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MINISTRY OF SCIENCE AND TECHNOLOGY



MK Yadav Sir

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ARTICLE 370

(Syllabus: GS Paper 2 – Polity)

Citizens have right to criticise revocation of Article 370, says SC

Krishnadas Rajagopal
NEW DELHI

The Supreme Court on Thursday quashed an FIR accusing a college professor in Maharashtra of spreading enmity and disharmony by terming the day of revocation of special status of Jammu and Kashmir under Article 370 a "black day" and wishing "happy independence" to the people of Pakistan on a WhatsApp group of faculty and parents.

"Describing the day the abrogation happened as a 'Black Day' is an expression of protest and anguish. The right to dissent in a lawful manner must be treated as a part of the right to lead a dignified and meaningful life guaranteed by Article 21," Justice A.S. Oka, heading a Division Bench, observed in the judgment.

Justice Oka said a "simple protest" registered by Professor Javed Ahmed Hajam against the decision to revoke Article 370 cannot be used by the police to lodge a case under Section 153A (promoting enmity among different classes of people) of the Indian Penal Code.

To invoke Section 153A, he said, there should have been an intention to promote feelings of enmity or hatred among different classes of people. The provision should not be used to silence dissent, it noted.

"The Constitution guarantees freedom of speech and expression. Every citizen has the right to offer criticism of the action of abrogation of Article 370 or, for that matter, every decision of the state. He has the right to say he is unhappy with any decision of the state," he asserted.

Context: Recently, the Supreme Court nullified an FIR in Maharashtra against a college professor who referred to the abrogation of Article 370 as a "black day" and extended "happy independence" wishes to Pakistan on a WhatsApp group comprising faculty and parents.

Article 370 and its Removal

- **Background**: The Constituent Assembly of Jammu & Kashmir (through Article 370) was empowered to recommend which articles of the Indian Constitution should apply to the state.
    - **Clause 3 of the article 370 gives** the **President of India the power** to amend its provisions and scope.
- **Removal of Article 370**: Amendments were made to make applicable the entirety of India's Constitution to Jammu and Kashmir (J&K).
    - **It was done when the State was under President's Rule** with no elected Legislative Assembly in place.
    - In 2019, the Constitution (Application to Jammu and Kashmir) Order 2019, issued by the President, withdrew the special status of J&K and extended all provisions of the Indian Constitution to J&K.
- The **J&K (Reorganisation) Act 2019 bifurcated J&K into two UTs** - J&K was an UT with a Legislative Assembly; Ladakh was without an Assembly.

Section 153A

- **Historical Perspective**: The provision, penalizing the promotion of enmity between different groups based on various grounds, was introduced in 1898 and was not part of the original Indian Penal Code.
- **Evolution of the Law**: During the amendment, the concept of promoting class hatred, originally part of English law of sedition, was incorporated into Section 153A, addressing issues of religion, race, place of birth, residence, language, etc.
- **Rangila Rasool Case**: The Punjab High Court's acquittal in the Rangila Rasool case, where a Hindu publisher faced charges under Section 153A for disparaging remarks about the Prophet, highlights the early application of this legal provision.

INDIAN EXPRESS Explained

PRITZKER ARCHITECTURE PRIZE
(Syllabus GS Paper 1 – ART & Culture)

The work of Pritzker laureate Yamamoto: a mission to defeat isolation

SHINY VARGHESE
NEW DELHI, MARCH 7

JAPANESE ARCHITECT Riken Yamamoto was this week declared winner of the 2024 Pritzker Architecture Prize, the highest international award in the field, which is sometimes referred to as the "Architecture Nobel". The prize has been awarded every year since its founding in 1979, and Yamamoto is the ninth laureate from Japan.

EXPLAINED ARCHITECTURE

The Nobel of Architecture

The Pritzker Architecture Prize was instituted by Jay A Pritzker, the late founder of the Hyatt Hotels chain, and his wife Cindy, "to honour a living architect whose built work demonstrates talent, vision and commitment, who has produced consistent and significant contributions to humanity and the built environment through the art of architecture".

