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MINISTRY OF SCIENCE AND TECHNOLOGY

MK Yadav Sir

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PIB Aug 23

DEEN DAYAL SPARSH YOJANA
(Syllabus: GS Paper 2 – Education)

Deen Dayal SPARSH Yojana scholarship by India Post to inculcate the hobby of Philately among the students – Postmaster General Sh. Krishna Kumar Yadav

Context: India Post's Deen Dayal SPARSH Yojana scholarship aims to foster a passion for philately among students, encouraging them to develop this hobby.

Deen Dayal SPARSH Yojana

- **Launched by:** Department of Posts, Ministry of Communications.
- **Objective**: To "Promote Philately among children at a young age in a sustainable manner that can reinforce and supplement the academic curriculum in addition to providing a hobby that can help them relax and de-stress".
- **Class Category**: Standard 6th to 9th.
    - It is proposed to award annual scholarships to students who have good academic records and are also pursuing 'Philately' as a hobby.
- **Eligibility**:
    - The applicant should be studying in a recognized school in India.
    - The school should have a Philately Club and the candidate should be a member of that Club.
    - In case the School Philately Club hasn't been established, a student having his own Philately Deposit Account may also be considered.
    - The applicant should have scored at least 60% marks or equivalent grade/ grade point in the recent final examination.
- **Benefits**:
    - **Amount of Scholarship**: ₹6,000 per annum, distributed as ₹500 per month, with payments made quarterly (₹1,500 per quarter) by IPPB/POSB.
    - **Renewability:** Scholarship is valid for one year, but students may reapply for subsequent years if they meet the criteria.
    - **Philately Mentor Assignment:** Schools participating in the competition will be assigned a Philately Mentor, a renowned philatelist, to assist in forming Philately Clubs and guide students in their philatelic projects and hobby development.

INDIAN EXPRESS

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HAMPI SITE

(Syllabus GS Paper 2 – Art and Culture)

Keeping an empire alive

When a temple pavilion in Hampi collapsed in the rains, questions were raised about the alleged neglect of one of India's largest World Heritage Sites. ADRIJA ROYCHOWDHURY travels to Hampi, the once-vibrant city that was at the heart of the Vijayanagara empire, to know what it takes to keep it standing

MONUMENTS ARE every-where in Hampi. Stone-strewn tall and elegant against the backdrop of giant granite boulders, others lie low and truncated. There are sculptures of elephants with missing trunks, court musicians with an amputated limb or nose — reminding the visitor of the devastation caused by a 16th century war to this once prosperous and powerful capital city of the Vijayanagara Empire. There there are the other monuments — those that peek out from behind thick foliage and debris, waiting to be rescued through the explorations and conservation efforts that have been on since the 19th century.

Earlier this year, when the rains swamped a pavilion at the Virupakshia temple in Hampi and collapsed, questions and concerns were raised about the alleged neglect of the World Heritage Site.

The conservation of Hampi is an exercise with few parallels, at least among India's heritage sites. A variegated list of around 1,600 monuments, spread across an area of 250 square kilometres, makes Hampi one of the largest such sites in India to receive a UNESCO tag. Of these 1,600 or so protected monuments, there are about 30 villages and their people whose lives and livelihoods are intimately tied to the monument ruins.

Through the entire arsenic regulated by the World Heritage tag — given to Hampi in 1986 — these 30 villages are spread across two separate districts, Vijayanagara and Koppal, and are governed by their respective administrative bodies. The Archaeological Survey of India (ASI) and the Karnataka government's Department of Archaeology that has the painstaking task of keeping the monuments alive through a rigorous conservation process.

Despite these ground realities and multiple stakeholders, what makes Hampi fascinating is that it is a living, breathing city. And a person that has been on for decades. As Anuradha Venkataramanan's beautiful novel will you, "a lot more remains to be known".

The story of Hampi — and its rediscovery

Known to be the last great Hindu medieval kingdom, the Vijayanagara empire was founded in 1336 by Harihara I and Bukka I and Bukka I, two of the Sangama dynasty. At its peak, the empire is known to have extended across almost all of southern India.

