SNAPSHOTS

Choking oceans
A new study that uses climate models to predict how the reduction of dissolved oxygen in water will take place finds that this process began in regions of the ocean that support marine life around 2021. The study, published in *Geophysical Research Letters*, predicts that this deoxygenation would begin affecting all parts of the ocean by 2080. This can impact marine ecosystems worldwide.

Moon magic
Scientists conjecture that the size of our Moon may play a vital role in making the Earth what it is. Added to this, researchers from Rochester University in the U.S. estimate that planets with masses more than six times that of the Earth are incapable of having such a large moon. This constraint can guide astronomers to study exomoons to spot Earth-like bodies.

IGIB develops future-proof primers, kits for RT-PCR test

The pool of primers has been developed to target regions of the virus which are unlikely to undergo mutations

R. PRASAD

Using its expertise in genome sequencing and analysis pipeline of genome sequence data, the Delhi-based CSIR lab Institute of Genomics and Integrative Biology (IGIB) has successfully developed a unique pool of primers and kits to be used in RT-PCR testing of SARS-CoV-2 virus. The most distinguishing aspect of the work carried by a team led by Dr. Sridhar Sivasubbu and Dr. Vinod Scaria at IGIB that was developing primers that will not be affected by mutations seen in SARS-CoV-2 variants. This may allow the primers to detect any new SARS-CoV-2 variants that might emerge immaterial of the novel mutations that the variants might have. The primers developed in a way future-proofs the ability to detect without fail any new SARS-CoV-2 variants that may emerge.

Many mutations

The Omicron variant, for instance, has 32 mutations in the spike protein alone. None of these mutations were seen in other variants that emerged earlier – the Alpha, Beta, Gamma and Delta. Each new variant that emerges develops a unique set of mutations that makes it more transmissible and/or causes severe disease.

RT-PCR tests currently available contain primers for two or more genes. The gene targets selected could be a combination of S gene, N gene and E- gene.

Based on over 40,000 high-quality SARS-CoV-2 virus genome sequence data available in the public domain including a significant large number of genome sequences from India, Dr. Sivasubbu's team, which includes two PhD students – Paras Sehgal and Gyan Ranjan, was able to identify nearly 80,000 unique variants. The high number of variants seen is because SARS-CoV-2 is a rapidly mutating virus and tends to collect mutations during infection. The SARS-CoV-2 is naturally endowed to collect about one mutation every 10-14 days.

"Though the SARS-CoV-2 is a rapidly mutating virus, we found that not all regions of the virus were accumulating mutations at the same rate. There are some regions of the virus which collect mutations at a fast rate while some other regions tend to collect mutations at a slow rate," says Dr. Sivasubbu.

"We at IGIB already had an algorithm that allowed us to look at the conserved regions that were not prone to accumulating mutations.. This allowed us to analyse which regions of the virus are conserved and which were not," says Dr. Sivasubbu.

Conserved region of a virus contains genes which are very essential and hence either do not undergo any mutations or such mutations happen rarely.

In parallel, the IGIB researchers had also collected information about primers used in commercial and non-commercial tests across the world. "Once we had the mutation map of the SARS-CoV-2 virus, and by using the information gathered by studying the primers used across the world, we found that a majority of primers designed and used were overlapping with the regions of the virus collecting significant number of mutations," he says.

Strategic problem

"The primers widely in use have a small strategic problem. We realised that at some point in the future, the existing primers used in RT-PCR test kits for detecting SARS-CoV-2 virus would not be able to bind properly to the genome leading to erroneous results," Dr. Sivasubbu says. The primers were tested to detect all the SARS-CoV-2 variants – the Alpha, Beta, Gamma, Delta and Omicron. Based on the knowledge of the conserved regions in the virus, the team developed a pool of primers that would be future-proof. Each RT-PCR test uses at least two gene targets and each gene target requires a pair of primers. The pool of primers developed by IGIB will allow them to be used in various combinations.

"The pool of primers has been developed to target regions of the virus which are unlikely to undergo mutations. So the primers developed for RT-PCR tests will perform very well when new variants emerge," says Dr. Anurag Agrawal, Director of IGIB.

The development of the mutation map of SARS-CoV-2 virus and the pool of primers were done in collaboration with Siemens Healthcare Private Limited. The technology has been transferred to the company and the product tested and approved by ICMR and launched on January 25 this year.

