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EDITORIALs

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IVF OR IUI: WHICH ONE IS RIGHT FOR YOU?

There could be **many reasons** for a **couple's inability to conceive naturally.** Some of them opt for treatments to help with **infertility issues**, but most of them are unaware of the options available to them.

According to Dr Rachita Munjal, consultant-IVF, Birla Fertility & IVF, Gurugram, the **two most common methods** to help a couple conceive are: **in-vitro fertilization (IVF)** and **intrauterine insemination (IUI).**

The doctor explains that **IVF is a delicate process where eggs are removed** using a needle with a surgical procedure and **then fertilized outside the body with the sperm**, after which, the **embryo is placed into the womb.**

"IVF treatment has several steps and may sometimes take a **couple of months to complete.** It is recommended to couples who have had a **genetic condition or a history of miscarriages** or fallopian tube blockage, **azoospermia**, **severe oligospermia**, **PCOS**, endometriosis or unsuccessful IUI cycles. **IUI is often the first step before IVF**, Dr Munjal explains.

In IUI, "the **sperm is washed, concentrated and directly transferred into the uterus** to **attempt fertilization.** It is similar to the natural way of conceiving where the sperm travels from vagina through the cervix, in the uterus, and up to the fallopian tubes. **IUI is coordinated with the normal ovulation cycle of women** or they are prescribed medications that help in egg formation and egg rupture to improve the chances of pregnancy".

IVF and IUI: What is the difference?

- IUI is a relatively **non-invasive and less-expensive treatment.** It has fewer steps.
- In IUI, **fertilization takes place in the body** whereas **in IVF, fertilization is done in the lab.**
- **IVF has higher chances of pregnancy.**

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- Generally, **IUI may be the only treatment needed.** But fertility specialists may suggest IVF if IUI does not work.

Dr Munjal says the two treatments have some things in common. "**Before fertilization**, **both IUI and IVF may include fertility drugs** to increase success rates. Both the treatments include **processes to isolate the highest quality sperm** from the provided samples for use in the fertilization process."

"For undergoing any treatment or procedure, it is recommended that a specialist is consulted. Every case, **every patient and every situation is unique.** We can never generalise. A doctor will help in determining the **best course to achieve pregnancy**," the doctor concludes.

ONE NATION, ONE POLICE IS A REFORM THAT IS LONG OVERDUE

The Government of India has been talking of **"One Nation, One Ration Card", "One Nation, One Registry", "One Nation, One Gas Grid"**, and even **"One Nation, One Election"**.

- The idea of **One Nation One Police** would contribute to an integrated scheme in different facilities and networks across the country.

Need for Police Reforms in India

- **Every state is legislating a different Police Act:** These Acts are being passed purportedly in compliance with the Supreme Court's directions on police reforms given in 2006.
  - Eighteen states have already passed Police Acts and India is in the process of having "one nation, many police acts".
- **Violations of Supreme Court's decision:** In the absence of any central guidance or directive, several states passed their own Police Acts and blatantly violating the Supreme Court's directions.
- **Lack of will for uniform police reforms:** Neither the central leadership nor the state satraps displayed any such intent to implement police reforms and haven't showed the required vision.
- **Poor governing structure of police:** The archaic police structure created by the imperial power continues to haunt us and gives us harrowing moments from time to time with police not being able to meet the democratic aspirations of the people.
- **Police being used as political tool:** Both the Central and State police forces come under the superintendence and control of political executives which has resulted in the lack of democratic functioning and appropriate direction.
  - There has been an instance where Mumbai police commissioner had accused the state home minister of using the police as an instrument for extortion.

- **Manpower shortage in the police department:** The police-population ratio, currently 192 policemen per lakh population, is less than what is recommended by UN i.e. 222 policemen per lakh population.
  - It results in the overburdening of work not only reduces the effectiveness and efficiency of the police personnel but also leads to psychological distress which contributes to various crimes committed by the policemen.

Challenges in implementing Police Reforms

- **Problem in restoration of the culture of law:** The challenge of India is to restore the culture of rule of law, and make police and justice accessible, effective and credible.
- **Trust deficit in police:** The people have little or no faith left in the police system and the restoration of that faith is an uphill task.
- **Constitutional Limitations of Central Government:** Police being a State subject in the seventh schedule to the Constitution of India, it is primarily the State Governments who have to implement the various police reforms measures.
  - The Centre has been making consistent efforts to persuade the States from time to time to bring the requisite reforms in the Police administration to meet the expectations of the people.
- **Politicization of Police:** The pressure from politicians is the biggest hindrance in crime investigation such as premature transfers of police investigating officers.

Measures to be adopted for Police Reforms

- **Uniform law based on Model Police Act, 2006:** The Government of India should have enacted a law based on this Model Police Act with such changes as it may have found necessary, and the states should have mutatis mutandis adopted it.
  - It would have ensured a uniform police structure across the country.
- **Cooperative Federalism:** The best option would be for the central and state governments to respect each other's turf in a spirit of cooperative federalism.

- It would be necessary to have a fresh look at the distribution of powers in the seventh schedule of the Constitution.

- **Creation of independent complaint authority:** Both the Second Administrative Reform Commission and the Supreme Court have accepted the need for having an independent complaint authority to inquire into the cases of police misconduct.
- **Functional autonomy:** While recognizing that the police is an agency of the State and therefore accountable to the elected political executive, the Committee has specifically outlined the role of Superintendence of the State Government over the police.
  - The Model Police Act suggested creation of a State Police Board, Merit-based selection and appointment of the Director General of Police, ensuring security of tenures, setting up of Establishment Committees.
- **Constitute a Police Establishment Board:** It will decide postings, transfers and promotions for officers below the rank of Deputy Superintendent of Police, and make recommendations to the state government for officers of higher ranks.
- **Restore the autonomy of the DGP heading the state police:** It will begin with the defining of the process of DGP's selection and appointment itself.
  - The Centre must actively discharge its constitutional duty of reprimanding a state for serious failures in the sphere of implementation of law and maintenance of order.

Road ahead

- There is **need to act with conviction and without further delay upon remedial measures** to prevent interference with, and misuse of the police by illegal or improper orders or pressure from political, executive or other extraneous sources.
- The police must be **accountable as an organization** and officers must be accountable as individuals for their actions.

- The **performance evaluation must be built in to the policing laws** to ensure organizational accountability, while independent civilian oversight has proven to be the most effective accountability mechanism for individual officers in reforming jurisdictions around the world.
- The **policing in India must become officer-oriented** which is not what obtains at the police station, the focal point of law and order management.
- It has to be stated that police reforms in this country must begin with the **Indian Police Service redefining its role and responsibility** in helping to run a secular democratic rule.

PARLIAMENTARY COMMITTEES MUST NOT BE HIJACKED BY POLITICS

The recent goings-on in the **standing committee on information technology has once again drawn attention** to the system of standing committees, which is one of the major innovations of our parliamentary system of governance.

Parliamentary Committees

- The Parliamentary Committees are of two kinds – **Standing Committees and ad hoc Committees**.
  - The former are **elected or appointed every year or periodically** and their work goes on, more or less, on a continuous basis.
  - The latter are **appointed on an ad hoc basis** as need arises and they cease to exist as soon as they complete the task assigned to them.
- **Standing Committees:** Among the Standing Committees, the three Financial Committees (Committees on Estimates, Public Accounts and Public Undertakings) constitute a distinct group as they keep an unremitting vigil over Government expenditure and performance.
- The functions of these Committees are:
  - To consider the **Demands for Grants of various Ministries/Departments** of Government of India and make reports to the Houses;
  - To examine such **Bills as are referred to the Committee by the Chairman, Rajya Sabha or the Speaker, Lok Sabha**, as the case may be, and make reports thereon;
  - To consider **Annual Reports of ministries/departments** and make reports thereon; and

- To consider policy **documents presented to the Houses**, if referred to the Committee by the Chairman, Rajya Sabha or the Speaker, Lok Sabha, as the case may be, and make reports thereon.

- The **appointment, terms of office, functions and procedure of conducting** business are also more or less similar and are regulated as per rules made by the two Houses under Article 118(1) of the Constitution.

Importance of Parliamentary Committees in Indian Political System

- **Forum for complex parliamentary discussions:** The Parliament deliberates on matters that are complex, and therefore needs technical expertise to understand such matters better.
  - The Committees help with this by providing a forum where Members can engage with domain experts and government officials during the course of their study.
- **Building consensus across political parties:** The proceedings of the House during sessions are televised, and MPs are likely to stick to their party positions on most matters.
  - The Committees have closed door meetings, which allow them to freely question and discuss issues and arrive at a consensus.
- **Proper examination of policy issues:** The committees also examine policy issues in their respective Ministries, and make suggestions to the government.
  - The government has to report back on whether these recommendations have been accepted or not and based on this, the Committees then table an Action Taken Report, which shows status of the government's action on each recommendation.

- **Integral part of Parliament's role in the debate:** The standing committees provide a platform for MPs to track government expenditure, scrutinize policies and bills and seek expert advice.
- **Huge reservoirs of information:** Indian parliamentary committees are a huge reservoirs of information, which are made available to MPs in order to enlighten themselves, and contribute ideas to strengthen the parliamentary system and improve governance.

Challenges faced by Parliamentary Committees

- **Mandatory to work behind closed doors:** It is a pity that in this day and age of complete transparency, the committees are forced to function confidentially.
  - It is one of the main reasons why their good work is not known outside Parliament.
- **Declining trend in referring bills to Committees:** In the 15th LS, 71% of the Bills introduced were referred to Committees for examination, as compared to 27% in the 16th Lok Sabha.
  - It leads to some Bills being passed without the advantage of a Committee scrutinizing its technical details.
- **Time at its disposal is limited:** The functions of Parliament are not only varied in nature, but considerable in volume.
  - It cannot make very detailed scrutiny of all legislative and other matters that come up before it.
- **Reduced working hours of committees:** The standing committees under the first NDA government met for 145.5 hours less than the ones under the preceding United Progressive Alliance government.
- **Diminished say in legislative matters:** Ordinances are passed when Parliament is not in session and the government is required to take immediate action.

- No ordinance is allowed to be in force for more than six months without parliamentary approval.

- **Partisanship curtailing deliberation:** The political partisanship during the proceedings of committees have reduced its deliberation over important issues such as tracking the expenditure of ministries and, consequently, its ability to hold the government to account.
  - The committee on home affairs saw political partisanship during its meeting on Kashmir post abrogation of Article 370.
  - The restrictions in Jammu and Kashmir were ordered on August 5, 2019, and the bifurcation of the state into two Union Territories was officiated on October 30, 2019.

Measures to be adopted for Parliamentary Committees

- **Power to ask for bills related to its area of operation:** It should be given to parliamentary committee so that the issues regarding policy can be discussed in a holistic approach.
- **Increase in number of meetings of committees:** If the chairman of the Rajya Sabha and the Speaker of the Lok Sabha meet the chairmen of committees at least once in two months to discuss issues related to the committees, there will be a significant improvement in their functioning.
- **Longer tenure for members:** The committee system allows a smaller group of legislators to develop technical expertise on a particular subject and ensure better deliberation.
  - In the present format, the members are nominated to a Standing Committee for one year.
- **Research Support:** To equip members to gain an in-depth understanding of issues and finally give sound and nuanced recommendations, it is important that quality research is made available to them.

- **Reducing the number of standing committees:** The NCRWC argues for trimming the number of Standing Committees and entrusting them with additional responsibilities of financial oversight and doing away with existing finance committees to avoid overlapping of work.
- **Creation of Standing Committee on Economy:** The NCRWC also makes a case for establishing Standing Committee on Economy providing space for deliberations on economic policies and its implementation separately.

