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C. RAJAGOPALACHARI

Lok Sabha Speaker Shri Om Birla paid floral tributes to Bharat Ratna Shri Chakravarti Rajagopalachari in Central Hall of Samvidhan Sadan on his Birth Anniversary,



About C. Rajagopalachari:

- **Chakravarti Rajagopalachari**, popularly referred to as **Rajaji**, was born on 10 December 1878 in Thorapalli, **Tamil Nadu**.

Role in India's Independence Movement

- Rajaji's personal interaction with Gandhi in 1919 led him to give up his legal profession to be fully involved in the **nation's independence struggle**.
- He participated in agitations against the Rowlett Act, the Non-Cooperation movement, the Vaikom Satyagraha, and the Civil Disobedience Movement.
- For these activities, between 1912 and 1941, as a result of which he was jailed five times.
- Rajaji was elected to the **Constituent Assembly from Madras** on a Congress party ticket. In the Assembly, he intervened on the issues of religious freedom and citizenship.
- In 1954 he was **conferred with the Bharat Ratna** for his contribution to Indian politics and literature.

Key Writings

- Rajaji was a prolific writer. His most popular works include a retelling of the **Mahabharata and Ramayana in English**, and **Ramayana – Chakravarti Thirumagan** in Tamil.

HYPERLOOP TRACK

Recently, IIT Madras has completed a 410-meter Hyperloop test track, marking a significant milestone in India's journey toward futuristic transport systems.





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About Hyperloop Track:

- Hyperloop is a **high-speed transportation system** in which pods, functioning as pressurised vehicles, travel at incredible speeds through low-pressure tubes.
 - The Hyperloop concept was originally popularised by Elon Musk in 2012.
 - **Working:** These trains operate within **vacuum-sealed tubes**, significantly reducing friction and allowing for unparalleled travel speed and energy efficiency.
 - Hyperloop pods are designed to reach speeds of **up to 1,100 kmph**, with an operational cruising speed of **around 360 kmph**.
 - **Key components include:**
 - **Low-Pressure Tubes:** Sealed to minimise air resistance.
 - **Magnetic Levitation (Maglev):** Pods "float" on magnets, eliminating friction.
 - **Linear Electric Motors:** Propels the pod smoothly and efficiently.
 - These features combine to deliver unparalleled speed and efficiency, with zero direct emissions—making Hyperloop the ultimate in green transit.
 - India's hyperloop project is a joint initiative of **Indian Railways, IIT-Madras' Avishkar Hyperloop team and TuTr (incubated startup)**.
 - **Significance to India:** This innovative system is seen as a promising solution for addressing the growing demands for efficient and sustainable transportation.
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WHAT IS WILLOW CHIP?

Recently, Google has announced a significant advancement in quantum computing as it unveiled its next-generation chip called 'Willow'.



by Google.

About Willow Chip:

- It is a new state-of-the-art **quantum computing chip** developed

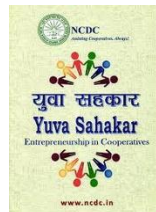
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- The components of the chip include **single and two-qubit gates, qubit reset, and readout** that have been engineered and integrated to ensure that there is no lag between any two components as that may adversely impact system performance.
- It was able to **solve a complex mathematical problem** in just five minutes — a task that would take classical computers longer than the history of the universe.
- It performed a standard benchmark computation in under five minutes that would take one of today's fastest supercomputers 10 septillion (that is, 10²⁵) years.
- It **operates using superconducting transmon qubits**—tiny electrical circuits exhibiting quantum behaviour at extremely low temperatures. These circuits are engineered to function like artificial atoms in a quantum state.

What is a quantum chip?

- A quantum chip is a special type of computer chip designed to use the principles of quantum mechanics, the science of very tiny particles like atoms.
- -While regular chips use 'bits' (0 or 1) to process information, quantum chips use '**qubits**', **which can be 0 or 1** or both at the same time.
- This unique ability allows quantum chips to handle complex calculations much faster than traditional computers.

YUVA SAHAKAR SCHEME



Recently, the Minister of Cooperation informed the Lok Sabha about Yuva Sahakar Scheme.