The award comes with a purse of $100,000, a citation, and a bronze medallion based on designs by Louis Sullivan, the Chicago architect known as the father of the skyscraper, which bears the words firmness, commodity, and delight, recalling the Roman architect and engineer Marcus Vitruvius's prescription for a well-built structure.

The winner is picked from a field of more than 500 on average, nominated by experts including past laureates, academics, and professionals, by a jury who make visits to sites of the projects. The prize is awarded in May, at a ceremony that is modelled on the Nobel Prizes.

The Pritzker and Japan

Architects from Japan have won the largest number of Pritzkers, including the 2010 prize that was shared by Kazuyo Sejima and Ryue Nishizawa, followed by the United States (eight laureates, including a shared prize and two architects with dual nationality). The only Indian laureate is the late Balkrishna Doshi (2018).

Kenzo Tange was the first Japanese winner in 1987, and he was followed by Fumihiko Maki (1993), Tadao Ando (1995), Toyo Ito (2013), Shigeru Ban (2014), and Arata Isozaki (2019), besides Sejima, Nishizawa, and now Yamamoto. Together, they represent a sweeping architectural vision — if Tange was celebrated for "producing not only a great body of built work, but [for] also stimulating the quest for an architecture that can again elevate the human spirit", Isozaki was lauded for a "worldwide vision that was ahead of his time and facilitated a dialogue between East and West".





One of Riken Yamamoto's buildings is the Hiroshima Nishi Fire Station (2000), which has a transparent façade and glass walls and floors, which allow passersby to look inside.
Courtesy: Tom Welsh; Tomio Ohashi

In her book *Jutaku: Japanese Houses* (2015), the American architect Naomi Pollock wrote that Japan's high inheritance tax (almost 55% on property) and scarce land and tiny plots call for innovative use of space and material. Also, old houses have very little resale value, and Japan's environmental awareness leads to experiments with shape, size, and material.

Uniqueness of Yamamoto

The 79-year-old Beijing-born Yamamoto privileges family and community, the seen over the unseen, above all else in his projects. Over a five-decade career, he has built private residences, community housing, schools, university buildings, institutions and public spaces, and led numerous initiatives to encourage local talent and construction. He has shown a commitment to working in villages, with designs that have people at their centre.

The Hiroshima Nishi Fire Station (2000) has a transparent façade and glass walls and floors that allow passersby to look inside. Yamamoto's idea was to keep the fire house at the centre of the community, making it "a reciprocal commitment between civil servants and citizens". Firefighters training on ropes and ladders in the central atrium are visible from outside.

The principle of being visible is part of Yamamoto's prescription to remedy society's isolation malaise. At the Koyasu Elementary School (2018), spacious, open terraces not only make learning the arts — dance, music, painting — a sight to behold, but also encourage students to interact. In Hotakubo Housing (1991) for 110 families, Yamamoto created "relational living", with a plaza with trees at its centre, which could be accessed only through the homes. At the Yokosuka Museum of Art (2006), he left the natural landscape — which sits sunken between mountains and Tokyo Bay — almost untouched, such that views from the boat approaching the museum are only of hills.

In a statement, Yamamoto, who is often called the "Misfit" architect, said: "The current architectural approach emphasizes privacy, negating the necessity of societal relationships. However, we can still honour the freedom of each individual while living together in architectural space as a republic, fostering harmony across cultures and phases of life."

Context: Japanese architect Riken Yamamoto was recently declared the winner of the 2024 Pritzker Architecture Prize, often dubbed the "Architecture Nobel," the highest international honor in the field.

The Nobel of Architecture

- **About**: Instituted by Jay A Pritzker, founder of Hyatt Hotels chain, and his wife Cindy.
- **Aim**: To honor a living architect whose work embodies talent, vision, and commitment to humanity and the built environment.
- **Components of the Award**: Prize includes $100,000, a citation, and a bronze medallion based on designs by Louis Sullivan.
- **Medallion features Sullivan's principles**: firmness, commodity, and delight, echoing Vitruvius's ideals for well-built structures.
- **Selection Process and Nomination**: Nominees exceed 500 on average and are selected by experts, including past laureates, academics, and professionals.
    - Jury members conduct site visits to evaluate the projects.
- **Award Ceremony and Timing**: The prize is awarded annually in May.
    - The ceremony is modeled after the Nobel Prizes, honoring the recipient for their architectural achievements.

