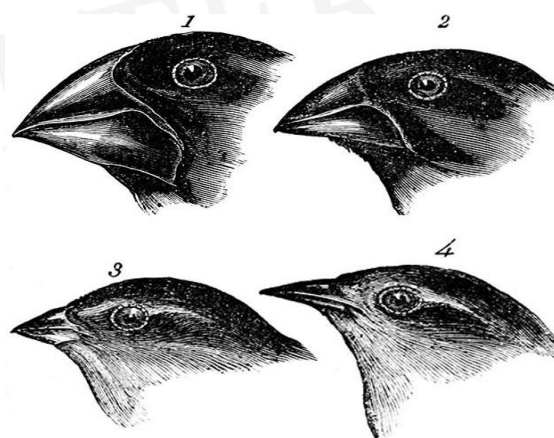
- The global intensity of water cycle extremes increased from 2002-2021 (Nature Water). This intensity is correlated with global temperature, suggesting that continued warming could cause more frequent, severe droughts and floods.
- Researchers found that there was an excess of intense droughts and extreme wet events during 2015–2021.
- During this period, the frequency of extreme events was four per year, compared with three per year over the previous 13 years.



## Evolution of species

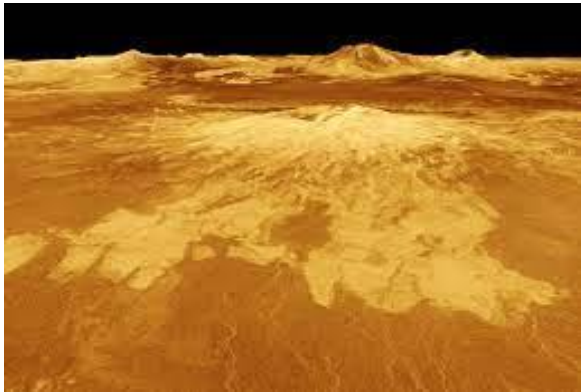


- New findings (Science) show how species that use bright coloration to keep predators away survive long enough for this warning signal coloration to evolve before predators who can better spot them through their colors learn to avoid them.



- They say predators exposed to hidden warning signals would continue to treat animals that exhibit bright colors like advertising their defenses such as toxicity with caution, providing pressure for warning coloration to become a permanent adaptation.

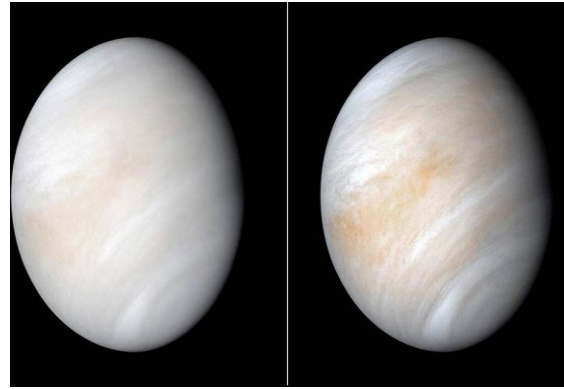
## Magellan



- Researchers have identified evidence they interpret as active volcanism on the surface of Venus, as per a new analysis of radar images from the Magellan spacecraft (Science).
- The images reveal a vent that changed shape on Venus, which they believe points to ongoing volcanic activity.
- They identified a volcanic vent which grew larger and changed shape between two

### What was Magellan?

- NASA's Magellan mission to Venus was one of the most successful deep space missions. It was the first spacecraft to image the entire surface of Venus and made several discoveries about the planet
- First deep space probe launched by a space shuttle
- First spacecraft to image the entire surface of Venus



### FACTS

- May 4, 1989: Launch
- May 5, 1989: Deployed from cargo bay of Space Shuttle Atlantis
- Aug. 10, 1990: Arrived in Venus orbit
- Oct. 13, 1994: Contact lost after Magellan was commanded to plunge into the atmosphere of Venus



- Magellan, named after the Portuguese explorer Ferdinand Magellan (1480-1521), was the first deep space probe launched by the United States in almost 11 years, and also the first probe launched by a space shuttle.

### THE HINDU

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