- Yuva Sahakar – Cooperative Enterprise Support and Innovation Scheme” aims to **encourage newly formed cooperative societies** with new and/or innovative ideas.
- The scheme encourages young entrepreneur Cooperative Societies which are in operation for a **minimum of 3 months**.



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- The loan provided under the scheme is a long-term loan (up to 5 years) and as an incentive, NCDC **provides 2% interest subvention** on its applicable rate of interest on term loan for the project activities.
- Further, the loan component under the scheme can also be dovetailed with subsidy, as applicable and available from other Government of India schemes. NCDC funding is project based.
- It is being implemented by **National Cooperative Development Corporation (NCDC)** across the country.
- **Features**
 - NCDC has produced a dedicated fund with liberal traits entitling youth to avail the scheme.
 - It is **linked with Rs.1000 crores** of the Cooperative Start-up and Innovation Fund that has been authorised by the NCDC.
 - It provides more incentives to the cooperatives working in the North-Eastern region and the aspirational districts.
 - Exclusive benefits are provided for women, Scheduled Caste and Scheduled Tribe candidates.
 - Yuva Sahakar Scheme is a part of Sahakar 22, a Mission for Doubling Farmers' Income by 2022.

[RAILWAYS \(AMENDMENT\) BILL, 2024](#)

The Railways (Amendment) Bill, 2024, was passed recently in the Lok Sabha, despite disruptions.



About Railways (Amendment) Bill, 2024:

- All the provisions in the erstwhile colonial-era Indian Railway Board Act, 1905, are proposed to be

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incorporated in the Railways Act, 1989, through this Bill.

- It is intended to simplify the legal framework and **reduce the need to refer to two laws.**
- The Bill also proposes to **amend the Railways Act, 1989**, to provide statutory backing to the **Railway Board**, which has functioned without such a sanction since it began functioning.
- The statutory powers seek to **enhance the functioning and independence** of the Railway Board.
- It also **authorises the Union government to decide the composition** of the Railway Board.
- This **includes the number of members, their terms of service, and their qualifications and experience.**
- **Independent regulator:** The bill proposes to **establish an independent regulator to oversee tariffs, safety, and the participation of the private sector** in the Railways.
- The bill **also proposes to improve operational efficiencies and decentralize powers, granting greater autonomy to railway zones.**
- The amendment is **expected to speed up the approval process for train services** that will help meet pending demands from various regions.
- The bill will **allow the government to fast-track infrastructure and superfast train operations.**

WORLD MALARIA REPORT 2024

Malaria cases in India dropped 69%, from 6.4 million in 2017 to 2 million in 2023. Deaths fell by 68%, from 11,100 to 3,500, according to the World Malaria Report 2024.



About World Malaria Report 2024:

- It is an annual report released by the **World Health Organisation (WHO).**
- It serves as a vital tool to assess global progress and gaps in the fight against malaria.



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- **Highlights of the 2024 Report:**
 - Globally, the report noted an estimated **263 million malaria cases** and **597,000 deaths in 2023**, representing an **increase of 11 million cases** compared to 2022, with deaths remaining nearly the same.
 - **Africa** continues to bear the brunt of the disease, accounting for **94 percent of global cases** and **95 percent of malaria deaths in 2023**, with **children under 5** accounting for **76% of mortality**.
 - Four countries — **Nigeria, the Democratic Republic of the Congo, Niger and Tanzania** — contributed over **half of the region's deaths**.
 - **In India**, the report highlighted that the **country officially exited the High Burden to High Impact (HBHI) group in 2024** due to significant reductions in malaria incidence and mortality in high-endemic states.
 - The number of estimated **malaria cases in India decreased from 6.4 million in 2017 to 2 million in 2023**, marking a 69% drop.
 - Similarly, **malaria deaths fell from 11,100 to 3,500 over the same period, a 68% reduction**.
 - Despite these advances, **India accounted for half of all malaria cases in the WHO South-East Asia Region in 2023**, which saw a reduction of 82.4% in cases, from 22.8 million in 2000 to 4 million in 2023.
 - **The region**, home to a quarter of the world's population, represented **5% of global malaria cases in 2023**.
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GENE THERAPY SUCCESS IN INDIA

Why in News?