The spectacular city of Vijayanagara — or what we today know as Hampi — was the empire's capital. Its magnificence was noted by several foreign travellers visiting the region, among them Portuguese Domingo Paes and Persian Abdur Razzak. Paes had wrote about the city that was "as large and beautiful as Rome". The city, on the banks of the Tungabhadra, has also been the subject of numerous books, including Salman Rushdie's latest Victory City, a fictionalised reinterpretation of the rise and fall of the Vijayanagara empire.

The glorious days of Vijayanagara, though, were short-lived. In 1565, a five-member armies of the Deccan Sultanates are said to have smashed the capital after defeating Rama Raya, the de facto ruler of the empire then.

"It is said that the city burned for six months after the battle," says Kishore Rao, an ASI official at Hampi.

Although historians say that the nature and scale of destruction carried out at Hampi by the armies of Talikota is debatable, everyone agrees that the site was practically untouched and largely forgotten till the end of the 18th century when the British first began exploring it. The British antiquarian Colin Mackenzie, who went on to become the first surveyor-general of India, made the first map of Hampi in 1799. He also produced a manuscript of numerous paintings of the monuments in the city.

In the years that followed, there was a steady increase in British explorers and photographers at Hampi. Among them was Alexander Greenlaw, who is known to have taken some of the earliest photographs of the Hampi ruins in the 1850s, much before any of the clearing or excavation work took place.

It is also around this time that the ruins in the British also engaged in some amount of early restoration. "For instance, in the Virupakshia temple's gopuram, one can see a steel rod from 1856 with the mark 'Made in England' on it," says ASI's Rao. "It was put there by the British to support the gateway that would have otherwise collapsed."

AN EMPIRE LOST — AND FOUND

1336CE
Vijayanagara empire is established by the Sangama dynasty

1509CE
The beginning of the reign of Krishna Devaraya, under whom the empire reached its peak, spreading across almost all of southern India. His reign ended in 1529 CE

1565CE
Battle of Talikota, in which the Vijayanagara empire is defeated by the alliance of the Deccan Sultanates. Marks the beginning of the end of the empire that's now in ruins

1646CE
After successive defeats in battles with the Bijapur Sultanate, the Vijayanagara empire ends

1799CE
British surveyor-general Colin Mackenzie makes the first map of Hampi

1860sCE
British explorer and photographer Alexander Greenlaw takes some of the earliest photographs of Hampi

1976
Clearing-up by Hampi Heritage Project, the first conservation effort to excavate and conserve Hampi

1986
Hampi is UNESCO World Heritage Site

The Virupakshia temple in Hampi. Earlier this year, a mantapa here collapsed

One of the mantapas, now in ruins, at the Hampi bazaar. Adrija Roychowdhury

Raghavand. Historian Vasundhara Filliozat, who has been studying Hampi since the 1960s, says that "instead of systematic excavations, what we see in Hampi, we encounter something new," says Das. "Since the site is on vast, we decided that it is better to first conserve what we have already found before digging any further," he adds.

A fight to keep the ruins alive

One of the conditions of the 1986 World Heritage tag was that both the ASI and the State Department of Archaeology instituted their conservation efforts.

A part of the conservation was directed at repairing the destructions caused by the war centuries ago. The chariot at the centre of the Vittala temple, for instance, shows remnants of a pair of horse sculptures that was built probably around the 16th century. Efforts have replaced the horses with two elephants plucked out from some other part of the monument.

Mitchell suggests that some of these efforts may have been misguided. "You cannot make Hampi new. All you can do is understand what happened and appreciate it," he says. The work is an episode from the 1960s, when the "instinct of systematic exca-

wherever we dig in Hampi, we encounter

regulations," he argues.

The chief Hindu Ali Akram Shah, executive secretary of HWAMAA, however, says that those who were moved out of the heritage site were eventually rehabilitated in villages away from the site. "People had encroached the pavilions and pillars at the temple site. They had constructed even concrete houses and amenities as well as a separate site for commercial activities."