Road ahead

- ❖ The committee proceedings are often **publicly available or even live-streamed over the internet in some jurisdictions** which would certainly allow the public to play a greater role in the functioning of these committees.
- ❖ The Parliamentary Committees **serve as a forum of deliberation** and are the backbone of our parliamentary system.
- ❖ Strengthening the committee **system can go a long way in improving the quality of laws** drafted and minimise potential implementation challenges.
- ❖ The need of the hour is for **greater and effective utilization of Parliamentary Committees to strengthen Parliament** as a deliberative body which can ensure effective oversight.
- ❖ The need for **referring all bills to committee, longer tenure for members and strengthening committees** with adequate research support also find mention in the National Commission to Review the Working of the Constitution (NCRWC), 2002.

WHAT PLUMES ON ENCELADUS TELL US ABOUT POSSIBILITY OF LIFE ON SATURN'S MOON?

NASA's Cassini spacecraft has detected an **unusually high concentration of methane**, along **with carbon dioxide and dihydrogen**, in the **moons of Saturn** by flying through **their plumes.** The spacecraft has found that **Titan has methane** in its **atmosphere** and **Enceladus has a liquid ocean with erupting plumes of gas and water.**

An international research team has used **new statistical methods** to understand if **methanogenesis or methane production by microbes** could explain the **molecular hydrogen and methane.** The models combined geochemistry and microbial ecology to decode what possible processes could explain these observations.

A paper published in **Nature Astronomy** concluded that there may be unknown **methane-producing processes on Enceladus** that await discovery.

Most of the methane on Earth has a biological origin. Microorganisms called methanogens are capable of **generating methane as a metabolic byproduct.** They do not require oxygen to live and are widely distributed in nature. They are found in **swamps**, **dead organic matter**, and **even in the human gut.** They are known to survive in **high temperatures** and simulation studies have shown that **they can live in Martian conditions.** Methanogens have been widely studied to understand if they can be a **contributor to global warming.**

Obviously, we are not concluding that **life exists in Enceladus' ocean**," said Régis Ferrière, one of the lead authors, in a release. "Rather, we wanted **to understand how likely it would be that Enceladus' hydrothermal vents** could be **habitable to Earth-like microorganisms.** Very likely, the Cassini data tell us, according to our models.

And **biological methanogenesis appears to be compatible with the data.** He

adds: "In other words, we can't discard the '**life hypothesis**' as highly improbable. To reject the life hypothesis, we need more data from future missions."

Using the **newly developed model**, the team gave a set of conditions, including **dihydrogen concentration** and **different temperatures to understand if microbes would grow.** They also looked at **what amount of methane would be emitted** if there was a **hypothetical microbe population on Enceladus.** "In summary, not only could we evaluate whether **Cassini's observations are compatible with an environment habitable for life**, but we could also make quantitative predictions about observations to be expected, should **methanogenesis actually occur at Enceladus' seafloor**," Prof. Ferrière explained.

The team writes that **methane could be formed by the chemical breakdown of organic matter** present in **Enceladus' core. Hydrothermal processes** could help the **formation of carbon dioxide and methane.** On Earth, **hydrothermal vents on seafloors** are known to release methane, but this happens at a very slow rate. Ferrière explained that this hypothesis is plausible but only if Enceladus was formed through the **accretion of organic-rich material from comets.**

The results suggest that **methane production from hydrothermal vents is not sufficient to explain** the **high methane concentration detected by Cassini** in the plumes. An additional amount of methane produced via **biological methanogenesis** could match **Cassini's observations.** "Searching for such microbes at **Enceladus' seafloor** would require extremely challenging deep-dive missions that are not in sight for several decades," concludes Prof. Ferrière.

NITI AAYOG AND RMI RELEASE A REPORT ON POWER DISTRIBUTION SECTOR

Recently, the NITI Aayog has released a report titled **'Turning Around the Power Distribution Sector'** that presents reform pathways.

Status of Power Distribution Companies

- **Operational Performance:** The continuous improvement in billing and collection efficiency has gradually helped in reducing Aggregate Technical and Commercial (AT&C) losses across the country.
    - The overall AT&C loss has come down to 22 percent but when compared at the global level, losses are still high, and much is to be done.
    - In 2018–19, distribution utilities incurred a total expenditure of ₹ 712,610 crore against a total revenue of ₹ 663,093 crore.
- **Subsidy Dependence:** Apart from straining a state's finances, continued reliance on subsidies disincentivises DISCOMS from making serious structural improvements.
- **Role of Taxes:** The discoms have little control over bulk supply tariff and are engaged in long-term PPAs with generating companies, these taxes get transferred via tariffs to end consumers.

Concerns associated with Power Distribution Sector

- **Cost optimization:** It continues to be difficult to achieve due to factors such as legacy Power Purchase Agreements (PPAs) and poor investment in distribution infrastructure.
- **Liquidity stresses of DISCOMS:** It is added due to delays in receiving subsidy reimbursements from the government because the discoms in the north-eastern states and agrarian states are especially dependent on government subsidies.

- **Outstanding Dues:** The systemic shortcomings ultimately result in a high level of debt and payments owed to generation companies (gencos) because the overdue amount to gencos stood at ₹67,917 crore in March 2021.
- **Electricity does not come under GST:** The states charge electricity duty based on consumption. This may differ from state to state and can go up to 20 percent in some cases.
    - It may be noted that while coal is under GST, the end product, electricity, is not which prevents utilities from accessing the input tax credit mechanism, leading to a cascading effect where the taxes that are levied on utilities are added to the cost of power.
- **Fuel Security Concerns:** The thermal capacity addition is plagued by the growing fuel availability concerns faced by the Industry.
    - The coal supplies by CIL is restricted to around 65% of actual coal requirement by coal based thermal plants, leading to increased dependence on imported coal with the cascading result of high power generation costs.

Measures for reforming Power Distribution Sector

- **Upgrading Distribution Infrastructure:** Many loss-making discoms are unable to invest in the upgradation and maintenance of their equipment due to lack of resources.
- **Metering and Billing:** Smart and prepaid meters can be an important component of the solution to billing and collection challenges.
    - Smart meters increase the efficiency of the billing and collection process by reducing human intervention and consequently empowering both consumers and discoms.

- **Improving Collection Efficiency:** The Discoms require the support of government machinery, in the form of police and courts, to settle legal and administrative disputes.
- **Renewable Purchase Obligations (RPOs):** They are a policy instrument to ensure the uptake of renewable energy which requires discoms, energy producers and certain consumers to obtain a share of their electricity from renewable sources.
- **Decentralised Renewable Energy:** There is a renewed interest in decentralized renewable energy (DRE) systems today due to the sharp fall in prices, the imperative of decarbonization, the continuing shortage or unreliability of electricity in many parts of the country, and the desire for greater resilience.

Recommendations for revamping Power Distribution Sector

Structural Reforms

- **Greater autonomy for state-owned discoms:** For a state-owned utility to succeed, there should be a clear separation between utility and state and it should have operational and financial autonomy.
    - The performance of state-owned discoms is also determined by the ability of the respective SERC to revise tariff frequently and adequately.
- **Distribution franchisee:** There can be a variety of distribution franchisees, from models that are essentially outsourcing revenue collection to taking care of all distribution functions.
- **Increasing competition:** Discoms have a monopoly in their area of functioning and delicensing distribution can introduce competition and enable retail choice for customers.
- **Vertical unbundling:** Even where there has been de jure unbundling of

- state-owned power utilities, they may continue to act as de facto integrated utilities.
    - ➢ Vertical unbundling enables transparency in operations of the discom and it can focus attention to the parts of the utility (generation, transmission or distribution) that require reform.

Regulatory Reforms

- The state governments should **promote autonomy, competence, and transparency** of the SERC.
- The **tariffs should be regularly revised** to ensure that they fairly reflect the actual fixed and variable costs.
- The DBT scheme could be structured such that **consumers do not stand to lose their current benefits** but are paid more for efficient use of electricity.

Operational Reforms

- **Reducing power procurement costs:** Discoms should optimize their power purchase by procuring from the markets as suitable, and they should be rewarded for efficiency gains from the use of the market.
- **Reduce technical losses:** Discoms may reduce their technical losses through investment by improving their grid (including upgrading conductors, high-tension lines, and right-sizing transformers) and through the implementation of appropriate monitoring technologies.

Road ahead

- ❖ The **private sector has been playing a key role in generating power and a more supportive environment** will help in bridging the energy deficit of the country.

- The history of power sector reforms tells us that **India is too large and diverse for a one-size-fits-all approach** and importing external expertise, structural frameworks, and new technology will be required.
- **A flexible and home-grown approach to reform**, which is supported by states and the Centre, and allows for 'learning by doing', will be instrumental in determining the success of reforms.

- The need for a **low-carbon and climate-resilient future**, makes it crucial for the Indian electricity distribution sector to achieve operational efficiency, profitability, and a readiness for emerging and future demand as well as technological changes.

PEGASUS – INDIA'S WATERGATE?

Pegasus is a type of malicious software or **malware classified as a spyware.** It is **designed to gain access to devices, without the knowledge of users**, and gather personal information and relay it back to whoever it is that is using the software to spy.

Pegasus has been **developed by the Israeli firm NSO Group** that was set up in 2010. The earliest version of Pegasus discovered, which was captured by researchers in 2016, **infected phones through what is called spear-phishing** – text messages or emails that trick a target into clicking on a malicious link. Since then, however, NSO's attack capabilities have become more advanced. Pegasus infections can be achieved through so-called **"zero-click" attacks**, which do not require any interaction from the phone's owner in order to succeed. These will often exploit "zero-day" vulnerabilities, which are flaws or bugs in an operating system that the mobile phone's manufacturer does not yet know about and so has not been able to fix.

How does it work?

- Pegasus, in the very basic form, can infect devices that are connected to the internet. Some updated versions can also infect phones even without the victim clicking on any links or messages.
- Most spyware and stalkerware apps disguise themselves as anti-theft applications that can be used to track stolen or lost devices.
- While viruses and malware can be detected by anti-virus software, spyware & stalkerware apps disguise themselves as useful and send out stolen data to central servers without the knowledge of users.
- The software can, based on instructions from a remote server, automatically turn on the camera and the microphone and look into chats, access the calendar and read SMS-es and emails.

Pegasus is compromising

- Upon installation, Pegasus contacts the attacker's command and control (C&C) servers to receive and execute instructions and send back the target's private data. This data can include passwords, contact lists, text messages, and live voice calls (even those via end-to-end-encrypted messaging apps).
- The attacker can control the phone's camera and microphone, and use the GPS function to track a target.
- To avoid extensive bandwidth consumption that may alert a target, Pegasus sends only scheduled updates to a C&C server.
- The spyware can evade forensic analysis and avoid detection by anti-virus software. Also, the attacker can remove and deactivate the spyware, when and if necessary.

Earlier Controversy

- Researchers discovered the earliest version of Pegasus in 2016. This version infected phones through what is called spear-phishing – text messages or emails that trick a target into clicking on a malicious link.
- In 2019, WhatsApp blamed the NSO Group for exploiting a vulnerability in its video-calling feature which secretly transmitted malicious code in an effort to infect the victim's phone with spyware without the person even having to answer the call.
- In 2020, a report showed government operatives used Pegasus to hack phones of employees at Al Jazeera and Al Araby.

Pegasus Attacks in India

- Human Rights activists, journalists and lawyers around the world have been targeted with phone malware sold to authoritarian governments by

an Israeli surveillance firm. Indian ministers, government officials and opposition leaders also figure in the list.

- In India, several opposition leaders including Rahul Gandhi were on the leaked potential targets' list.
- Smartphones of Politicians, Journalists were hacked for gathering confidential information.
- This is the first time in the history of this country that all pillars of our democracy — judiciary, parliamentarians, media, executives and ministers — have been spied upon.
- The Indian government has denied any wrong doing or carrying out any unauthorized surveillance. However, the government has not confirmed or denied whether it has purchased or deployed Pegasus spyware.