The Pritzker and Japan

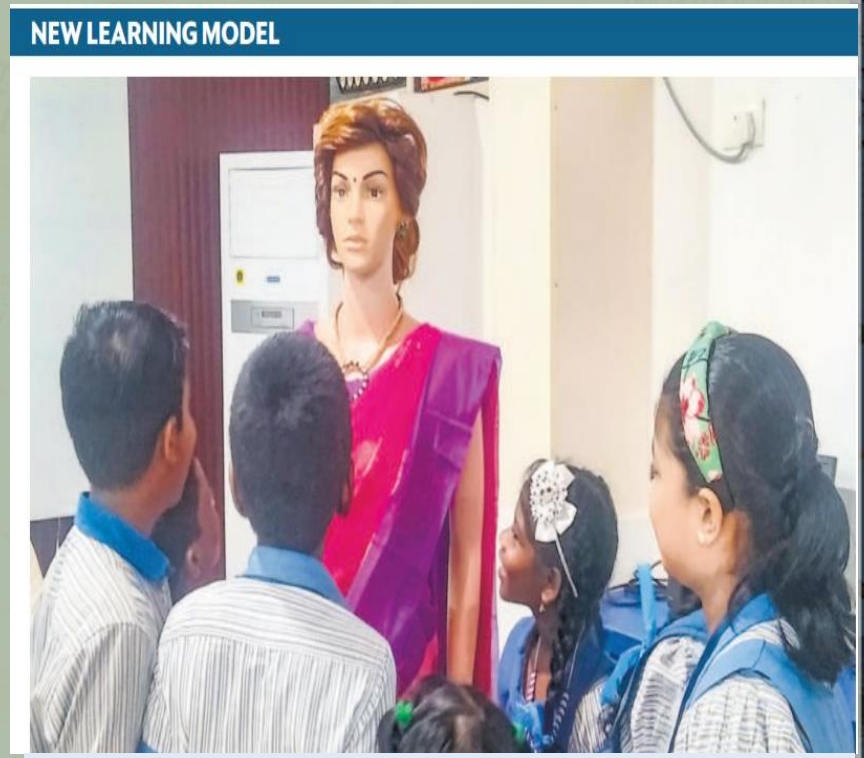
- **Japanese Dominance in Pritzker Prizes**: Architects from Japan have secured the highest number of Pritzker Prizes, reflecting their significant contributions to the field of architecture.
- **Indian Representation**: The late Balkrishna Doshi remains the sole Indian laureate of the Pritzker Prize, underscoring the need for greater recognition of architectural talent from India on the global stage.

IRIS AI ROBOT
(Syllabus: GS Paper 3 – Sci and Tech)

Dressed in saree, meet India's first-ever AI teacher robot named 'Iris'

Iris

- **About:** The robot is developed through a collaboration with Makerlabs Edutech, highlighting a synergy between technology and education.
- **Learning Experience for Students**: Its primary aim is to offer a personalized learning experience for students, catering to individual needs and learning styles.
- **Initiative under Atal Tinkering Lab (ATL) Project:** The development of Iris is part of the Atal Tinkering Lab (ATL) project initiated by NITI Aayog, signifying a government-led push for innovation in education.
- **Traditional Teaching Methods**: Iris boasts a range of features aimed at revolutionizing traditional teaching methods, aligning with the evolving needs of modern education.
- **Innovative Features and Technology**: Powered by an Intel chipset and equipped with an in-built voice assistant, Iris utilizes an Android app interface to deliver personalized learning experiences.
- **Multilingual and Problem-Solving Abilities**: Designed with wheels for mobility, Iris is capable of understanding and speaking different languages and addressing complex problems across various subjects.
- **Edutech's Vision:** Makerlabs Edutech proudly unveils Iris, demonstrating their commitment to innovation and inspiring confidence in future groundbreaking initiatives.