INTACH's Pasricha believes that the conservation of Hampi needs to be more organic, one which involves active local engagement. "The collapse of a mantapa or a pillar can always be fixed. The bigger concerns are environmental degradation and the lack of conservation architects and urban planners in the planning. Hampi needs better sanitation, green mobility plans and architectural guidelines. The pillars of Hampi are, after all, its people and this ancient and rich landscape they inhabit," she states.

Walking along the once thriving bazaar in front of the Virupakshia temple, as women

Vijayanagara Empire

- **Established in**: 1336 by Harihara (Hakka) and his brother Bukka Raya in the Deccan region of southern India.
- **Capital City:** The empire was named after its capital, Vijayanagara, which is now a UNESCO World Heritage site in modern Karnataka, India.
- **Geographical Extent:** The empire extended from the Krishna River in the north to the southernmost tip of the Indian peninsula.

Context: Concerns about the preservation of Hampi, one of India's largest World Heritage Sites, emerged after a temple pavilion collapsed in the rains, sparking debates on its alleged neglect.

Hampi Site

- **About:**
- **Established in**: 1336 by brothers Harihara-I and Bukka Raya-I of the Sangama dynasty.
- **Located in:** Tungabhadra basin in Bellary District, Central Karnataka.
- **Capital of:** Vijayanagar Empire
- **Architectural Features**: Hampi's temples are renowned for their large dimensions, ornate decoration, and detailed carvings, with many depicting scenes from the Ramayana and Mahabharata.
  - **Vittal Temple Complex:** It constructed by Krishnadeva Raya (A.D. 1509-30), is a prime example of Vijayanagar Temple Architecture, showcasing intricate designs and carvings.
- **Royal Patronage**: A significant number of royal structures in Hampi were built under the patronage of Krishnadeva Raya, reflecting the empire's prosperity and architectural prowess.
- **UNESCO World Heritage Site**: In 1986, Hampi was recognized as a UNESCO World Heritage site for its cultural and historical significance.
- **World Heritage in Danger List:** in 1999, Hampi had a scare when UNESCO put the site on the Danger List.

TIMES OF INDIA

Aug 23

JOINT CONSULTATIVE MACHINERY (JCM)

(Syllabus: GS Paper 3 – Economy)

Delegation of central govt employees to raise assured pension with PM Modi

Context: Staff representatives of the Joint Consultative Machinery (JCM) will request the Prime Minister of India to ensure an assured pension of 50% of the last salary under the National Pension System during their upcoming meeting.

- This will be in addition to their demand for periodic inflation adjustment, a minimum payout for those who leave govt service before completing 20 years as well as protection for family pension.

Joint Consultative Machinery (JCM)

- **Introduction**: The scheme was introduced in 1966 to foster harmonious relations and cooperation between the Central Government (as the employer) and its employees.
- **Purpose**: JCM serves as a platform for constructive dialogue between government employees and the Central Government to resolve disputes peacefully.
- **Coverage**: It includes all regular civil employees of the Central Government.
- **Non-Statutory Agreement**: JCM is a non-statutory scheme, mutually agreed upon by the staff side and the official side.
- **Exclusions**: The scheme does not cover Class-I services, Class-II services (except the Central Secretariat Services and comparable services in government headquarters), and certain managerial, administrative, and supervisory personnel in industrial establishments.
- **Union Territories Exclusion**: Employees of Union Territories are not covered under the JCM scheme.
- **Police Personnel Exclusion**: Police personnel are also excluded from the scheme.

National Pension System

- **About**: NPS is a low-cost, easily accessible, and tax-efficient retirement savings account.
- **Flexible Contributions**: Individuals can contribute to their retirement account, with the option for employers to co-contribute for social security and welfare.
- **Defined Contribution Model**: NPS operates on a Defined Contribution basis, meaning the final pension amount depends on contributions and investment returns, not a pre-defined benefit.