Legislations on Surveillance

The laws authorizing interception and monitoring of communications are:

- Section 92 of the Criminal Procedure Code (CrPC)
- Rule 419A of the Telegraph Rules, and
- The rules under Sections 69 and 69B of the IT Act

- **Watergate scandal**
- The Watergate scandal was a political scandal that occurred in the United States in the 1970s as a result of the June 17, 1972, break-in at the Democratic National Committee headquarters at the Watergate office complex in Washington, D.C., and the Nixon administration's attempted cover-up of its involvement. The scandal eventually led to the resignation of Richard Nixon, the President of the United States, on August 9, 1974 — the only resignation of a U.S. President to date. The scandal also resulted in the indictment, trial, conviction, and incarceration of forty-three persons, dozens

of whom were Nixon's top administration officials. The affair began with the arrest of five men for breaking and entering into the Democratic National Committee headquarters at the Watergate complex on June 17, 1972. The Federal Bureau of Investigation connected cash found on the burglars to a slush fund used by the Committee for the Re-Election of the President, the official organization of Nixon's campaign. In July 1973, as evidence mounted against the president's staff, including testimony provided by former staff members in an investigation conducted by the Senate Watergate Committee, it was revealed that President Nixon had a tape-recording system in his offices and he had recorded many conversations. Recordings from these tapes implicated the president, revealing he had attempted to cover up the questionable goings-on that had taken place after the break-in. After a protracted series of bitter court battles, the U.S. Supreme Court unanimously ruled that the president had to hand over the tapes to government investigators; he ultimately complied.

Conducting Surveillance

A limited number of agencies are provided powers to intercept and monitor.

- In 2014, the Ministry of Home Affairs told Parliament that nine central agencies and the DGPs of all States and Delhi were empowered to conduct interception under the Indian Telegraph Act.
- In 2018, 9 central agencies and 1 State agency were authorised to conduct intercepts under Section 69 of the IT Act.
- The Intelligence Organisations Act, which restricts the civil liberties of intelligence agency employees, only lists four agencies. However, the RTI Act lists 22 agencies as "intelligence and security organisations established by the central government" that are exempt from the RTI Act.

K.S. Puttaswamy judgment, 2017 regarding Surveillance

- The K.S. Puttaswamy judgment, 2017, made it clear that any invasion of privacy could only be justified if it satisfied three tests:

1. The restriction must be by law;
2. It must be necessary (only if other means are not available) and proportionate (only as much as needed);
3. It must promote a legitimate state interest (e.g., national security).

- The judgement held that privacy concerns in this day and age of technology can arise from both the state as well as non-state entities. As such, a claim of violation of privacy lies against both of them.
- The Court also held that informational privacy in the age of the internet is not an absolute right and when an individual exercises his right to control over his data, it may lead to the violation of his privacy to a considerable extent.
- It was also laid down that the ambit of Article 21 is ever-expanding due to the agreement over the years among the Supreme Court judges. A plethora of rights have been added to Article 21 as a result.
- The court stated that Right to Privacy is an inherent and integral part of Part III of the Constitution that guarantees fundamental rights. The conflict in this area mainly arises between an individual's right to privacy and the legitimate aim of the government to implement its policies. Thus, we need to maintain a balance while doing the same.

Past recommendations regarding Surveillance

- In 2010, then Vice-President called for a legislative basis for India's agencies and the creation of a standing committee of Parliament on intelligence to ensure that they remain accountable and respectful of civil liberties.
- The Cabinet Secretary in a note on surveillance in 2011 held that the Central Board of Direct Taxes having interception powers was a

continuing violation of a 1975 Supreme Court judgment on the Telegraph Act.

- . In 2013, the Ministry of Defence-funded think-tank published a report which recommended that the intelligence agencies in India must be provided a legal framework for their existence and functioning; their functioning must be under Parliamentary oversight and scrutiny.
- In 2018, the Srikrishna Committee on data protection noted that post the K.S. Puttaswamy judgment, most of India's intelligence agencies are "potentially unconstitutional". This is because they are not constituted under a statute passed by Parliament — the National Investigation Agency being an exception.

Major Concerns

- **Scale of usage:** The allegations here are not new. What is new is the scale of the targeting of innocent people that's allegedly taking place. Nearly 200 reporters from 21 countries have their phone numbers on this list.
- **Attack on Dissidents**: It reflects a disturbing trend with regard to the use of hacking software against dissidents and adversaries. In 2019 also, Pegasus software was used to hack into HR & Dalit activists.
- **Violation of Fundamental Rights**: The very existence of a surveillance system, whether under a provision of law or without it, impacts the right to privacy and the exercise of freedom of speech (Article 19) and personal liberty (A-21).
- **Endangers Safety of journalists**: In the absence of privacy, the safety of journalists, especially those whose work criticises the government, and the personal safety of their sources is jeopardised.
- **Declining Press Freedom:** World Press Freedom Index produced by Reporters Without Borders has ranked India 142 out of 180 countries in 2021 (India's ranked 133 in 2016)

- **Leads to Self-Censorship**: The perceived danger, founded on reasonable suspicion that surveillance may happen, itself impacts their ability to express, receive and discuss such ideas.
- **Dangers of Mass Surveillance**: As spyware becomes more affordable and interception becomes more efficient, there will no longer be a need to target specific individuals. Everyone will be potentially subject to state-sponsored mass surveillance.
- **Weak Legislative Protection**: The proposed legislation related to the personal data protection of Indian citizens fails to consider surveillance while also providing wide exemptions to government authorities.

Initiatives taken in India:

- **Cyber Surakshit Bharat Initiative:** It was launched in 2018 with an aim to spread awareness about cybercrime and building capacity for safety measures for Chief Information Security Officers (CISOs) and frontline IT staff across all government departments.
- **National Cyber security Coordination Centre (NCCC):** In 2017, the NCCC was developed to scan internet traffic and communication metadata (which are little snippets of information hidden inside each communication) coming into the country to detect real-time cyber threats.
- **Cyber Swachhta Kendra:** In 2017, this platform was introduced for internet users to clean their computers and devices by wiping out viruses and malware.
- **Indian Cyber Crime Coordination Centre (I4C):** I4C was recently inaugurated by the government.
  - National Cyber Crime Reporting Portal has also been launched pan India.
- **Computer Emergency Response Team – India (CERT-IN):** It is the nodal agency which deals with cybersecurity threats like hacking and phishing.

- **Legislation:**
  - **Information Technology Act, 2000**.
  - **Personal Data Protection Bill, 2019.**

Global Mechanisms:

- **International Telecommunication Union (ITU):** It is a specialized agency within the **United Nations** which plays a leading role in the standardization and development of telecommunications and cyber security issues.
- **Budapest Convention on Cybercrime:** It is an international treaty that seeks to address Internet and computer crime (cybercrime) by harmonizing national laws, improving investigative techniques, and increasing cooperation among nations. It came into force on 1st July 2004. **India is not a signatory** to this convention.

Road ahead

The need for **judicial oversight over surveillance systems** in general, and judicial investigation into the Pegasus hacking in particular, is essential. Only the judiciary can be competent to decide whether specific instances of surveillance are proportionate, whether less onerous alternatives are available, and to balance the necessity of the government's Security objectives with the rights of the impacted individuals.

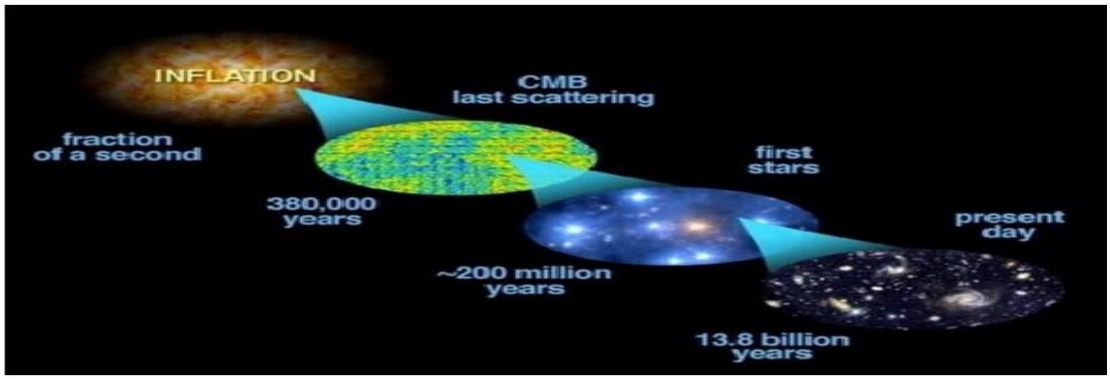
WHERE IS THE EDGE OF SPACE?

On July 11, British businessman **Richard Branson beat rival Jeff Bezos** to reach the **edge of space**, giving **space tourism an official kickstart.** But experts and space enthusiasts are **in doubt whether the height to which he travelled** can be **termed 'space'.**

The **most widely accepted boundary of space** is known as the **Kármán line**, **100km above mean sea level.** But the **United States uses 80km as the cutoff point. Branson's Virgin Galactic flight** reached a **height of 86km** while **Jeff Bezos' Blue Origin flight is expected to go about 106km high.**

The **Kármán line** has been **compared to international waters**, as there are **no national boundaries and human laws in force beyond the line.** It was named after aerospace pioneer **Theodore von Kármán**, who wrote in his autobiography: "This is certainly a physical boundary, where **aerodynamics stops and astronautics begins**...**Below this line**, **space belongs to each country**. Above this level, **there would be free space.**"

The **1967 Outer Space Treaty** says that **space should be accessible to all countries** and **can be freely and scientifically investigated.** Defining a legal boundary of what and where space is can help avoid disputes and keep track of space activities and human space travel.



Some countries, **including the United States**, believe that **defining or delimiting outer space is not necessary.** At a **United Nations meeting in Vienna in 2001**, the US delegation said: "**No legal or practical problems have arisen in the absence of such a definition**...The lack of a definition or delimitation of outer space has not impeded the development of activities in either sphere."

On the other hand, **Thomas Gangale, an expert on space law**, told The Verge that now is the time to define what space truly is, because more and more commercial companies have plans to go to space. "In the long-term, as we see more commercial operations in those altitudes, especially getting up into orbit and coming back, these private companies are going to want the legal certainty that **would be provided by having a set altitude or limit**," said Gangale.

It has been **tricky understanding where our atmosphere ends** and **what should be called space.** American astrophysicist and science communicator **Neil deGrasse Tyson** told CNN's GPS show that he does not believe Branson's flight can be termed as space travel, and that NASA was able to perform a similar **sub-orbital flight about 60 years ago.**

In 2009, researchers from the University of Calgary measured the **winds of Earth's atmosphere** and the **flow of charged particles in space** and wrote that the edge of **space begins at 118km above sea level.**

Jonathan C McDowell from Harvard-Smithsonian Center for Astrophysics published a paper in 2018, revisiting the proposed definitions of **the boundary between the Earth's atmosphere and outer space**. He noted that the **Kármán line** or "boundary was chosen as a nice round figure", but it needs more studies from "a physical point of view". Dr McDowell studied the different layers of the atmosphere and **proposed that 80 km was a more appropriate boundary.**

The **Earth's atmosphere has been divided into various layers**, with the **troposphere starting at the Earth's surface** and **extending about 14.5 km high**, **stratosphere extending to 50 km**, **mesosphere to 85 km**, **thermosphere to 600 kilometers** and **exosphere to 10,000 km.**

Dr McDowell noted that the **chemical composition of the atmosphere was largely constant up to the mesopause**, or the **boundary between the mesosphere and the thermosphere.**

"From a physical point of view, it is therefore reasonable to think of the atmosphere proper as including the **troposphere and stratosphere** and (with some qualification) the mesosphere, and **identifying the thermosphere and exosphere** with the common idea of 'outer space'," added the paper.