Context: Recently, **India's first AI teacher**, **'Iris',** has begun interacting with students at a school in Attingal, located in Thiruvananthapuram, Kerala.

DTE Mar 7

JAMES WEBB SPACE TELESCOPE
(Syllabus: GS Paper 3 – Sci and Tech)

James Webb Telescope spots oldest 'dead galaxy' that stopped forming stars 13 billion years ago: Study

Context: The **James Webb Space Telescope (JWST)** has captured the oldest-known dead galaxy, which stopped forming stars 13 billion years ago, according to a new study.

- The research team was surprised to find a so-called dead galaxy that essentially lived fast and died young so soon after the big bang that created the universe.

James Webb Space Telescope (JWST)

- **About:** The James Webb Space Telescope is the largest, most powerful space telescope ever built. **It** is named after **James E. Webb,** who was the administrator of NASA from 1961 to 1968 during the Mercury, Gemini, and Apollo programs.
- **Launched:** by NASA (National Aeronautics and Space Administration) on 25th December 2021 through the launch vehicle **Ariane 5 ECA.**
- **Collaboration**: It is a joint venture of NASA (US), ESA (Europe), and CSA (Canada).
- **Observing Early Galaxies**: The telescope will be able to capture images of some of the first galaxies ever formed.
- **Solar System Exploration**: It will also be able to observe objects in our solar system from Mars outward, look inside dust clouds to see where new stars and planets are forming and examine the atmospheres of planets orbiting other stars.
- **Sunshield Protection**: The Webb telescope's cameras are sensitive to heat from the Sun. Webb has a sunshield to protect its instruments and mirrors.
- **Infrared Vision**: The James Webb Space Telescope sees the universe in light that is invisible to human eyes. This light is called infrared radiation. The James Webb Space Telescope will use its infrared cameras to see through dust in the universe.
- **Powerful telescope:** It much more powerful than the presently deployed **Hubble space telescope.**
- **Function**: It will observe in near-infrared light rather than light in the visible part of the spectrum (unlike Hubble) and thus it will have a much greater capacity to see obscure stars and galaxies

INDIA TODAY Mar 7

CSPACE

(Syllabus: GS Paper 3 – S&T)

Kerala launches CSpace, India's first government-owned OTT platform

Context: Kerala recently launched CSpace, India's first government-owned OTT platform.

CSpace

- **About**: CSpace is managed by Kerala State Film Development Corporation (KSFDC), a state-owned company under the Department of Cultural Affairs, Kerala.
- **Addressing OTT Sector Challenges**: KSFDC Chairman, stated that CSpace addresses imbalances and challenges in the OTT sector's content selection and propagation.
- **Curator Panel Selection Process**: KSFDC has formed a curator panel comprising 60 members, including cultural figures like Santosh Sivan and Shyama prasad, to select and approve content.
- **Content Evaluation Criteria**: Three curators evaluate each submission based on its artistic, cultural, and infotainment merits. Only recommended content gets showcased on CSpace.
- **Transparent Operations**: CSpace operates on a pay-per-view basis, offering feature films at Rs 75 and shorter content at reduced prices, with transparent earning and revenue sharing policies.
- **Exclusive Content Selection**: CSpace exclusively showcases feature films released in cinema halls, along with short films, documentaries, and experimental films recommended by curators.

Over the Top (OTT) Streaming Platforms

- **About:** It is a media service offered directly to viewers via the Internet.
    - These platforms provide a variety of content and employ artificial intelligence to recommend content to users based on their previous viewing habits on the platform.
- **Examples:** Netflix, Disney+, Hulu, Amazon Prime Video, Hulu, Peacock, Curiosity Stream, Pluto TV, and so many more.