BUSINESS STANDARD

Aug 23

BOTSWANA

(Syllabus: GS Paper 1 – Places in News)

Canadian firm discovers world's second-largest diamond in Botswana

Context: The world's second-largest 2,492-carat diamond has been discovered in Botswana at a mine owned by Lucara Diamond, a Canadian firm.

Botswana:

- **About**: It is a landlocked country in Southern Africa. Botswana is topographically flat, with approximately 70 per cent of its territory being the Kalahari Desert.
- **Capital**: Gaborone.
- **Border countries**: It is bordered by South Africa to the south and southeast, Namibia to the west and north, Zambia to the north and Zimbabwe to the northeast.

Diamond Industry:

- **Top Natural Diamond Producers:** Russia, Botswana, Canada, Australia, South Africa, and Congo (Zaire).
- **Other Important Producers**: Namibia, Ivory Coast, Sierra Leone, Venezuela, Brazil, and more.
- **World's Largest Diamond**: 3,106-carat – was found in South Africa in 1905, also known as the Cullinan Diamond.
- **Diamond in India:**
  - India is the world's largest cutting and polishing centre for diamonds.
  - It accounts for over 90% of polished diamond manufacturing globally.
  - **Distribution:**
    - ✓ Panna belt in Madhya Pradesh;
    - ✓ Wajrakarur Kimberlite pipe in Anantapur district and
    - ✓ Gravels of the Krishna river basin in Andhra Pradesh.
  - **Reserve Estimates**: Reserves have been estimated mainly in the Panna belt and Krishna Gravels in Andhra Pradesh, with recent discoveries of kimberlite fields in Karnataka's Raichur-Gulbarga districts.

FINANCIAL EXPRESS

Page 3

RIGHT TO EDUCATION ACT, 2009

(Syllabus: GS Paper 2 –Education)

High Court orders merger of school IDs in bid to 'serve larger goal of RTE Act'

SOHINI GHOSH
NEW DELHI, AUGUST 23

"THERE ARE no poor or rich dreams nor are there poor or rich talents," said the Delhi High Court on Friday as it ordered the merger of identification numbers (or IDs) of different wings of the same schools to ensure a seamless transition and dignity of students of economically weaker section and disadvantaged group (EWS/DG). Stressing that the order aims to "serve and achieve the larger goal of the Right to Education (RTE) Act", the High Court also issued a slew of guidelines to be followed for admission under the Act. The appointment of nodal officers at all the schools to oversee the admissions is included in the guidelines.

The verdict by the court of Justice Swarana Kanta Sharma came over a bunch of petitions by parents of several minor children who were admitted to the junior wing of Holy Innocents Public School under the EWS/DG category. They were subsequently denied admission to the senior wing of the same school despite being promoted to class 1 because of different IDs of the two wings assigned to them by the Department of Education (DoE). The different IDs were issued on account of the two wings being located separately — one in Janakpuri and another in Vikaspuri — even as the two wings are run by the same trust. The DoE has now agreed to merge the two IDs.

Observing that this is a recurrent issue faced by EWS/DG students in the city, the High Court directed that the different identification numbers, assigned to the junior and senior wings of the same schools that are run by the same educational societies in Delhi, "be merged into a single ID by the DoE." The court said that the process of merging be completed within eight weeks of the passing of the judgment and a compliance report be filed by the DoE after eight weeks. "In this court's opinion," the HC said, "seamless transition from one class to another is important in ensuring that the dignity of the children and their parents is not compromised."

Context: The Delhi High Court has ordered the merger of school IDs to better serve the objectives of the RTE Act and directed all private unaided recognized schools in Delhi to appoint a dedicated nodal officer to oversee the admission process for EWS/DG category students.