Terry Virts, a former commander of the **International Space Station** who has spent **more than 213 days in orbit**, in an interview to **National Geographic** said there's a big difference between **riding along on a five-minute suborbital flight** and **performing a six-month orbital mission**, but when it comes down to it, folks on both types of trips have earned the "**astronaut**" title.

NASA astronaut Mike Massimino, who helped **repair the Hubble Space Telescope**, told **National Geographic** that there is an important distinction between being selected as a NASA astronaut — "the training, the struggle, the rejections, all of that" — and being a paying customer. But he is also completely on board with space tourists earning the title.

IS SEDITION LAW STILL REQUIRED IN INDEPENDENT INDIA?

Concerned over "**enormous misuse**" of the **colonial era penal law** on sedition, the Supreme Court on 15 July 2021 asked the Centre as to **why it was not repealing the provision** used by the British to "silence" people like Mahatma Gandhi **to suppress freedom movement**.

Agreeing to examine the pleas filed by **Editors Guild of India** and a former major general, challenging the constitutionality of **section 124A (sedition) in the IPC**, a bench headed by Chief Justice N V Ramana said its main concern was the "**misuse of law**" and issued the notice to the Centre.

The **non-bailable provision** makes **any speech or expression** that "**brings or attempts to bring into hatred or contempt or excites or attempts to excite** disaffection towards the Government established by law in India" a criminal offence punishable with a **maximum sentence of life imprisonment.**

Section 124A of the Indian Penal Code (IPC), which deals with sedition, was **drafted by Thomas Babington Macaulay** and **included in the IPC in 1870.**

Section 124A of the IPC, which deals with sedition, states, "**Whoever, words, either spoken or written**, or **by signs**, or **by visible representation**, or **otherwise**, brings or attempts to **bring into hatred or contempt**, or excites or attempts to excite disaffection towards the Government established by law in India shall be punished **with imprisonment for life**, to which fine may be added, or **with imprisonment which may extend to three years**, to which fine may be added, or with fine."

Sedition is a non-bailable offence. Punishment under the law varies from imprisonment up to three years to a life term and fine. **A person charged under this law can't apply for a government job.** They **have to live without their passport** and **must present themselves in the court** as and when required.

Mahatma Gandhi called Section 124A "**the prince among the political sections of the IPC designed to suppress the liberty of the citizen**". Jawaharlal Nehru said that the provision was "**obnoxious**" and "**highly objectionable**", and "the sooner we get rid of it the better". But in **July 2019 Nityanand Rai, minister of state for home affairs**, told the Rajya Sabha that "**there is no proposal to scrap the provision under the IPC dealing with the offence of sedition.** There is a need to retain the provision to effectively **combat anti-national, secessionist and terrorist elements.**"

ZIKA VIRUS CASE

Kerala is on alert after detecting its **first ever positive case of the Zika virus.** State Health Minister Veena George said the infection was reported in a 24-year-old pregnant woman, a native of Parassala, in Thiruvananthapuram. There are **at least 13 other suspected cases.** All 14 samples have been sent to the **National Institute of Virology** in Pune for further testing.

Zika is a viral infection spread **by mosquitoes.** The vector is the **Aedes aegypti mosquito**, which also **spreads dengue and chikungunya**. Additionally, infected people can **transmit Zika sexually. First identified in Uganda in 1947 in monkeys**, **Zika was detected in humans five years later.** Sporadic cases have been reported throughout the **world since the 1960s**, but the **first outbreak happened only in 2007 in the Island of Yap in the Pacific.** In 2015, a major outbreak in Brazil led to the revelation that **Zika can be associated with microcephaly**, a condition in which **babies are born with small and underdeveloped brains.**

Fears around Zika primarily involve **microcephaly**, especially when pregnant women are infected. Generally, the **virus is not considered dangerous to anyone other than pregnant women.** Some countries that have had a **Zika outbreak**, including Brazil, reported a steep increase in **Guillain-Barré syndrome** — a **neurological disorder that could lead to paralysis and death**, according to the World Health Organization (WHO).

In 2017, following a study on Brazil's confirmed cases the **US National Institutes of Health study** estimated the **fatality rate at 8.3 per cent.**

Most people infected with the virus do not develop symptoms. When they are manifested, the **symptoms are similar to those of flu**, including **fever, bodyache**, **headache** etc. If the symptoms worsen, people should seek medical advice. Additional symptoms can include the **occasional rash like in dengue**, while some patients also have **conjunctivitis.** The **incubation period** (the time from exposure to symptoms) of Zika virus disease **is estimated to be 3-14 days.**

Zika has no treatment or vaccine. The **symptoms of Zika virus** are mild and usually require rest, consumption of **plenty of fluids**, and common pain and fever medicines, the WHO says.

A history of Zika virus in India

In India, **Zika virus was first recorded in 1952-53.** The latest major outbreak was in **2018**, when **80 cases were reported in Rajasthan** around the months of September and October. Prior to this, three cases were detected in **Bapunagar area in Gujarat's Ahmedabad district in May 2017.** One case was also reported from Krishnagiri district on Tamil Nadu in July 2017.

Is there a protocol that governments follow when Zika cases are reported?

Governments take **mosquito control measures** such as **spraying of pesticides**, **use of repellents etc.** Because of the possibility of **congenital abnormalities and sexual transmission**, there is also focus on contraceptives. The WHO requires countries to counsel sexually active men and women on the matter to minimise chances of conception at the time of an outbreak.

CRIMINALIZATION IN POLITICS

Recently, the Supreme Court has imposed fine on eight political parties for **committing contempt of court by flouting the directions** in its February 2020 judgment for publication of the **criminal antecedents of candidates**.

Causes

- **Preference given to criminal candidates due to popularity:** The political parties owing to the sentiments of public in a democratic country have time and again chosen candidates who are popular regardless of the criminal antecedents.
- **Unholy nexus between the politicians and bureaucracy:** it is an undesirable and dangerous relationship between bureaucracy and political leaders which opened the doors of criminalization of politics.
- **Social divisions:** Caste and religion both are responsible for the criminalization of politics.
    - In bureaucracy there are certain procedures and rules for the promotion but caste and religion both interfere in this process.
- **Concept of Vote Bank:** The political parties and individual have astronomical expenditure for vote buying and other illegitimate purposes through which these people's are so called goondas.
    - A politician's link with then constituency provides the congenial climate to political crime.
- **Corruption:** It plays very important role in criminalization of politics because a corrupt political member can do anything with their powers.
- **Lack of governance:** In India the distinctive thing is left politics is deep chasm between saying and doing.
    - There is no proper agenda and not following proper functions because of the lack of governance.

Consequences

- **Against the principle of free and fair Election:** Using money and muscle power in election, limits the choice of voters to elect a suitable candidates, and also it is against the ethics of free and fair election which is a bed rock of democracy.
- **Affecting good governance:** A major problem is that the law breakers become Law makers. This affects the efficiency of the democratic process in delivering good governance.
    - These unhealthy tendencies in the democratic system reflect the power image of nature of India's state, Institution and the quality of its elected representatives.
- **Affecting integrity of public servants:** It also leads to increased circulation of black money during and after election which in turn increase corruption in society and affect the working of public servants.
- **Establishing social Dis – harmony:** It introduces a culture of violence in society and set a bad precedent for the youth to follow and reduce people's faith in democracy as a system of governance.
- **Degradation of quality of political parties:** The power becomes an end in itself for political parties and they use all the means at their disposal to obtain power.
    - The rapidly increasing criminalization of politics and widespread use of social media to spread fake news have led to the growing deterioration of quality of election campaigns.

Judicial View

- Each contesting candidate shall **fill up the form as provided by the Election Commission** and the form must contain all the particulars as required therein.
    - It shall state, in bold letters, with regard to the **criminal cases**

pending against the candidate.

- If a candidate is contesting an election on the ticket of a particular party, he/she is **required to inform the party about the criminal cases pending against him/her.**

    - The political party concerned shall be **obligated to put up on its website the aforesaid information** pertaining to candidates having criminal antecedents.

    - The candidate as well as the political party concerned shall **issue a declaration in the widely circulated newspapers** in the locality about the antecedents of the candidate and also give wide publicity in the electronic media.

Addressing Criminalization of Politics in India

- **Easy access to voters on information regarding candidates:** The political parties are to publish information regarding criminal antecedents of candidates on the homepage of their websites, thus making it easier for the voter to get to the information that has to be supplied.

    - The ECI is directed to create a dedicated mobile application containing information published by candidates regarding their criminal antecedents, so that at one stroke, each voter gets such information on his/her mobile phone.

- **Extensive awareness campaign for voters:** It is to be conducted by ECI to make every voter aware about his right to know and the availability of information regarding criminal antecedents of all contesting candidates.

- **Establishment of separate cell to monitor candidates:** The ECI should create a separate cell which will monitor the required compliances so that this Court can be apprised promptly of non-compliance by any political party of the directions contained in this Court's Orders.

- **Forensic Audit of Candidates:** It should be done by an independent authority for a quick resolution for misuse of money power and defections and the audit should be made mandatory when MLAs defect to other parties.
- **Increasing the role of voters:** The voters can play an internal role by raising awareness campaigns regarding the power citizens hold in electing political parties to power.

Road Ahead

- India is the world's largest democratic country and the **faith of the citizenry in its institutions should not be shaken** due to the conduct of persons who have criminal antecedents.
- There is a pressing need for **communicating the true facts concerning those who seek to represent the public** along with the judicial and legislative sanctions against criminalization of politics.
- Candidates and political parties must **give wide publicity to criminal cases pending against him or her,** in the local media, both print and electronic, after he or she files nomination to contest elections.
- Until the citizen realize the people which bring them for **votes cannot be trusted and it will be their ultimate disadvantage**, the efforts to curb criminalization of politics will have limited impact.
    - The voters also need to be **vigilant about misuse of money, gifts and other inducements** during the election.
- There is clear **need of a strong legislation to regulate the functioning of political parties** and an unbiased and independent authority to implement it.

RAMAPPA TEMPLE IN TELANGANA, AND ITS UNESCO TAG

On 25 July 2021, **UNESCO inscribed** the **13th-century Ramappa temple** in **Palampet**, Telangana as a **World Heritage Site**.

A **World Heritage Site is a location** with an "**outstanding universal value**". This signifies "**cultural and/or natural significance** which is **so exceptional as to transcend national boundaries** and to be of **common importance for present and future generations of all humanity**". To be included, sites must meet at least **one of the ten selection criteria**, such as representing a **masterpiece of human creative genius**, or **exhibiting an important interchange of human values** over a span of time or within a cultural area of the world.

The decision **to inscribe the Ramappa temple** was taken at the **44th session** of the **World Heritage Committee of UNESCO** held on 25 July 2021 **in China.**

Prime Minister Narendra Modi tweeted, "**Excellent**! Congratulations to everyone, especially the **people of Telangana.** The **iconic Ramappa Temple** showcases the **outstanding craftsmanship** of **great Kakatiya dynasty.** I would urge you all to visit **this majestic Temple complex** and get a **first-hand experience of it's grandness.**"

The **Rudreswara (Ramappa) Temple** is situated **near Warangal.** An inscription dates it to **1213** and says it was built by a **Kakatiya General Recherla Rudra Reddy**, during the **period of the Kakatiya ruler Ganapati Deva.** "**Ramappa is the main Shiva temple** in a larger walled temple complex, which includes several smaller temples and structures," **Raghvendra Singh**, Secretary, Ministry of Culture (under which the ASI functions), said.

It is **built of sandstone with decorated beams** and **pillars of carved granite** and **dolerite.** The **inner sanctum is made of lightweight porous bricks.** The sculptures, especially bracket figures, have their lustre intact.