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PM UJJWALA YOJANA

(Syllabus: GS Paper 2 – Govt Scheme)

Centre extends Ujjwala subsidy by another year

The Hindu Bureau
NEW DELHI

Weeks ahead of the Lok Sabha elections, the Union Cabinet on Thursday decided to extend the subsidy of ₹300 per LPG cylinder for up to 12 refills per year till the end of next financial year. About 10.27 crore beneficiaries under the Pradhan Mantri Ujjwala Yojana (PMUY) will be covered by the scheme, said Union Commerce Minister Piyush Goyal after the meeting of the Cabinet. The total expenditure for the continuation of the scheme will be ₹12,000 crore.

The Centre had started a targeted subsidy of ₹200 per cylinder for up to 12 refills per annum to the PMUY consumers in May 2022. In October 2023, the Centre increased the subsidy to ₹300 per cylinder for up to 12 refills per annum.

Context: The Union Cabinet recently decided to extend the subsidy of ₹300 per LPG cylinder for up to 12 refills per year until the end of the next financial year.

PM Ujjwala Yojana

- **Launched**: May 2016.
- **Ministry**: Ministry of Petroleum and Natural Gas.
- **Objective:** To make clean cooking fuel such as LPG available to the rural and deprived households that were otherwise using traditional cooking fuels such as firewood, coal, cow-dung cakes, etc.
- **Target**: LPG connections to 5 crore women members of BPL households.
- **Expansion**: The scheme was expanded in April 2018.
- **Beneficiaries**: Women beneficiaries from 7 more categories- SC/ST, PMAY, AAY, Most backward classes, tea garden, forest dwellers, and Islands.
- **Expansion of Beneficiaries**: About 10.27 crore beneficiaries are set to benefit from the continuation of the Pradhan Mantri Ujjwala Yojana (PMUY).
- **Subsidy Structure**: Initially, a targeted subsidy of ₹200 per cylinder for up to 12 refills annually was provided to PMUY consumers.
    - In October 2023, the subsidy was increased to ₹300 per cylinder for the same refills per year.
- **Increased Consumption**: The average LPG consumption among PMUY consumers has risen by 29% from 3.01 refills in 2019-20 to 3.87 refills (till January 2024) pro-rated for 2023-24.
    - All PMUY beneficiaries are eligible for the targeted subsidy based on their increased consumption.

LPG Subsidy

- **About:** The Government of India provides gas subsidies as a type of financial assistance to beneficiaries. In an effort to help Indian households cope with inflation, this subsidy is provided on LPG cylinders.
- Beneficiaries receive the subsidy amount in their bank accounts.

FINANCIAL EXPRESS

Mar 7

FIRST UNDER-RIVER METRO TUNNEL

(Syllabus: GS Paper 3 – Infrastructure)

PM Modi inaugurates India's first under-river metro route in Kolkata!

Context: Prime Minister recently inaugurated a metro train service in Kolkata, marking the opening of India's first under-river metro tunnel.

India's First Under-River Metro Tunnel:

- **Kolkata Metro's East-West Corridor**: The under-river metro tunnel is an integral segment of Kolkata Metro's East-West Corridor, enhancing connectivity across the city.
- **Passes under the Hooghly River**: Serving as a vital link, the tunnel passes beneath the Hooghly River, connecting areas from Howrah Maidan to Esplanade.
- **Deepest Metro Station in the Country**: Within this stretch lies the Howrah Maidan station, positioned 32 meters below ground level, making it the deepest metro station in India.

Hooghly River:

- **Formation and Course**: It is a distributary of the Ganges, forms in Murshidabad, diverging into the Padma in Bangladesh. It flows westward, eventually emptying into the Bay of Bengal through a wide estuary.
- **Siltation and Water Source**: Siltation affects the upper reaches of the Hooghly, with its water primarily supplied by the Farakka Feeder Canal, diverted from the Ganges via the Farakka Barrage, ensuring consistent flow even during dry seasons.
- **Contributing Rivers**: The lower Hooghly receives contributions from rivers like Haldi, Ajay, Damodar, and Rupnarayan, enriching its flow and ecosystem.
- **Cities Along Its Banks**: Jiaganj, Azimganj, Murshidabad, and Baharampur.