Right to Education Act, 2009

- **Origin:** It is an Act of the Parliament of India enacted on 4 August 2009.
- **Objective**: To provide primary education to all children aged 6 to 14 years in India under Article 21A of the Indian Constitution.
- **Features:**
  - **Creating inclusive spaces for all**: 25% reservation for disadvantaged groups which include SCs and STs, Socially Backward Class and differently abled. Five States namely Goa, Manipur, Mizoram, Sikkim and Telangana have not issued notification regarding 25% seats for underprivileged children of society under the RTE.
  - **Compulsory and free education for all**: It is obligatory for the Government to provide free and compulsory elementary education to each and every child, in a neighbourhood school within 1 km, up to class 8 in India.
  - **No Detention Policy**: It was introduced as a part of the Continuous and Comprehensive Evaluation (CCE) under the RTE in 2010.
  - **The EWS criteria under RTE**: It is Rs 1 lakh annual income, while for those seeking reservation in higher educational institutes and government jobs, it is Rs 8 lakh per annum.
  - The RTE Act section 2 (E) empowers state to determine the income limit for EWS category for the purpose of 25% admissions in the private schools.
  - **As per Section 12(1)(c) of RTE Act, 2009**: All Private Unaided Recognized Schools (except Minority Schools) are under obligation to admit at least 25% of strength at the entry level (Pre-School/Nursery, Pre-primary/KG &Primary/Class-1) class(es) by children belonging to Economically Weaker Section, Disadvantaged group.

Constitutional Provisions

- **Article 21**: Unnikrishnan JP vs State of Andhra Pradesh & Others (1993): SC held that Education is a Fundamental right under Article 21.
- **Article 21A:** 86th Constitutional Amendment (2002): It inserted Article 21A which made Right to Education a fundamental right for children between 6-14 years.
- **Article 45**: It states that the state should provide free and compulsory education to children up to the age of 14.

TIMES NOW Aug 23

URANUS
(Syllabus: GS Paper 1 – Geography)

Carbon Dioxide Ice Found On Uranus' Moon Ariel, Hinting At Possible Underground Ocean

Context: Scientists using NASA's James Webb Space Telescope have made a significant discovery in their quest for water across the solar system by detecting carbon dioxide ice on the surface of Ariel, one of Uranus's 27 moons.

Uranus

- **About**: It is the seventh planet from the Sun, and the third largest planet in our solar system. It appears to spin sideways.
- **Position and Size**: Equatorial diameter of 31,763 miles (51,118 kilometers), about four times wider than Earth.
- **Unique Tilt:** The planet rotates at a nearly 90-degree angle relative to its orbit, making it appear to spin on its side.
- **Color**: Uranus has a blue-green hue due to the presence of methane in its atmosphere, which absorbs red light and reflects blue light.
- **Distance from the Sun**: Located approximately 1.8 billion miles (2.9 billion kilometers) from the Sun, or about 19 astronomical units (AU). Sunlight takes about 2 hours and 40 minutes to reach Uranus.
- **Day and Year Length**: One day on Uranus lasts about 17 Earth hours, while a year (one complete orbit around the Sun) takes roughly 84 Earth years (30,687 Earth days).
- **Moons**: The planet is orbited by 28 known moons, which vary in size and composition.
- **Rings:** Uranus possesses two sets of rings: an inner system of nine narrow, dark grey rings and two outer rings, with the innermost being reddish and the outermost having a blue hue similar to Saturn's E ring.
- **Temperature and Atmosphere**: Uranus is characterized by its extremely cold temperatures and strong winds, contributing to its harsh and inhospitable conditions.

Key Points of Discovery

- **Surface Discovery**: Carbon dioxide ice has been detected on Ariel, one of Uranus' moons.
- **Liquid Ocean Hypothesis**: The presence of carbon dioxide ice hints at a possible liquid ocean beneath Ariel's surface.
- **Carbon Dioxide Release**: The underground ocean might be releasing carbon dioxide through chemical reactions, which escapes to the surface via ice cracks.
- **Field-Driven Chemistry:** Uranus' magnetic field may be breaking down molecules to produce carbon dioxide on Ariel.

THE HINDU Page 8

SC & ST ACT, 1989

(Syllabus: GS Paper 2 – Polity & Governance)

'Not all insults can be ruled as offences under SC/ST law'

Krishnadas Rajagopal
NEW DELHI

The Supreme Court held in a judgment on Friday that not all insults and intimidatory comments aimed at a Scheduled Caste or Scheduled Tribe person would be an offence under the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989.