The temple was **proposed by the government** as its **only nomination for the UNESCO World Heritage site tag for 2019.** It has been in **UNESCO's tentative list since 2014.**

The **World Heritage Convention's operational guidelines** say that a **tentative list** is like an inventory of properties a country thinks should be on the **World Heritage Site.** After **UNESCO includes a property in the tentative list**, the country prepares a nomination document that will be considered by the UNESCO World Heritage Committee.

In this case, the **nomination was under Criterion I (Masterpiece of human creative genius)** and **Criterion III (bearing a unique or at least an exceptional testimony to a cultural tradition**, which is living or which has disappeared). Earlier, the **International Council of Historic Monuments and Sites (ICOMOS)** had evaluated Ramappa's heritage status.

On 25 July 2021, **17 of the 21 member nations** supported the inscription. With this, **India now has 39 sites on the UNESCO's World Heritage List**, and the **Archaeological Survey of India** is now the **custodian of 23 world heritage sites.**

REVIVING RUSSIA'S ROLE IN THE INDO-PACIFIC

The rise of the Indo-Pacific as a distinct security space presents a **challenge to vital elements of Russia's effort to position itself as a great power** and to balance the West, notably through a close Sino-Russian bilateral relationship.

Revival of Russia's role – Needed

- **Russia's presence in Indo-Pacific region:** Indo-Russian cooperation in the Indo-Pacific region goes back to 1971 when India and the former Soviet Union had signed a Treaty of Peace, Friendship and Cooperation.
- **India wanted Russia in Indo-Pacific region:** India has assured Russia that New Delhi's closeness to Washington will not come at Moscow's cost.
    - In contrast to the US understanding of a "free and open" Indo-Pacific, India has always signalled that it is interested in a "free, open and inclusive" Indo-Pacific which reflects India wanting Russia to be an active player in this region.
- **Russia to make Indo-Pacific multi-polar in nature:** India has tried to rope Russia into its Indo-Pacific initiatives so that the latter emerges as an independent pole outside China's shadow which would make Indo-Pacific multi-polar in nature.
    - The Chennai-Vladivostok maritime route and efforts by India and Japan to invest in Russia's Far East are two such initiatives.
- **Policy of cooperation and competition:** From the Indian perspective, the Indo-Pacific is similar to Russia's Greater Eurasian Partnership whose aim is to avoid Chinese hegemony in Eurasia.
    - In the face of China's advances through the Silk Road Economic Belt in the Russian sphere of influence in Eurasia, Russia has agreed to align its own initiative, the Eurasian Economic Union with China's BRI.

- **India to safeguard its neighbour:** Russia has an opportunity to collaborate with India to shape the emerging order in the Indo-Pacific, which can be done given the historical trust between the two sides.
- **Russia to tackle China's presence in Arctic:** India is not a serious military power as of now in the Pacific but helping its naval capabilities reach that goal would also help Russia in tackling China's challenge to its pre-eminence in the Arctic.

Challenges

- **Polar Silk Route by China:** China defines itself as a "near-Arctic state" and as part of its Polar Silk Road, China's activities would increase in the Arctic in the coming years.
    - The strategic experts in China have even argued that whoever controls the Arctic sea route would control the world economy and China should play an active role in this area.
- **China's larger military reach:** Beijing is a major defence supplier to several of the region's States including Bangladesh, Myanmar, Sri Lanka, Indonesia, Malaysia, the Philippines, and Thailand, dwarfing India's minimal sales, defence dialogues and occasional joint military exercises in the region.
- **Security Issues and Strategic Challenges:** The cheaper imports from China are on a steady growing scale which is not appealing for the domestic economy in developing economies.
    - The nature of the market has taken a hit and now where developing countries fear the danger of zero-sum mercantilism and rising protectionism in western economies.
- **Thucydides Trap:** It should be one of the prominent strategic concerns and security issues at present India face in the region from a major power.
    - This imbalance in the balance of power equations or as Allison puts in a likelihood of conflict cannot be avoided.

- **Debt trap from Chinese assistance:** The US State Department report contains details of how China has ensured that developing countries across Asia and Africa are drawn into a "debt trap", because of the terms of Chinese "assistance".

Russia's opposition to Indo-Pacific Order

- **Rejected American concept of Indo-Pacific:** The Russia sees the Indo-Pacific as an American creation by and hence, Moscow has rejected it outright.
    - At the government level, Russia continues to oppose the Indo-Pacific but academia, think tanks and even the media have started to engage with this idea.
- **Echo of Cold War:** The Indo-Pacific is seen as an echo of the Cold War by the country and Russia is not welcoming the idea of the Indo-Pacific as a new geopolitical construct that would replace the Asia-Pacific.
- **Indo-Pacific Region creates dividing lines:** The Minister of Defense of Russia said that changing the construct from the Asia-Pacific to the Indo-Pacific would only create diving lines and tensions and restrain regional order.
- **Indo-Pacific region unable to serve interest of stakeholders**: The Indo-Pacific concept does not serve the interests of all players, instead only the interests of certain countries.
    - It seems like Russia is rejecting the Indo-Pacific geopolitical construct, which they believe supports the interests of the United States and its allies only.
- **Russia is not welcoming the Indo-Pacific concept:** The country is more concerned with the military issues happening in the western hemisphere, particularly western countries' initiatives to expand North Atlantic Treaty Organization (NATO).

- Russia is afraid that so-called the QUAD grouping might develop in 'ASIAN NATO or NATO alike regional arrangement'.

- **Russia is committed to resisting American unilateralism and the US-centric world order:** Russia views the US' efforts to create the Indo-Pacific concept as a way to build an anti-China alliance and undermine Russia's number one partner.
- **Threatens Russia's goal to build regional ties:** The Indo-Pacific regional concept threatens Russia's goal to build diverse regional partnerships beyond China, particularly China and India.
    - As both India and Japan are members of the QUAD security dialogue, Moscow believes that it might set them against Russia.

Road ahead

- The Indo-Pacific Region is an idea that can **add value to Russian diplomacy in different areas**, including Asia, the Pacific and the Arctic.
- Russia's re-engagement in the region is **driven by economic ambitions** such as exploration and extortion of natural resources, export of energy resources, etc.
    - The country aims to **achieve its position as a corridor between Pacific Asia and Europe** and be a major supplier of energy and agricultural produce to Asian economies.
- The Indo-Pacific is **not just about the US, and Russia's worldview is likely to be incomplete without engaging with the Indo-Pacific** as there's the potential danger of making it dependent on China.
- India advocates a **rules-based Indo-Pacific with freedom of navigation**, open connectivity, and respect for the territorial integrity and sovereignty of all states.

- India and Russia remain supporters of a **multi-polar world order, understanding the constraints that bipolarity would impose** on their foreign policy choices.
- India's and Russia's engagement with other **powers does not come at the expense of their bilateral partnership** while giving the two sides space to strengthen their political, economic, defence and cultural ties in the coming years.

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DECODING THE LEGALITY OF 'AUTHORIZED' SURVEILLANCE IN INDIA

In response to the finding by a **global collaborative investigative project** that **Israeli spyware Pegasus** was used to target at **least 300 individuals in India**, the government has claimed that all interception in India takes place lawfully. So, what are the laws **covering surveillance in India?**

Communication surveillance in India takes place primarily **under two laws** — the **Telegraph Act, 1885** and the **Information Technology Act, 2000.** While the **Telegraph Act deals with interception of calls**, the **IT Act** was enacted to deal with surveillance of **all electronic communication**, following the **Supreme Court's intervention in 1996.** A **comprehensive data protection law** to address the gaps in existing frameworks for surveillance is yet to be enacted.

Telegraph Act, 1885

Section 5(2) of the Telegraph Act reads: "On the occurrence of **any public emergency**, or **in the interest of the public safety**, the Central Government or a State Government or any officer specially authorised in this behalf by the Central Government or a State Government may, if satisfied that **it is necessary or expedient so to do in the interests of the sovereignty and integrity of India**, the security of the State, friendly relations with foreign states or public order or for preventing incitement to the commission of an offence, for reasons to be recorded in writing, by order, direct that any message or class of messages to or from any person or class of persons, or relating to any particular subject, **brought for transmission by** or **transmitted or received by any telegraph**, shall not be transmitted, or shall be intercepted or detained, or shall be disclosed to the Government making the order or an officer thereof mentioned in the order…"

Under this law, the **government can intercept calls only in certain situations** — the **interests of the sovereignty and integrity of India**, the **security of the**

state, **friendly relations with foreign states or public order**, or for preventing incitement to the commission of an offence. These are the same restrictions imposed on **free speech under Article 19(2) of the Constitution.**

Significantly, even these restrictions can be imposed only when there is a condition precedent — the **occurrence of any public emergency**, or in the interest of public safety.

Additionally, a **proviso in Section 5(2)** states that even this lawful interception cannot take place against journalists. "Provided that press messages intended to be published in India of correspondents accredited to the **Central Government or a State Government** shall not be intercepted or detained, unless their transmission has been prohibited under this sub-section."

Supreme Court intervention

In **Public Union for Civil Liberties v Union of India (1996)**, the Supreme Court pointed out **lack of procedural safeguards in the provisions of the Telegraph Act** and laid down certain guidelines for interceptions. A public interest litigation was filed in the wake of the report on "**Tapping of politicians phones**" by the CBI.

The court noted that authorities engaging in interception were not even maintaining adequate records and logs on interception. Among the guidelines issued by the court were **setting up a review committee** that can look into **authorisations made under Section 5(2) of the Telegraph Act.**

"**Tapping is a serious invasion of an individual's privacy.** With the growth of highly sophisticated communication technology, the **right to sold telephone conversation**, in the privacy of one's home or office without interference, is increasingly susceptible to abuse. It is no doubt correct that every Government, however democratic, exercises some degree of subrosa operation as a part of its intelligence outfit but at the same time **citizen's right to privacy has to be protected** from being abused by authorities of the day," the court said.

The **Supreme Court's guidelines** formed the basis of **introducing Rule 419A in the Telegraph Rules in 2007** and later in the **rules prescribed under the IT Act in 2009.**

Rule 419A states that a **Secretary to the Government of India in the Ministry of Home Affairs** can pass orders of interception **in the case of Centre**, and a **secretary-level officer who is in-charge of the Home Department** can issue such directives in the **case of a state government.** In unavoidable circumstances, Rule 419A adds, such orders may be made by an officer, **not below the rank of a Joint Secretary to the Government of India**, who has been duly authorised by the Union Home Secretary or the state Home Secretary.

IT Act, 2000

Section 69 of the Information Technology Act and the **Information Technology (Procedure for Safeguards for Interception, Monitoring and Decryption of Information) Rules, 2009** were enacted to further the **legal framework for electronic surveillance.** Under the IT Act, all electronic transmission of data can be intercepted. So, for a **Pegasus-like spyware to be used lawfully**, the government would have to invoke both the IT Act and the Telegraph Act.

Apart from the restrictions provided in **Section 5(2) of the Telegraph Act** and **Article 19(2) of the Constitution**, Section 69 the IT Act adds another aspect that makes it broader — **interception, monitoring and decryption of digital information** "for the investigation of an offence".

Significantly, it dispenses with the condition precedent set under the **Telegraph Act** that requires "the occurrence of public emergency of the interest of public safety" which widens the ambit of powers under the law.

Identifying the gaps

In 2012, the Planning Commission and the Group of Experts on Privacy Issues

headed by former **Delhi High Court Chief Justice A P Shah** were tasked with **identifying the gaps in laws affecting privacy.**

On surveillance, the committee pointed out **divergence in laws on permitted grounds**, "**type of interception**", "**granularity of information that can be intercepted**", the degree of assistance from service providers, and the "**destruction and retention**" of intercepted material, according to a report by the Centre for Internet & Society.

Although the grounds of selecting a person for surveillance and extent of information gathering has to be recorded in writing, the wide reach of these laws has not been tested in court against the cornerstone of fundamental rights.

