Prelim Bits 21-08-2023 | UPSC Daily Current Affairs

Tirunavaya

Pipeline work leads to vast megalithic site in Kerala.

- A large number of megalithic hat stones were found from a single site during a recent archaeological salvage excavation at Nagaparamba in Kuttippuram village.
- **Hat stones –** They are popularly called Thoppikkallu in Malayalam, are hemispherical laterite stones used as lid on burial urns during the megalithic period.
- Archaeologists say it could arguably be the largest number of hat stones in an unprotected site in the State.
- Many hat stones are feared to have been destroyed inadvertently by the local people in recent times.
- **Burial Sites –** A large number of megalithic burial sites and relics were found at Nagaparamba during the excavation.
- Large number of earthen urns and iron implements were salvaged with unique features, which could ostensibly throw light on the life and culture of people who lived in those parts more than 2,000 years ago.
- Ashes were found in the pots recovered from the chamber as well as from under the hat stones.

Reference

1. The Hindu – Pipeline work leads to vast megalithic site in Kerala

Namoh 108

Science Minister unveiled a variety of lotus called 'Namoh 108'.

- The lotus has 108 petals and was discovered several years ago in Manipur and kept at the institute as part of its collection of flowers and plants, on which the institute conducts research.
- However, it was not until four years ago that one of the scientists discovered that it had 108 petals.
- This is the only lotus variety in India to have had its genome sequenced.
- It was only after the number of petals was discovered that the National Botanical Research Institute (NBRI) cloned and worked on improving its germplasm and modifying its characteristics.
- The name of the variety was given by an internal committee of the NBRI.
- CSIR-NBRI would be initiating a 'Lotus Mission' as part of a larger ongoing horticultural mission to have more of the 108 Namo flowers grow in other parts of India.

References

1. The Hindu – CSIR's new lotus variety Namoh 108
2. Hindustan Times – Science Minister unveils new lotus variety

White Bellied Sea Eagles

Coastal raptors make power towers their home, which poses risk to the species and also points to the lack of suitable nesting sites near the sea.

- The white-bellied sea eagle (Haliaeetus leucogaster) is a resident raptor belonging to the family Accipitridae.
- It has a wide distribution range on the sea coast of India from Mumbai to the eastern coast of Bangladesh, and Sri Lanka in southern Asia, through all coastal south-eastern Asia, southern China to Australia.
- The raptor, a diurnal monogamous bird of prey, is categorised as being of 'least concern' on the Red List of the International Union for Conservation of Nature.
- Feeding mainly on sea snakes and fish, the bird is occasionally seen in inland waters along tidal rivers and in freshwater lakes.
- It occupies the same localities for years and generally builds nests in tall trees near the seacoast, tidal creeks, and estuaries.
- White-bellied sea eagles in India are beginning to emulate their counterparts in Australia and Thailand by making their homes on power towers holding high-tension wires.

References

1. The Hindu – Coastal raptors make power towers their home
2. Australian Museum – White-bellied Sea-Eagle

TAPAS

DRDO's TAPAS unmanned aerial vehicle crashes.

- India demonstrated significant achievement in Medium Altitude Long Endurance (MALE) drone category with the Tapas-BH.
- The indigenous Tapas-BH while still at the final stage of its trials will be critical to the Indian armed forces in terms of saving significant costs and building advanced capabilities.
- **UAV –** The Defence Research and Development Organization (DRDO) demonstrated the capabilities as Tapas Unmanned Aerial Vehicle (UAV) successfully completed its 200th flight.

Tapas-BH is the answer to India's quest for ISTAR (Intelligence, Surveillance, Target Acquisition, Tracking, and Reconnaissance) requirements.