A Bench of Justices P.B. Pardiwala and Manoj Misra interpreted the special law of 1989 while allowing anticipatory bail to Shajan Skaria, the editor and publisher of the YouTube channel *Marunadan Malayali*, in a case registered against him under the 1989 Act for allegedly uploading a derogatory video against Kerala MLA P.V. Sreenijin, a Scheduled Caste community member.

Justice Pardiwala said the aggressor, who is not a Scheduled Caste/Scheduled Tribe (SC/ST) person, cannot be booked under the 1989 Act merely because the victim of his insults or intimidatory act happened to be an SC/ST person.

On the other hand, the Act would come into play if the insult had been intentionally thrown at the victim only on account that the latter was an SC/ST member.

In fact, the court held that the very reason behind the intentional insult or intimidation should solely be the identity of the victim as a member of the SC/ST community.

"There is nothing in the transcript of the uploaded video to indicate even *prime facie* that those allegations were made by the appellant (Skaria) only on account of the fact that the complainant (Srinijin) belongs to a Scheduled Caste... Is it the case of the complainant that had he not belonged to a Scheduled Caste, the appellant would not have levelled the allegations? The answer lies in the question itself," Justice Pardiwala reasoned.

To effectively invoke this provision, the "humiliation" inflicted by the aggressor should be "intricately associated with the caste identity of the victim", the judgment noted.

Context: The Supreme Court held in a judgment that not all insults and intimidatory comments aimed at a Scheduled Caste or Scheduled Tribe person would be an offence under the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989.

SC & ST (Prevention of Atrocities) Act, 1989

- **Enactment:** The government enacted the Act in 1989.
- **Aim:** Furtherance of the provisions for abolition of untouchability (Article 17) and equality (Articles 14, 15) in the Constitution.
- **Offender:** Any person who is not a member of a scheduled caste or a scheduled tribe and **commits an offence listed in the Act** (Ex: - Forcing to eat/ drink any inedible or obnoxious substance, intent to cause injury, insult, or annoyance etc.) against a member of a scheduled caste or a scheduled tribe is an offender.
- **Anticipatory Bail:** Under section 18 of the act, provision for anticipatory bail is not available to the offenders.
- **Punishments:** The police can arrest the offender without a warrant and start an investigation into the case without taking any orders from the court.
    - The accused can be punished between six months to five years sentence and with a fine to life imprisonment or even death sentence in some cases.

Supreme Court Ruling on SC/ST Act

- **Intentionality Matters**: The SC/ST Act applies only if the insult or intimidation is intentional and directly related to the victim's identity as a member of the SC/ST community.
- **Aggressor's Identity**: A non-SC/ST person cannot be booked under the Act merely because the victim is from an SC/ST community unless the aggression was specifically due to their caste identity.
- **Caste-Based Humiliation**: Not every insult towards an SC/ST member qualifies under the Act; it must cause a feeling of caste-based humiliation rooted in untouchability or caste superiority.
- **Historical Context**: The insult must reinforce ideas like caste purity, pollution, or the superiority of 'upper castes' over 'lower castes' to fall under the Act.
- **Focus on Discrimination**: The Act specifically targets insults and intimidation that perpetuate historical discrimination or untouchability practices.
- **Clarification by the Court:** The court emphasized that the insult must be solely due to the victim's SC/ST identity for the Act to apply.

RAIL FORCE ONE

(Syllabus: GS Paper 2 – IR)

What is 'Rail Force One', the train PM Modi took from Poland to Ukraine?

RISHIKA SINGH
NEW DELHI, AUGUST 23

PRIME MINISTER Narendra Modi arrived in Ukraine's capital Kyiv from neighbouring Poland by train on Friday, an unusual mode of transport for a head of government, but one that has been used earlier by other global leaders as well.

Foreign dignitaries visiting Kyiv have been taking the train ever since Ukraine's airspace was closed following the Russian invasion of February 2022. After Joe Biden rolled into Kyiv last year instead of flying in on Air Force One, the US President's iconic Boeing 747 aircraft, the train was dubbed "Rail Force One".