INDIA ASPIRING MALARIA-FREE STATUS: THE LONG AND SHORT OF IT

In the past two decades, **path-breaking achievements** have been made **to eliminate malaria.** Globally, with **scientific advancement new knowledge on malaria parasites**, insights into **vector biology** and newer control strategies have helped target interventions resulting in **substantial transmission reduction** leading to disease elimination.

As per the **Global Malaria Report 2020** by the **World Health Organization (WHO)**, in 2019 an estimated **229 million malaria cases and 409,000 deaths** in **87 malaria-endemic countries** are recorded, with a large concentration of the total malaria burden (94%) in Africa. **India shared 2% of the total global malaria cases in 2019.**

Since 1900, **127 countries have registered malaria elimination.** In 2021, two countries **El Salvador on 25 February** and **China on 29 June** were declared **malaria-free by the WHO**.

This is definitely not an easy task. It needs **proper planning and a strategic action plan** based on the local situations. All these countries followed the existing tools and strategies to achieve the **malaria elimination goal.** The main focus was on **surveillance.**

China followed some specific strategies, namely **strong surveillance** following the '**1-3-7'system:** malaria **diagnosis within 1 day**, **3 days for case investigation** and by **day 7 for public health responses**.

Molecular Malaria Surveillance for drug resistance and **genome-based approaches** to distinguish between **indigenous and imported cases** was conducted. All borders to the neighbouring countries were thoroughly screened to prevent the entry of unwanted malaria into the country.

India has a great history of malaria control. The highest incidence of malaria occurred in the 1950s, with an estimated 75 million cases with 0.8 million deaths per year.

The launch of **National Malaria Control Programme in 1953** and the **National Malaria Eradication Programme in 1958** made it possible to bring down malaria cases to 100,000 with no reported deaths by 1961. This is no doubt a great achievement has been made so far.

But from a nearing stage of elimination, **malaria resurged to approximately 6.4 million cases in 1976.** Since then, confirmed cases have decreased to 1.6 million cases, approximately 1100 deaths in 2009 to less than 0.4 million cases and below 80 deaths in 2019.

India accounted for 88% of malaria cases and **86% of all malaria deaths in the WHO South-East Asia Region in 2019** and is the **only country outside Africa** among the **world's 11 `high burden to high impact'** countries.

The road ahead for India:

India is a signatory to National Framework for Malaria Elimination (NFME) 2016-2030 aiming for **malaria elimination by 2030.** This framework has been outlined with a vision **to eliminate disease from the country** which would contribute to improved health with quality of life and poverty alleviation.

India stands at a very crucial stage. The present challenge is the detection of asymptomatic/afebrile cases in most endemic areas.

The current approach for mass screening with **Rapid Diagnostic Tests (RDTs)** would not fulfil the basic purpose because these **tests fail to detect <100 parasites/µL blood** and also the problem of deletion of certain diagnostic genes in the **Plasmodium falciparum dominated areas.** To overcome this, a **microPCR-based point-of-care device** that **detects <5 parasites/µL blood** can be used. The same technology is being used in **Tuberculosis and COVID-19 diagnosis.**

Molecular Malaria Surveillance must be used to find out the **drug-resistant variants** and **genetic-relatedness studies** to find out the imported or indigenous cases.

Finding active and functional gametocyte carriage of **P. falciparum in endemic areas** should be a priority. It has been found that when transmission decreases malaria becomes focal and residual. Surveillance must be strengthened and using **smart digital surveillance devices** would be an important step. **Real-time and organic surveillance** is needed even in remote areas.

The results of each malaria case can be registered in a central dashboard at the **National Vector Borne Disease Control Programme**, as is done for COVID-19 cases by **Indian Council of Medical Research.** All intervention activities must strictly be monitored. **Vector biology**, site of actual vector mosquito bite, host shifting behaviour, feeding time, feeding behaviour and insecticide resistance studies need to be carried out to support the elimination efforts. **Medical entomologists** who would help **accelerate elimination plans** should be appointed at both Central and State levels.

China collaborated with Harvard University and the Massachusetts Institute of Technology, USA for Molecular Malaria Surveillance. In India, there are very dedicated expert scientists who can take up such assignments.

The **entire world is now facing the once in a century pandemic of COVID-19.** This has resulted in an **over 32% decline in total blood smear collection** for **malaria surveillance in 2020 in India** compared to 2019. India has to quickly overcome this and make the elimination process back on track and put all efforts to make India malaria-free by 2030.

THE SHIFT TO ELECTRIC VEHICLES – WHAT IS IN STORE?

Recently, it was reported that 650 of the 8,033 Nexons sold in June 2021 were **Electric Vehicles (EVs)**, that is, had electricity-driven engines.

- It has been ascribed to the fact that thanks to a **spate of central and state government subsidies**, the e-variant now costs only Rs 2 lakh more than the diesel and Rs 3 lakh more than the petrol variant.

Significance of Switching to Electric Vehicles

- **Electric vehicles are saving the climate:** Air pollutants from gasoline- and diesel-powered vehicles cause asthma, bronchitis, cancer, and premature death.
  - The long-term health impacts of localized air pollution last a lifetime, with the effects borne out in asthma attacks, lung damage, and heart conditions.
- **EVs are covering entire gamut of vehicles:** The Electric vehicles fall into three main categories:
  - Battery electric vehicles are powered by electricity stored in a battery pack.
  - Plug-in hybrids combine a gasoline or diesel engine with an electric motor and large rechargeable battery.
  - Fuel cell vehicles split electrons from hydrogen molecules to produce electricity to run the motor.
- **EVs have a smaller carbon footprint than gasoline-powered cars:** The electricity that charges and fuels battery electric and plug-in hybrid vehicles comes from power grids, which rely on a range of sources — from fossil fuels to clean renewable energy.

- The electricity across is cleaner and cheaper as a fuel for vehicles because electric vehicles are more efficient in converting energy to power cars and trucks.

- **Cheaper to maintain:** A Battery Electric Vehicle (BEV) has fewer moving parts than a conventional petrol/diesel car and servicing is relatively easy, less frequent and overall cheaper than a petrol/diesel vehicle.
  - The Plug-in Hybrid Electric Vehicles (PHEVs) also have a petrol or diesel engine that needs servicing, so a PHEV will cost more to maintain than a BEV.
- **Better for our energy security:** The EVs are easy to power from local and renewable energy sources, reducing our dependence on foreign oil.
- **Better for the network:** If EV charging is managed effectively, mainly outside peak electricity demand periods, it will help us to create a flatter electricity network demand profile over a typical 24-hour period.
  - It will help us to:
  - better utilize the electricity network
  - help EV owners avoid higher-cost charging periods
  - help the entire electricity system work more efficiently
  - help support the integration of more small and large-scale renewable energy systems into the electricity grid.

Challenges in Switching to Electric Vehicles

- **Lack of charging infrastructure:** India requires a widespread charging infrastructure to meet the growing adoption of EVs.
  - In addition to more charging stations, the lack of space is also a challenge since people need a place to charge their EVs.
- **Range anxiety:** Potential EV customers are apprehensive when it comes to the range that an EV offers.

- They want to ensure that the vehicle would get them to their destination before the battery runs out.

- **Financing challenges:** EV customers currently face various financing challenges such as limited financing options, high interest, high insurance cost, and limited loan opportunities.
- **Vehicle costs:** Electric cars generally have higher sticker prices than their gasoline-fueled counterparts, mostly because of expensive materials and processes used in battery production.
- **Zero-carbon fantasy:** Sourcing the minerals used for batteries, dismantling batteries which have deteriorated, and building and delivering vehicles to customers worldwide all involve substantial CO2 emissions.

Switching to Electric Vehicles can be problematic, because

- **Hefty subsidies being offered by the government:** The government is subsidizing a small affluent section of the car-owning population.
  - A complete shift to EVs will therefore transfer Rs 2,770 crore from taxpayers to this fraction every year till the government terminates these incentives.
- **Number of security issues:** The electric and hybrid vehicles have a number of security issues that are not related to conventional vehicles, and include electric shock, explosion, flood of the electrolyte and fire.
- **Uncertainty associated with the state of the battery after mechanical damage:** The connectors may be defective and to lose communication with one or all parts of the battery with unknown amount of energy remaining in the system.
  - The issues related to the malfunction of the battery after damage will be evidence of leakage, leaking electrolyte (carbon solvents are flammable), thermal hazards (observed battery temperatures exceeding 1200˚C after malfunction) and hazard particles.

- **High global warming emission during manufacturing:** The electric vehicles will produce more global warming emissions than the average gasoline vehicle, because electric cars' large lithium-ion batteries require a lot of materials and energy to build.
- **Insurance implications and claims complexity:** Fire and explosion risks associated with high voltage batteries could give rise to claims for commercial property insurers, in particular if multiple cars are charged in underground car parks.

Alternative Measures for Switching to Electric Vehicles

- **Ethanol and methanol as transport fuel:** Their superior quality and greater safety has made them the preferred fuels in major motor races since the 1960s.
  - They can be produced from any biomass waste from crop residues to municipal solid waste, both of which are available in abundance.
- **Production of refuse-derived fuel:** The first commercial plant to convert 175,000 tons of refuse-derived fuel into 45 million litres of aviation turbine fuel is being commissioned outside Reno, Nevada.
- **Gasification:** It holds even greater promise because simple, air-blown gasifiers are already in use in food processing that can convert rice and wheat straw into a lean fuel gas that can generate electricity and provide guaranteed 24-hour power to cold storage in every village.
  - A by-product, biochar, is no less valuable because it can replace imported coking coal in blast furnaces or be used as a feedstock for producing transport fuels even more easily than municipal solid waste.

Road ahead

- **Standardized location of switches:** The manufacturers of electrical vehicles install switches that will stop the energy from the battery case in accident.
  - The location of these switches must be standardized for security.
- It is expected in the **next 20 years the number of small light electric vehicles (SEVs) to significantly increase** and become future solution for urban mobility because of their dimensions.
- The **protection of vulnerable road users, compatibility with heavier vehicles and new active safety systems** must be taken into account to ensure adequate security of EVs in the future regulations.
- The Government's vision to **touch a 25% registration mark by 2024 is a quite practical approach** and will help the city in curbing other concerning factors including generating employment opportunities, pollution levels, etc.
- The states need to start **planning for the proliferation of electric vehicle chargers in both public spaces** as well as **privately owned overnight chargers.**

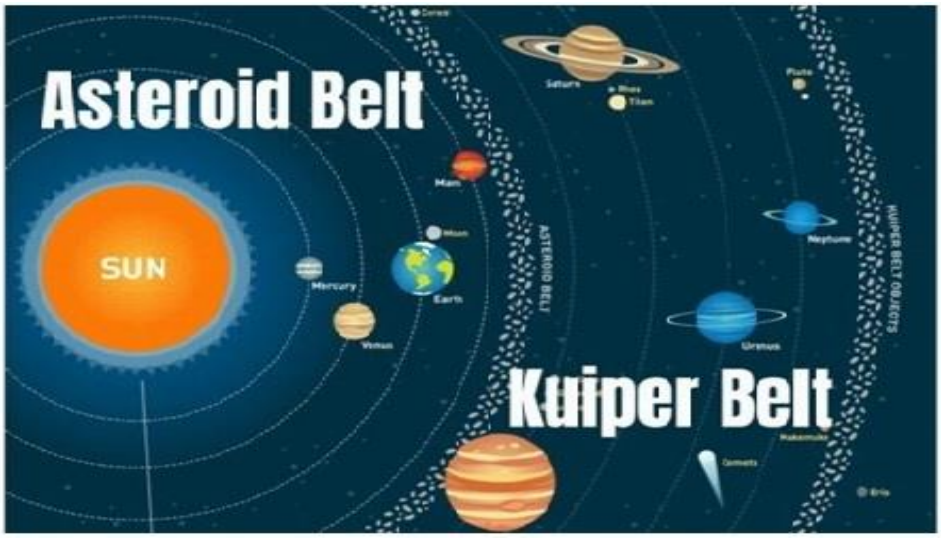
WHAT MAKES NASA'S NEW SPACECRAFT NEA SCOUT SPECIAL?