INDIA TODAY Mar 6

Chandrayaan-4
(Syllabus: GS Paper 3 – Sci and Tech)

Chandrayaan-4 will be launched in two phases, both LVM-3, PSLV to be used

Context: ISRO is gearing up for the next lunar mission **'Chandrayaan-4',** to build on the accomplishments of Chandrayaan-3 mission (2023) while attempting more complex objectives.

Chandrayaan-4

- **Aim**: The primary objective is to land on the Moon and return rocks and soils (lunar regolith) to India for analysis.
- **Spacecraft Modules**: Consists of 5 modules including a lander, rover, propulsion module, descender module, ascender module, and transfer module.
  - **Propulsion Module**: Guides Chandrayaan-4 in lunar orbit before separation, similar to Chandrayaan-3.
  - **Descender Module**: Facilitates the lunar landing process, akin to the Vikram lander on Chandrayaan-3.
  - **Ascender Module**: Responsible for collecting and storing lunar samples before ejecting from the lander to begin the return journey.
  - **Transfer Module:** Grabs the ascender module, leaves lunar orbit, and heads back to Earth before detaching the capsule with the rock and soil samples.
  - **Re-entry Module**: Capsule carrying the lunar regolith that will undergo re-entry and land on Earth for further analysis.
- **Two Separate Launches**: Chandrayaan-4 is the first mission **involving 2 launch vehicles** to complete a single mission.
- **Launch Vehicles**: LVM-3 launches with 3 components (Propulsion Module, Descender Module, Ascender Module).
  - Polar Satellite Launch Vehicle (PSLV) launches the Transfer Module and the Re-entry Module.

TIMES OF INDIA

Mar 7

MAJULI MASKS

(Syllabus: GS Paper 1 – Art and Culture)

Majuli in Assam gets the prestigious GI tag for its mask-making and manuscript painting

Context: Recently, the traditional Majuli masks and Majuli manuscript painting in Assam were given a Geographical Indication (GI) tag.

Majuli Masks

- **Traditional Depiction in Bhaonas**: Handmade masks traditionally depict characters in bhaonas, theatrical performances with devotional messages, under the neo-Vaishnavite tradition introduced by Srimanta Sankardeva.
- **Inception through Chinha Jatra**: Srimanta Sankardeva established the art of masks through a play called Chinha Jatra.
- **Diverse Depictions**: Masks can portray gods, goddesses, demons, animals, and birds such as Ravana, Garuda, Narasimha, Hanuman, Varaha, and Surpanakha.
- **Variety in Size**: Range from masks covering just the face (mukh mukha) to those enveloping the entire head and body of the performer (cho mukha).
- **Materials Used**: Masks are crafted from bamboo, clay, dung, cloth, cotton, wood, and other materials found in the riverine surroundings of their makers.
- **Transition to Contemporary Settings:** Traditional practitioners aim to bring the art out of sattras, or monasteries, into contemporary contexts, revitalizing its relevance.
- **Significance of Sattras**: It established by Srimanta Sankardeva and his disciples, serve as centers of religious, social, and cultural reform.