Prime Minister Narendra Modi at the Kyiv Central Railway Station on Friday. *ANI*

The train to Kyiv

The train, which is run by the state-owned Ukrainian Railways or Ukrzaliznytsia, is painted blue and yellow, the colours of Ukraine's flag.

The train has several luxury compartments, one of which was likely built just before Russia annexed Crimea in 2014, and was previously used to ferry wealthy tourists to the peninsula on the Black Sea, according to a report by the US government-funded *Radio Free Europe*.

Pictures from trips taken by foreign dignitaries show wooden panels, cream and blue curtains, leather sofas, king-size beds, wall-mounted flatscreen TVs and other modern amenities on the train.

The train's 10-hour, 700-odd-km journey begins at Przemysl Główny station in Poland, located around 400 km southeast of Warsaw, close to the country's border with Ukraine, and ends at Kyiv.

Famous passengers

The first foreign dignitaries to travel to Kyiv by the train were the prime ministers of Poland, Slovenia, and the Czech Republic, who visited in 2022.

Thereafter, the train was used by the former British Prime Minister Boris Johnson, French President Emmanuel Macron, President of the European Commission Ursula von der Leyen, and Prime Minister Justin Trudeau of Canada, besides Biden and now Modi.

Kyiv's 'iron diplomacy'

Alexander Kamyshin, Ukraine's Strategic Industries Minister who is in charge of Ukrzaliznytsia, has often used the hashtag #IronDiplomacy to refer to the world leaders' train trips.

In 2023, Kamyshin posted on X about President Biden's 20 hours on the train and just four in Kyiv, and apologised to the public when Biden's travel led to some other trains on the network being delayed.

"We had to delay some of our trains to give a way to #RailForceOne. It was painful for me and my team, but I had to do that. So only 90% of our trains arrived on time yesterday. I apologize," he wrote.

Crucial for Ukraine

This train, and other trains in the Ukrainian railway network, have played an important role in the war effort, including helping transport aid across the country, and Kamyshin has spoken repeatedly about the importance of the railways to his country.

As the war broke out, many Ukrainians rushed to train stations in an attempt to escape to safer places, or to leave the country.

Ukraine's widespread railway network has always been popular, and domestic travellers often favour trains over planes. Ukrzaliznytsia is the sixth-largest railway passenger transporter in the world, and seventh for freight, according to a *CNN* report.

Context: The Prime Minister of India's visit to Ukraine is historic, being the first by an Indian leader since Ukraine's independence from the Soviet Union in 1991. His journey aboard the high-security "Rail Force One" highlights the unique logistical and security challenges in the war-torn region.

Rail Force One

- **About:** This train is known for its luxurious and secure accommodations, featuring wood-panelled cabins, long tables for meetings, plush sofas, and wall-mounted TVs.
    - The train, which is run by the state-owned Ukrainian Railways or Ukrzaliznytsia, is painted blue and yellow, the colours of Ukraine's flag.
- **Initial Purpose**: Originally built in 2014 to accommodate tourists visiting Crimea, the train's role was shifted following the annexation of Crimea by Russia.
- **Famous passengers**: The first foreign dignitaries to travel to Kyiv by the train were the prime ministers of Poland, Slovenia, and the Czech Republic, who visited in 2022.
- **Secure Transportation**: It provides secure transportation for world leaders and VIPs, addressing security concerns due to the ongoing military conflict in Ukraine.
- **Repurposed for Safety**: Post-annexation, the train was repurposed to ensure the safe transport of high-profile individuals through conflict-affected areas of Ukraine.
- **Significance in War Effort**: The 'Rail Force One' train, along with other trains in Ukraine's railway network, plays a vital role in the war effort by transporting aid and supporting logistics.
- **Enhanced Railway Importance**: Ukrainian officials, including Kamyshin, have emphasized the critical role of the railways in maintaining national operations and responding to wartime challenges.
- **Symbol of Resilience:** The 'Rail Force One' stands as a symbol of resilience and adaptability, showcasing Ukraine's ability to maintain high standards of security and luxury even amid ongoing conflict.