In July, NASA announced that its **new spacecraft**, named **NEA Scout**, has completed all required tests and has been safely tucked inside the **Space Launch System (SLS) rocket. NEA Scout is one of several payloads** that will hitch a **ride on Artemis I**, which is expected to be launched in November.

Artemis I will be an uncrewed testflight of the **Orion spacecraft and SLS rocket.** Under the Artemis programme, NASA has aimed to land the **first woman on the Moon in 2024** and also establish **sustainable lunar exploration programs by 2030.**

Near-Earth Asteroid Scout, or NEA Scout, is a **small spacecraft**, about the size of a big shoebox. Its **main mission is to fly by** and **collect data from a near-Earth asteroid.** It will also be **America's first interplanetary mission using a special solar sail propulsion.**

Les Johnson, principal technology investigator for the mission, said in a release, "This **type of propulsion is especially useful for small, lightweight spacecraft** that cannot carry large amounts of conventional rocket propellant."



NEA Scout will use stainless steel alloy booms and deploy an **aluminum-coated sail** measuring 925 square feet. "**The large-area sail will generate thrust by reflecting sunlight.** Energetic particles of sunlight bounce off the solar sail to give it a gentle, yet constant push. Over time, **this constant thrust can accelerate the spacecraft to very high speeds**, allowing it to navigate through space and catch up to its target asteroid," explained NASA in the release.

The **spacecraft will take about two years** to **cruise to the asteroid** and will be about 93 million miles away from Earth during the asteroid encounter.

NEA Scout is equipped with special cameras and can take pictures **ranging from 50 cm/pixels to 10 cm/pixels.** It can also process the image and reduce the file sizes before sending them to the **earth-based Deep Space Network** via its medium-gain antenna.

"The images gathered **by NEA Scout** will provide critical information on the **asteroid's physical properties** such as **orbit, shape, volume, rotation, the dust and debris field surrounding it**, plus its surface properties," said Julie Castillo-Rogez, the mission's principal science investigator at **NASA's Jet Propulsion Laboratory (JPL).**

Why should we study near-Earth asteroids?

"**Despite their size**, some of **these small asteroids could pose a threat to Earth**," Dr. Jim Stott, NEA Scout technology project manager, said. "Understanding their properties could help us develop strategies for reducing the potential damage caused in the event of an impact." Scientists will use this data to determine what is required to reduce risk, **increase effectiveness**, and **improve the design** and operations of robotic and human space exploration, added Castillo-Rogez.

PEGASUS: A SPY THAT WON'T WAIT; WILL DIE BEFORE IT IS EXPOSED

Zero-click installation that requires **no action by the target** is not the only ability that makes Pegasus the **super spyware it is.** What also makes it unique is the capability of "**active collection**", which gives attackers the power to "**control the information**" they want to collect from the targeted device.

This set of features, says a marketing pitch of the **Israeli company NSO Group** that developed Pegasus, are called "**active as they carry their collection upon explicit request of the operator**", and "**differentiates Pegasus from any other intelligence collection solution**", that is, spyware.

"Instead of just waiting for information to arrive, hoping this is the information you were looking for, the **operator actively retrieves important information from the device**, getting the exact information he was looking for," the NSO pitch says.

'Active' data extraction

The NSO Group categorises the snooping into **three levels: initial data extraction**, **passive monitoring**, and **active collection.**

Unlike other spyware that provide **only future monitoring of partial communications**, says NSO, Pegasus allows the extraction of all existing, including historical, data on the device for "**building a comprehensive and accurate intelligence picture**." The initial extraction sends SMS records, contacts, call history (log), emails, messages, and browsing history to the command and control server.

While Pegasus monitors and **retrieves new data real-time** — or periodically if configured to do so — from an **infected device**, it also makes available a whole set of active collection features that allow an attacker to take **real-time actions on the target**, and **retrieve unique information** from the device and the surrounding area in its location.

Such active extractions include:

GPS-based location tracking: If GPS is **disabled by a target** Pegasus enables it for sampling and immediately turns it off. If no GPS signal is accessible, **Cell-ID is retrieved.**

Environmental sound recording: Pegasus ascertains if the phone is in **idle mode** before turning on the microphone through an incoming silent call. Any action by the target that turns on the phone screen results in **immediate call hang-up** and terminates recording.

Photo taking: Both **front and rear cameras** can be used after **Pegasus ascertains that the phone is in idle mode.** The quality of the photo can be pre-determined by an attacker to reduce data use and ensure faster transmission. NSO cautions that since the flash is never used and the phone might be in motion or in a low-lit room, photos can at times be out of focus.

Rules and alerts: A number of conditions can be pre-set for real-time action, such as **geo-fencing alerts** (target enters or exits a defined location), **meeting alerts** (when two devices share the same location), **connection alert** (a call or message sent or received to/from a specific number), and **content alert** (a specific word used in a message), etc.

Invisible transmission

The **transmitted data is encrypted with symmetric encryption AES 128-bit.** Even while encrypting, says NSO, extra care is taken to ensure that **Pegasus uses minimal data, battery, and memory** to make sure that the target does not get suspicious.

This is the reason **why Wi-Fi connections are preferred for transmitting** the collected data. NSO says it has put "**extra thought into compression methods** and focusing on textual content transmission whenever possible" to minimise data

footprints to only a few hundred bytes and to ensure minimal impact on the target's cellular data plan.

Data transmission stops automatically when the battery level is low, or when the target is roaming. When transmission is not possible, Pegasus stores the collected data in a **hidden and encrypted buffer** which is set to reach no more than 5 per cent of the free space available on the device. Under rare circumstances when no transmission is possible **through safe channels**, an attacker can collect urgent data through text messages but this, warns NSO, **may incur costs that appear on the target's phone bill.**

The communication between **Pegasus and the central servers** takes place through the **Pegasus Anonymizing Transmission Network (PATN)**, which makes tracing back to the origin "**non-feasible**". The PATN nodes, says NSO, are spread across the world, redirecting Pegasus connections through different paths prior to reaching the Pegasus servers.

Self-destruct function

Pegasus comes complete with an **efficient self-destruct mechanism.** In general, says NSO, "we understand that it is more important that the source will not be exposed and the target will suspect nothing than keeping the agent alive and working." **Any risk of exposure automatically activates the self-destruct mechanism**, which also comes into effect if Pegasus does not communicate with its server from an infected device for 60 days or a customised period of time.

There is a **third scenario in which the self-destruct mechanism is activated.** From the day it released Pegasus, the NSO Group has not allowed Pegasus to infect American phone numbers. The company does not even allow infected phones to travel to the United States. The moment a victim enters the US, **Pegasus in her device goes into self-destruct mode.**

800-YEAR-OLD RAMAPPA TEMPLE'S UNIQUE SANDBOX TECHNOLOGY AND 'FLOATING BRICKS' HELPED IT GET THE UNESCO TAG

On 25 July 2021, **UNESCO inscribed** the **13th-century Ramappa temple** in **Palampet**, Telangana as a **World Heritage Site**.

A **World Heritage Site is a location** with an "**outstanding universal value**". This signifies "**cultural and/or natural significance** which is **so exceptional as to transcend national boundaries** and to be of **common importance for present and future generations of all humanity**". To be included, sites must meet at least **one of the ten selection criteria**, such as representing a **masterpiece of human creative genius**, or **exhibiting an important interchange of human values** over a span of time or within a cultural area of the world.

The decision **to inscribe the Ramappa temple** was taken at the **44th session** of the **World Heritage Committee of UNESCO** held on 25 July 2021 **in China.**

Prime Minister Narendra Modi tweeted, "**Excellent**! Congratulations to everyone, especially the **people of Telangana.** The **iconic Ramappa Temple** showcases the **outstanding craftsmanship** of **great Kakatiya dynasty.** I would urge you all to visit **this majestic Temple complex** and get a **first-hand experience of it's grandness.**"

The **Rudreswara (Ramappa) Temple** is situated **near Warangal.** An inscription dates it to **1213** and says it was built by a **Kakatiya General Recherla Rudra Reddy**, during the **period of the Kakatiya ruler Ganapati Deva.** "**Ramappa is the main Shiva temple** in a larger walled temple complex, which includes several smaller temples and structures," **Raghvendra Singh**, Secretary, Ministry of Culture (under which the ASI functions), said.

It is **built of sandstone with decorated beams** and **pillars of carved granite** and **dolerite.** The **inner sanctum is made of lightweight porous bricks.** The sculptures, especially bracket figures, have their lustre intact.

- The Rudreswara temple was **constructed in 1213 AD during the reign of the Kakatiya Empire by Recherla Rudra,** a general of Kakatiya king Ganapati Deva.
- The presiding deity here is **Ramalingeswara Swamy.**
- It is also known as the **Ramappa temple, after the sculptor** who executed the work in the temple for 40 years.
- The temple stands on a **6 feet high star-shaped platform** with walls, pillars and ceilings adorned with **intricate carvings** that attest to the unique skill of the Kakatiya sculptors.
- The foundation is built with the **"sandbox technique",** the flooring is granite and the pillars are basalt.
- The **lower part of the temple is red sandstone** while the **white gopuram** is built with light bricks that reportedly float on water.
- An inscription dates the temple to **1135 Samvat-Saka on the eight-day of Magha** (12th January, 1214).
- The distinct style of Kakatiyas for the gateways to temple complexes, unique only to this region, confirm the **highly evolved proportions of aesthetics in temple** and town gateways in South India.
- European merchants and travellers were mesmerized by the beauty of the temple and one such traveller had remarked that the temple was the **"brightest star in the galaxy of medieval temples of the Deccan".**

The temple dedicated to Shiva is often described as the brightest star in the galaxy of the medieval temples of the Deccan. It reflects a repository of Kakatiyan creative genius, with its intricate carvings adorning the walls, pillars and ceilings of the marvelous edifice. It was built in 1213 AD by Recharla Rudra, the general of King Ganapathi Deva. Though the presiding deity here is Ramalingeswara Swamy, the temple was named after the sculptor Ramappa, who completed the task in 14 years. Built with sandstone and a sandbox foundation, the temple has decorated beams and columns made of granite stone.

Significantly, the temple sits on a six-foot-high star-shaped platform, endowed with a 10 feet wide *pradakshina patha* (corridor) with walls, pillars and ceilings adorned with intricate carvings. There is a hall in front of the sanctum sanctorum with four black polished pillars which are placed with mathematical precision.

The three-storied *shikhara* or *vimana* of the temple is completely brick-built so as not to burden the structure below. The lightweight porous floating bricks used in the temple's construction were never heard of before. "It is the culmination of the experiments with different types of bricks, starting from the Satavahana times in Telangana. These floating bricks are made of clay mixed with acacia wood, chaff, myrobalan and ushira, also known as vatti verlu, making the brick very light, and enabling it to float on water.

Pillars reflect light onto sanctorum: "The presiding deity in the temple is Lord Shiva. In a significant architectural feat, daylight is reflected by the four granite pillars in the sanctorum which is diverted towards the inner sanctum, keeping it illuminated the whole day," explained BV Papa Rao, a retired IAS officer, who along with the professor floated the heritage trust.

Musical pillars: A pillar has the sculpture of Lord Krishna. He can be seen sitting on a tree playing his flute denoting the mythological tale of Gopika Vastrapaharanam. Saptaswaras (Sa Ri Ga Ma Pa Da Ni Sa) can be heard by tapping the sculpture of the lord.

Warding off the evil eye: A portion of the main pillar inside the sanctorum is a little flawed. The carvings are misplaced. In fact, the portion also has a slight dent to it. Sculptor Ramappa intentionally left the space blank to ward off the evil eye, according to locals.