Indian scientists have achieved a major milestone by using gene therapy to **treat severe Hemophilia A**, a rare genetic condition causing life-threatening bleeding episodes. This pioneering work, tested on five patients in Tamil Nadu, has shown promising results, with no bleeding episodes reported over an average follow-up period of 14 months.

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What is Gene Therapy?

- Human gene therapy seeks to **modify or manipulate the expression of a gene or to alter the biological properties of living cells** for therapeutic use.
- It is used to **treat or cure disease including cancer, genetic diseases, and infectious diseases.**
- Gene therapies can work by several mechanisms:
 - Replacing a disease-causing gene with a healthy copy of the gene.
 - Inactivating a disease-causing gene that is not functioning properly.
 - Introducing a new or modified gene into the body to help treat a disease.
- **There are a variety of types of gene therapy products**, including:
 - **Plasmid DNA:** Circular DNA molecules can be genetically engineered to carry therapeutic genes into human cells.
 - **Viral vectors:** Once viruses have been modified to remove their ability to cause infectious disease, these modified viruses can be used as vectors (vehicles) to carry therapeutic genes into human cells.
 - **Bacterial vectors:** Bacteria can be modified to prevent them from causing infectious disease and then used as vectors (vehicles) to carry therapeutic genes into human tissues.
 - **Human gene editing technology:** The goals of gene editing are to disrupt harmful genes or to repair mutated genes.
 - **Patient-derived cellular gene therapy products:** Cells are removed from the patient, genetically modified (often using a viral vector) and then returned to the patient.

Understanding Hemophilia A:

- **What is Hemophilia?**
 - It is a rare, inherited blood disorder that prevents blood from clotting properly.
 - It **can be classified** as minor or severe depending on the percentage of clotting factors present in those afflicted.

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- **What is Hemophilia A?**
 - **Meaning:** It is a rare hereditary disorder caused by the absence of Factor VIII, a critical blood-clotting protein.
 - **Severity:** Classified as minor or severe based on clotting factor levels; severe cases have less than 1% clotting factor.
 - **Global context:** India has the world's second-largest patient pool, estimated at 40,000-100,000.
- **Current treatments:**
 - **Frequent interventions:** Repeated Factor VIII infusions, monoclonal antibodies, or mimicking substances are used.
 - **High costs:** Treatment costs in India are approximately ₹2.54 crore per patient over 10 years, making it inaccessible for many.

The Promise of Gene Therapy:

- **How does it work?**
 - **One-time solution:** Gene therapy introduces a functional gene that enables the body to produce sufficient Factor VIII, reducing or eliminating the need for repeated infusions.
 - **Innovative technique used:** The Indian trial fused stem cells with the clotting factor gene using **lentivirus** (a safer vector compared to adenovirus), which eliminates the need for immunosuppressive drugs.
- **Results from the trial:**
 - **Patients:** Five individuals treated, with no bleeding episodes over 14 months.
 - **Research team:** Led by Alok Srivastava from the Christian Medical College (CMC), Vellore.
 - **Support:** Funded by the Union Department of Biotechnology.

Global Context of Gene Therapy:

- **Roctavian:** Approved by the U.S. FDA in 2023, reducing bleeding incidents significantly in patients.



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- **Mechanism:** Uses adenovirus vectors to deliver the therapeutic gene, requiring immune suppression.

Significance of the Gene Therapy Success in India:

- Experts called the study “**ground-breaking**” due to:
 - **Resource constraints:** Demonstrating the feasibility of conducting advanced gene therapy in a developing country.
 - **Cost reduction:** Potential for localising gene therapy manufacturing in India, improving accessibility.
 - **Broader access:** Overcoming barriers like immunosuppressive therapy and age limitations. This method may allow **younger patients** to receive treatment, overcoming challenges like liver maturity and health.

Conclusion:

- The success of this gene therapy trial in India represents a **transformative step** in treating Hemophilia A, offering a **safer, more accessible, and effective solution**.
 - This breakthrough not only holds promise for India but also sets a global precedent for advancing medical care in resource-constrained settings.
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