- The development takes the crucial element of long-endurance with an effective command range of 1000 km which is the basis of Tapas.
- TAPAS-BH is a Medium Altitude Long Endurance (MALE) UAV with an operating altitude of 30000 ft, and an endurance of 24 hours.
- **SAR Payloads –** By definition, TAPAS promises the integration of the highest-grade military EO Electro-Optical (EO) and Synthetic Aperture Radar (SAR) payloads.
- That will improve the images dramatically for the ISTAR range of operations for the military across the terrain.
- TAPAS-BH also projects a range of 250 km which can carry a variety of payloads up to a maximum of 350 kg with a wing span of 20.6 meters.
- It is based on the Rustom-2 platform which has been originally conceptualized and designed to perform Intelligence, Surveillance, and Reconnaissance missions for the Indian armed forces.
- RUSTOM drones will use Indian GPS GAGAN (GPS Aided Geo Augmented Navigation) developed by ISRO.
- The DRDO has defined its wide area coverage which can detect and be able to identify small targets.
- The Tapas embraces greater technological improvement and range because of SATCOM (Satellite Communication) against regular line-of-sight communication.
- Additionally, it addresses the fundamental issues of automatic landing and take-off that were missing in the initial Rustom 2 prototype.

References

1. The Financial Express – What is the capability of DRDO’s UAV Tapas?
2. Hindustan Times – DRDO's TAPAS unmanned aerial vehicle crashes

Acoustic Side Channel Attacks (ASCA)

This AI model can steal passwords by ‘listening’ to the keyboard.

Side Channel Attacks (SCAs)

- **SCAs –** They are a method of hacking a cryptographic algorithm based on the analysis of auxiliary systems used in the encryption method.
- These can be performed using a collection of signals emitted by devices, including electromagnetic waves, power consumption, mobile sensors as well as sound from keyboards and printers to target devices.
- Once collected, these signals are used to interpret signals that can be then used to compromise the security of a device.

Acoustic Side Channel Attacks (ASCA)

- **ASCA –** In an ASCA, the sound of clicks generated by a keyboard is used to analyse keystrokes and interpret what is being typed to leak sensitive information.
- These attacks are particularly dangerous as the acoustic sounds from a keyboard are not only readily available but also because their misuse is underestimated by users.
- While most users hide their screens when typing sensitive information, no precautionary steps are taken to hide the sound of the keystrokes.

- Though the sound of keyboard clicks has become less profound, the technology with which the acoustics can be accessed and processed has also improved drastically.
- Additionally, the use of laptops has increased the scope of ASCAs as laptop models have the same keyboard making it easier for AI-enabled deep learning models to pick up and interpret the acoustics.
- ASCA attacks are not new and have been around since 1950 when acoustic emanations of encryption devices were used to crack their security.

Protection

- While there is no explicit means of defence against ASCAs, simple changes to typing could reduce the chances of attacks.
- Using touch-based typing can also reduce the chances of successful keystroke recognition from 64% to 40%, making it more difficult for threat actors to leak sensitive information.

References

1. The Hindu – What are Acoustic Side Channel Attacks?
2. Times of India – This AI model can steal passwords by 'listening' to the keyboard

Luna 25 Mission

Russia's first moon mission in decades fails as Luna-25 crashes into lunar surface.

- The mission was launched from the Vosthochny cosmodrome in the Russian Far East on August 11, 2023.
- It was the country's first mission to the lunar surface in 47 years.
- The mission was scheduled to land on the Moon on August 23, the same day as Chandrayaan-3's planned landing.
- The mission aimed at a prized destination that may hold significant quantities of ice that could be used to extract oxygen and fuel in the future.
- **Soft Landing –** Luna-25 practiced soft-landing, analyse soil samples and conduct long-term scientific research on the Moon's surface.
- It had a mass of 1.8 tons and carries 31 kilograms of scientific equipment, including some that it will use to take rock samples from up to a depth of 15 centimetres to test for the presence of water.

> *The Russian mission was expected take a lot less time to reach the Moon than Chandrayaan-3 because the latter is taking a longer route that takes advantage of the gravities of the Earth and the Moon & uses less fuel.*

References

1. The Indian Express – Russia's Luna-25 crashes into lunar surface
2. Times of India – Luna-25 has crashed into the moon



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