13 needle holes: There is a fine carving on one of the pillars which is shaped like a bangle. It has 13 holes which, according to legend, indicate Lord Shiva's Trayodashi (13 in Sanskrit). "According to Hindu mythology, Lord Shiva defeated demons on Trayodashi to save other sages. The 13 thin-threaded holes between the stone pillars reflect the richness of the architecture of Kakatiya kings. Only a small thread or a needle can pass through the holes of the sculpture. It is unclear as to how there were specific tools in the 13th century to carve this out," said Papa Rao.

Optical illusion: There is one carving where there are three dancers in the middle but there are only four legs. If you close the body of the middle dancer, you can see two girls dancing. But when you close the bodies of the girls on either side, the middle legs become the legs of the dancer in between.

Thank you, elephants: "There are 526 elephants (adding up to 13, the significance of which is explained above), carved on the outer walls of the temple. The startling fact is that each elephant is chipped differently. This was done to acknowledge the contribution of elephants in building the temple and transporting the granite stone. Also, the elephants face clockwise, indicating the ritual of Hindus walking in that direction around a shrine," said Prof Panduranga Rao.

Egyptian and Persian carvings: The figurines carved in sandstone all around the temple feature Persian men, Egyptian Pharaohs, among others, pointing to the trade relations the Kakatiyas had with these countries during the 13th century. There are also some sculptures of Jains and Buddhists.

Mandakinis: There are 12 black stone statues of mandakinis (dancing figures) perched atop pillars of the temple. Each figure has a distinct feature with the one named, Ragini, wearing high heels. "The work is so intricate that on one mandakini, there is a shadow of a necklace worn by her which looks natural but is actually carved out. Irrespective of the angle of the sun, we can see the shade on her body," explained Papa Rao.

Kakatiya emblem: "You can also find carvings and statues of elephants and lions on the walls and pillars here. The foot is shaped like an elephant trunk, in the middle is a human shoulder and the top is a lion's face. That is called Gaja Kesari which is the Kakatiya dynasty's emblem. It is symbolic of their valour," Papa Rao said.

The temple is built with three different coloured stones (red, white and brown), with the colours merged on a single stone.

The temple was **proposed by the government** as its **only nomination for the UNESCO World Heritage site tag for 2019.** It has been in **UNESCO's tentative list since 2014.**

The **World Heritage Convention's operational guidelines** say that a **tentative list** is like an inventory of properties a country thinks should be on the **World Heritage Site.** After **UNESCO includes a property in the tentative list**, the country prepares a nomination document that will be considered by the UNESCO World Heritage Committee.

In this case, the **nomination was under Criterion I (Masterpiece of human creative genius)** and **Criterion III (bearing a unique or at least an exceptional testimony to a cultural tradition**, which is living or which has disappeared). Earlier, the **International Council of Historic Monuments and Sites (ICOMOS)** had evaluated Ramappa's heritage status.

On 25 July 2021, **17 of the 21 member nations** supported the inscription. With this, **India now has 39 sites on the UNESCO's World Heritage List**, and the **Archaeological Survey of India** is now the **custodian of 23 world heritage sites.**

Sandbox Technique

- The technique involved filling the pit — **dug up for laying the foundation** — with a mixture of **sand-lime, jaggery (for binding) and karakkaya** (black myrobalan fruit) before the buildings were constructed on these 'sandboxes'.
- The sandbox in the foundation acts as a **cushion in case of earthquakes.**
- Most of the vibrations caused by earthquakes lose their strength while passing through the sand by the time they reach the actual foundation of the building.

WHY ARE THE STARS, PLANETS AND MOONS ROUND, EVEN AS COMETS AND ASTEROIDS ARE IRREGULAR IN SHAPE?

When we look out at the **Solar System**, we see objects of all sizes — from **tiny grains of dust**, to **giant planets and the Sun.** A common theme among those objects is the **big ones are (more or less) round**, while the small ones are **irregular.** But why?

The answer to **why the bigger objects are round boils down to the influence of gravity.** An **object's gravitational pull will always point towards the centre of its mass.** The bigger something is, the **more massive it is**, and the **larger its gravitational pull.**

For solid objects, that **force is opposed by the strength of the object itself.** For instance, the **downward force** you experience due to **Earth's gravity doesn't pull you into the centre of the Earth.** That's because the ground pushes back up at you; it has too much strength to let you sink through it.

However, **Earth's strength has limits.** Think of a great mountain, such as **Mount Everest**, getting larger and larger as the **planet's plates push together.** As **Everest gets taller**, its **weight increases to the point at which it begins to sink.** The extra weight will push the mountain down into Earth's mantle, limiting how tall it can become.

If **Earth were made entirely from the ocean**, Mount Everest would just sink down all the way to Earth's centre (displacing any water it passed through). **Any areas where the water was unusually high would sink**, pulled down by **Earth's gravity.** Areas, where the water was unusually low, would be filled up by water displaced from elsewhere, with the result that this imaginary ocean Earth would become perfectly spherical.

But the thing is, **gravity is actually surprisingly weak.** An object must be really big before it **can exert a strong enough gravitational pull to overcome the strength of the material** from which it's made. Smaller solid objects (metres or kilometres in diameter) therefore **have gravitational pulls that are too weak to pull them into a spherical shape.**

This, incidentally, is **why you don't have to worry about collapsing into a spherical shape under your own gravitational pull** — your body is far too strong for the tiny gravitational pull it exerts to do that.

Reaching hydrostatic equilibrium

When **an object is big enough that gravity wins** — overcoming the strength of the material from which the object is made — it will tend to pull the **entire object's material into a spherical shape.** Bits of the object that are too high will be pulled down, displacing material beneath them, which will cause areas that are too low to push outward.

When that **spherical shape is reached**, we say the object is in "**hydrostatic equilibrium**". But **how massive must an object be to achieve hydrostatic equilibrium?** That depends on what it's made of. An object made of **just liquid water would manage it really easily**, as it would essentially have no strength — as water's molecules move around quite easily.

Meanwhile, **an object made of pure iron would need to be much more massive for its gravity to overcome the inherent strength of the iron.** In the Solar System, the threshold diameter required for an icy object to become spherical is at least **400 kilometres** — and for objects made primarily of stronger material, the threshold is even larger.

Saturn's moon Mimas, which looks like the **Death Star**, is spherical and has a **diameter of 396km.** It's currently the smallest object we know of that may meet the criterion.

Constantly in motion

But **things get more complicated** when you think about the fact that **all objects tend to spin or tumble through space.** If an object is spinning, locations at its equator (the point halfway between the two poles) effectively feel a slightly reduced **gravitational pull compared to locations near the pole.**

The result of this is the **perfectly spherical shape** you'd expect in **hydrostatic equilibrium is shifted** to what we call an "**oblate spheroid**" — where the object is wider at its equator than its poles. This is true for our spinning Earth, which has an **equatorial diameter of 12,756km** and a **pole-to-pole diameter of 12,712km.**

The **faster an object in space spins**, the **more dramatic this effect is.** Saturn, which is less dense than water, spins on its axis every ten and a half hours (compared with Earth's slower 24-hour cycle). As a result, **it is much less spherical than Earth.**

Saturn's equatorial diameter is just above 120,500km — while its polar diameter is just over 108,600km. That's a difference of almost 12,000km!

Some stars are even more extreme. The **bright star Altair**, visible in the northern sky from Australia in winter months, is one such oddity. It spins once every nine hours or so. That's so fast that its **equatorial diameter is 25% larger than the distance between its poles!**

The short answer

The closer you look into a question like this, the more you learn. But to answer it simply, **the reason big astronomical objects are spherical** (or nearly spherical) is because **they're massive enough that their gravitational pull can overcome the strength of the material they're made from.**

COULD BALLOONS POWER UNCENSORED INTERNET IN CUBA?

Florida's Republican governor, **Ron DeSantis**, called In July 2021 on the administration of President Joe Biden to **greenlight a plan to transmit the Internet to people in Cuba** via **high-altitude balloons** when their government has blocked access.

Can the Internet be delivered by balloon?

Yes. For years, **Alphabet** — the **parent company of Google** — worked to perfect an **Internet-balloon division service** called **Loon.** It shut down that project in **January**, saying **it wasn't commercially viable.**

Prior to the shutdown, **Loon balloons had been providing service in mountainous areas in Kenya** through a **partnership with a local telecom**, **Telkom Kenya.** The service also helped **provide wireless communications in Puerto Rico** in the aftermath of **Hurricane Maria**, which destroyed the **island's mobile network.** Loon partnered with AT&T to make service available.

How does that work?

The **Loon balloons were effectively cell towers** the **size of a tennis court.** They **floated 60,000 to 75,000 feet (18,000- 23,000 meters)**, above the Earth, **well above commercial jetliner routes.** Made of the commonplace **plastic polyethylene**, the **balloons used solar panels for electricity** and **could deliver service to smartphones** in partnership with a local telecom.

Each balloon could serve thousands of people, the company said. But they had to be **replaced every five months** or so because of the **harsh conditions in the stratosphere.** And the balloons could be difficult to control. "**Navigating balloons through the stratosphere has always been hard**," wrote Salvatore Candido, who had been chief technology officer for Loon, in a December 2020 blog post. The company created **algorithms that tracked wind patterns.**

What equipment was required?

Loon had said that beyond the balloons themselves, it needed **network integration with a telecom** to provide service and **some equipment on the ground in the region.** It also needed permission from local regulators — something that the **Cuban government isn't likely to grant.**

Could a network be set up from afar?

Yes. Loon used multiple balloons to extend connections beyond the necessary ground link. **In one 2018 test**, Loon said the **connection jumped 1,000 kilometers over 7 balloons.** Another time, it bridged a **wireless connection over 600 kilometers between two balloons. Cuba and Florida** are only about 100 miles (160 kilometers) apart at their closest.

Is that feasible?

But experts aren't sure **it would be that easy to set up a guerrilla Internet service for Cuba this way.** It would need an **unused band of spectrum**, or **radio frequencies**, to **transmit a connection to Cuba**, and spectrum use is typically controlled by national governments. Anyone trying this would have to find a **free block of spectrum** that wouldn't be interfered with, said Jacob Sharony, of Mobius Consulting, a mobile and wireless consulting firm.

Balloon– or **drone-powered networks** aren't likely to be economical over the long term, said Tim Farrar of TMF Associates, a satellite communications consultant. While **they're suitable for bridging communications amid disasters** or in war zones, the transmission capabilities of such networks aren't large — "certainly not enough to serve the entire population of Cuba or anything like that," Farrar said.

Who is involved in the Cuba effort?

DeSantis promoted the balloon idea alongside two Cuban-American members of Congress from the **Miami area**, Represenatatives Maria Salazar and Carlos Gimenez, FCC commissioner Brendan Carr and Cuban-American lawyer, businessman and museum director Marcell Felipe.

Felipe said he has been talking for about two years with a defense contractor who could **deploy such balloons in a cost-effective way in airspace near Cuba**, but declined to name the company. Felipe said his **idea would involve transmitting Internet connectivity directly to mobile phones** on the island without the **participation of any ground provider.** In comments to The Associated Press, Felipe claimed **it wouldn't be feasible for the Cuban government** to block these balloon-delivered signals "**in any significant manner**". Though he didn't cite any evidence.

None of the supporters provided a cost estimate. Salazar said that **if the federal government endorsed the plan**, she believes it could be funded entirely with contributions from members of the **Cuban diaspora if necessary.**

What is Internet access like in Cuba?

Internet access in Cuba has been **expensive and relatively rare until recently. Starting in December 2018**, Cubans could get Internet access on their phones through the state telecom monopoly. More than half of Cubans today have Internet access.

But the **Cuban government restricts independent media** and censors **what's available to Cubans online**, according to **Human Rights Watch.** It disrupts Internet access in an attempt to head off protests.

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