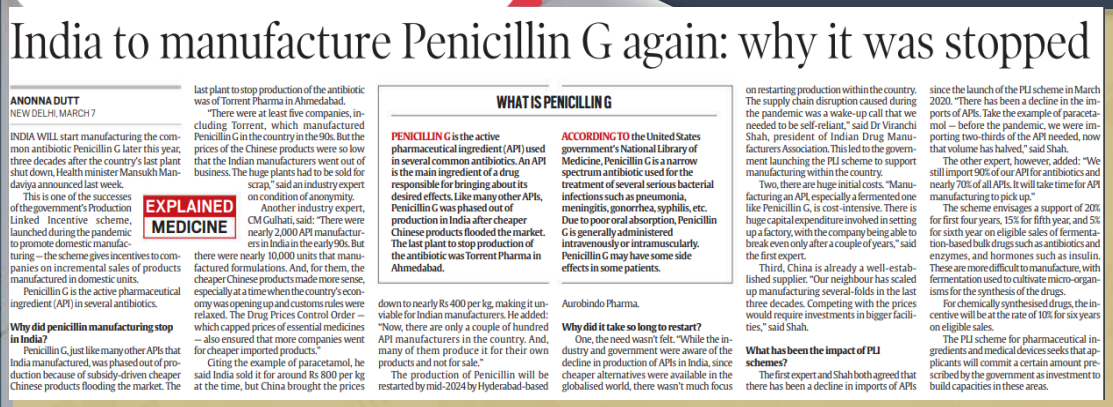
Majuli Manuscript Painting

- **Origin and Material**: Majuli manuscript painting, originating in the 16th century, is executed on sanchi pat, or manuscripts made from the bark of the sanchi or agar tree, utilizing homemade ink.
- **Earliest Examples**: The earliest illustrated manuscript is believed to be a rendering of the Adya Dasama of the Bhagwat Purana in Assamese by Srimanta Sankardev.
- **Patronage by Ahom Kings**: The art form received patronage from the Ahom kings and continues to be practiced in every sattra in Majuli.

INDIAN EXPRESS Explained

Penicillin G

(Syllabus: GS Paper 3 – S&T)



India to manufacture Penicillin G again: why it was stopped

ANONNA DUTT
NEW DELHI, MARCH 7

INDIA WILL start manufacturing the common antibiotic Penicillin G later this year, three decades after the country's last plant shut down, Health minister Mansukh Mandaviya announced last week.

This is one of the successes of the government's Production Linked Incentive scheme, launched during the pandemic to promote domestic manufacturing — the scheme gives incentives to companies on incremental sales of products manufactured in domestic units.

EXPLAINED MEDICINE

Penicillin G is the active pharmaceutical ingredient (API) in several antibiotics.

Why did penicillin manufacturing stop in India?

Penicillin G, just like many other APIs that India manufactured, was phased out of production because of subsidy-driven cheaper Chinese products flooding the market. The last plant to stop production of the antibiotic was of Torrent Pharma in Ahmedabad.

"There were at least five companies, including Torrent, which manufactured Penicillin G in the country in the 90s. But the prices of the Chinese products were so low that the Indian manufacturers went out of business. The huge plants had to be sold for scrap," said an industry expert on condition of anonymity.

Another industry expert, CM Gulhati, said: "There were nearly 2,000 API manufacturers in India in the early 90s. But there were nearly 10,000 units that manufactured formulations. And, for them, the cheaper Chinese products made more sense, especially at a time when the country's economy was opening up and customs rules were relaxed. The Drug Prices Control Order — which capped prices of essential medicines — also ensured that more companies went for cheaper imported products."

Citing the example of paracetamol, he said India sold it for around Rs 800 per kg at the time, but China brought the prices down to nearly Rs 400 per kg, making it unviable for Indian manufacturers. He added: "Now, there are only a couple of hundred API manufacturers in the country. And, many of them produce it for their own products and not for sale."

The production of Penicillin will be restarted by mid-2024 by Hyderabad-based Aurobindo Pharma.

WHAT IS PENICILLIN G

PENICILLIN G is the active pharmaceutical ingredient (API) used in several common antibiotics. An API is the main ingredient of a drug responsible for bringing about its desired effects. Like many other APIs, Penicillin G was phased out of production in India after cheaper Chinese products flooded the market. The last plant to stop production of the antibiotic was Torrent Pharma in Ahmedabad.

ACCORDING TO the United States government's National Library of Medicine, Penicillin G is a narrow spectrum antibiotic used for the treatment of several serious bacterial infections such as pneumonia, meningitis, gonorrhea, syphilis, etc. Due to poor oral absorption, Penicillin G is generally administered intravenously or intramuscularly. Penicillin G may have some side effects in some patients.

Why did it take so long to restart?