ECONOMIC TIMES Aug 22

TERAHERTZ BAND

(Syllabus: GS Paper 3 – Sci and Tech)

TRAI proposes new terahertz spectrum for research and trials, includes assignment-exempt bands

Context: TRAI recommended establishing a Terahertz Experimental Authorisation (THEA) for research and development in the 95 GHz – 3 THz frequency bands.

Terahertz Band

- **About**: It waves fall between the microwave and infrared regions in the electromagnetic spectrum.
- THz technology is employed to investigate molecular motion and interactions, providing insights into various planetary and terrestrial phenomena.
- **Terahertz Properties:**
  - Between microwaves & infrared
  - Frequency range 100 GHz .. 10 THz, wavelengths 3 mm .. 30 µm
  - Also known as far-infrared or sub-millimeter waves
  - Non-ionizing, but penetrates clothing, paper, cardboard, plastics, …
  - Absorbed by water and many organic substances
  - High chemical sensitivity
- **Applications:**
  - THz technology shows promise for biomedical uses, offering potential for new diagnostic and therapeutic tools in medicine.
  - THz technology is used in molecular line spectroscopy for studying molecular motion and interactions, particularly in astrophysics and planetary science.
  - THz waves help analyze quantum effects and molecular behavior in celestial bodies.
  - THz waves are applied to understand geological and planetary processes by studying molecular dynamics.
- **Impact:** THz radiation has been observed to affect the nervous system, including changes in nerve cell membrane structures, gene expression, and cytokine levels.

DTE Aug 23

MERCURY IN ARCTIC'S PERMOFROST

(Syllabus: GS Paper 3 – Env and Eco)

Toxic mercury trapped in Arctic's permafrost is now leaking into environment due to global warming: Study

Context: A recent study warns that the thawing of Arctic permafrost due to climate change is releasing vast amounts of toxic mercury into the environment, posing severe health risks to global flora and fauna.

Permafrost

- **Definition:** It refers to ground that stays consistently frozen—reaching temperatures of 32°F (0°C) or below—for a minimum of two consecutive years. Such permanently frozen areas are prevalent in locations with elevated mountains and in the higher latitudes of the Earth, particularly near the North and South Poles.
- **Geographical Distribution**: Arctic regions of Siberia, Canada, Greenland, and Alaska—where nearly 85 percent of the state sits atop a layer of permafrost.
    - Also found on the Tibetan plateau, in high-altitude regions like the Rocky Mountains.
- **Composition**: Permafrost comprises a blend of soil, rocks, and sand that are bound together by ice. Throughout the entire year, both the soil and ice within permafrost remain in a frozen state.
- **Organic Carbon:** Near the surface, permafrost soils house substantial amounts of organic carbon, a residue from deceased plants that failed to decompose due to the persistent cold. Deeper permafrost layers, in contrast, predominantly consist of mineral-rich soils.

Arctic Mercury Contamination

- **Global Contaminant**: Mercury, a significant global environmental contaminant, originates from both natural sources and human activities.
    - Mercury is a neurotoxin that can severely damage the brain and nervous system, particularly through bioaccumulation in the food chain.
- **High Mercury Concentrations:** The amount of mercury stored in Arctic permafrost surpasses the total mercury present in all other earth systems combined, including oceans, soils, atmosphere, and biosphere.
- **Transport to the Arctic:** The majority of mercury in the Arctic is transported from outside the region through long-range air and ocean pathways, with over 98% of atmospheric mercury being emitted elsewhere.
- **Impact on Arctic Populations**: Arctic residents, including indigenous communities, are among the most exposed populations globally, facing heightened health risks due to mercury contamination.
- **Permafrost Accumulation**: Mercury absorbed by plants in the Arctic eventually becomes part of the soil and freezes into permafrost, accumulating over thousands of years.
- **Climate Change Effects**: The thawing of permafrost, accelerated by climate change, releases stored mercury, posing increased risks as this 'giant mercury bomb' becomes more likely to impact the environment

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