One, the need wasn't felt. "While the industry and government were aware of the decline in production of APIs in India, since cheaper alternatives were available in the globalised world, there wasn't much focus on restarting production within the country. The supply chain disruption caused during the pandemic was a wake-up call that we needed to be self-reliant," said Dr Vitanchi Shah, president of Indian Drug Manufacturers Association. This led to the government launching the PLI scheme to support manufacturing within the country.

Two, there are huge initial costs. "Manufacturing an API, especially a fermented one like Penicillin G, is cost-intensive. There is huge capital expenditure involved in setting up a factory, with the company being able to break even only after a couple of years," said the first expert.

Third, China is already a well-established supplier. "Our neighbour has scaled up manufacturing several-folds in the last three decades. Competing with the prices would require investments in bigger facilities," said Shah.

What has been the impact of PLI schemes?

The first expert and Shah both agreed that there has been a decline in imports of APIs since the launch of the PLI scheme in March 2020. "There has been a decline in the imports of APIs. Take the example of paracetamol — before the pandemic, we were importing two-thirds of the API needed, now that volume has halved," said Shah.

The other expert, however, added: "We still import 90% of our API for antibiotics and nearly 70% of all APIs. It will take time for API manufacturing to pick up."

The scheme envisages a support of 20% for first four years, 15% for fifth year, and 5% for sixth year on eligible sales of fermentation-based bulk drugs such as antibiotics and enzymes, and hormones such as insulin. These are more difficult to manufacture, with fermentation used to cultivate micro-organisms for the synthesis of the drugs.

For chemically synthesised drugs, the incentive will be at the rate of 10% for six years on eligible sales.

The PLI scheme for pharmaceutical ingredients and medical devices seeks that applicants will commit a certain amount prescribed by the government as investment to build capacities in these areas.

Context: India will start manufacturing the common **antibiotic Penicillin G** later this year, **three decades after the country's last plant shut down.**

- This is one of the successes of the government's Production Linked Incentive scheme launched during the pandemic to promote domestic manufacturing the scheme gives incentives to companies on incremental sales.

Penicillin G

- **About**: Penicillin G is the active pharmaceutical ingredient (API) found in common antibiotics.
- **Production:** The production of Penicillin G in India ceased due to the influx of cheaper Chinese alternatives.
- **Usage and Scope of Penicillin G**: According to the United States government's National Library of Medicine, Penicillin G is a narrow spectrum antibiotic.
  - It is employed in the treatment of serious bacterial infections such as pneumonia, meningitis, gonorrhea, syphilis, etc.
- **Administration and Absorption of Penicillin G**: Due to poor oral absorption, Penicillin G is commonly administered intravenously or intramuscularly.
- **Side Effects**: Penicillin G may exhibit side effects in some patients, emphasizing the importance of careful administration and monitoring.

Reasons for the Halt in Penicillin Manufacturing in India

- **Subsidy-driven Competition from China**: Penicillin G manufacturing in India ceased due to the influx of cheaper Chinese products, driven by subsidies, which flooded the market.
- **Impact on Indian Companies**: The last plant to discontinue Penicillin G production was owned by Torrent Pharma in Ahmedabad. Several other Indian companies that once manufactured the antibiotic faced similar challenges.
- **Price Disparity**: Despite having at least five companies producing Penicillin G in the 90s, Indian manufacturers couldn't compete with the remarkably low prices of Chinese products.
- **Business Closure and Asset Disposal**: The competitive pressure forced Indian manufacturers to cease operations. Consequently, the once thriving Penicillin G plants had to be sold for scrap, marking the end of an era.

Impact of PLI Schemes

- **Decrease in API Imports**: There has been a decline in the imports of APIs since the launch of the PLI scheme.
- **Example of Paracetamol**: Take the example of paracetamol — before the pandemic, we were importing two-thirds of the API needed, now that volume has halved.
- **PLI Scheme Incentive Structure**: The scheme envisages a support of 20% for the first four years, 15% for the fifth year, and 5% for the sixth year.
- **Eligible Sales:** Support is provided on eligible sales of fermentation-based bulk drugs such as antibiotics, enzymes, and hormones like insulin.

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