Siemens will be manufacturing the tests (IMDX SARS-CoV-2 Multiplex ORF1ab/N gene) at its new plant at Vadodara. According to the company spokesperson, the tests have 100% sensitivity and specificity. The plant has a capacity to manufacture 12 million tests per month. "The company will strive to make it affordable and accessible," the spokesperson said.

Used worldwide

The project began in May-June 2020 when Illumina launched its new Covidseq Next-Generation Sequencing for SARS-CoV-2 virus and the first global field validation was carried out in India at IGIB. Nearly 1,700 genome sequence samples from seven States were sequenced at IGIB using Covidseq Next-Generation Sequencing as part of the field validation. Once the field validation by IGIB was completed, countries across the world started using Illumina's new Covidseq genome sequencing protocol. By the end of December 2020, a large number of SARS-CoV-2 genomes were sequenced across the world, including 7,000 from India. Of the 7,000 genomes sequenced in India, 50% were exclusively by IGIB in collaboration with other entities in India.

A robust test against mutations

The CSIR Institute of Genomics and Integrative Biology at Delhi has developed a unique pool of primers and kits to be used in RT-PCR testing of SARS-CoV-2 virus

- Currently available RT-PCR tests contain primers for two or more genes
- The SARS-CoV-2 virus is naturally endowed to collect about one mutation every 10-14 days
- Some regions of the virus collect mutations at a faster rate than others
- Using an algorithm they already had, the researchers analysed which regions of the virus are conserved and which were not
- Based on the knowledge of the conserved regions in the virus, the team developed a pool of primers that would be future-proof
- The technology has been transferred to Siemens Healthcare and the product tested and approved by ICMR and launched on 25 January this year

Antarctic microbes may help in plastic clean-up

REUTERS

A team of Argentine scientists is using microorganisms native to Antarctica to explore the idea of cleaning up pollution from fuels and, potentially, plastics in the pristine expanses of the white continent.

The tiny microbes munch through the waste, creating a naturally occurring cleaning system for pollution caused by diesel that is used as a source of electricity and heat for research bases in the frozen Antarctic.

The continent is protected by a 1961 Madrid Protocol that stipulates it must be kept in a pristine state.

The research on how the microbes could help with plastic waste could have potential for wider environmental issues.

"This work uses the potential of native microorganisms - bacteria and fungi that inhabit the Antarctic soil, even when it is contaminated," said Dr. Lucas Ruberto, a biochemist.

"What for us is a contaminant, for them can be food."

Ruberto said that the team helped the microbes with nitrogen, humidity and aeration to optimise their conditions.

"Basically with that we get the microorganisms to biologically reduce, with a very low environmental impact, the level of contaminants," he told *Reuters* by Zoom. The team has now started to research how the microbes could help clean up plastic waste elsewhere.

"This year we incorporated as one of the group's projects the search for indigenous microorganisms that are capable of degrading plastic," said Nathalie Bernard, a biochemist and specialist in plastic biodegradation.

The researchers collect samples of plastic from the Antarctic seas and study to see if the microorganisms are eating the plastics or simply using them as rafts.

"If we find that it is indeed degrading plastic, the next step would be to understand how it does that, so that in the long-term we could find a way to put together a biotechnology process for low-temperature polymer degradation," Bernard added.

RT-PCR: Cycle threshold value does not hold clinical relevance

A survey of 700 labs in the U.S. found that the Ct values could vary by up to 12 cycles for the same target gene across labs

LANCELOT PINTO

The art of medicine is taught by the bedside. It involves detailed history-taking, followed by a physical examination which employs the senses of the physician. Humans, however, prefer concrete numbers to abstract skill and intuition. Unfortunately, most of these numbers do not have any clinical relevance. Yet, they continue to be used indiscriminately to drive irrational and often expensive treatments, including unnecessary hospitalisations. At present, the most often repeated number appears to be the cycle threshold value (Ct value) reported on an RT-PCR at the time of diagnosis.

RT-PCR test

An RT-PCR test detects genetic material in a sample (for COVID, the sample used is a swab from the throat and nose). The sample, after processing, is placed in an RT-PCR machine where the viral genetic material is amplified. So two copies of genetic material become four, four become eight in the next cycle and so on. There are fluorescent marker labels present in the mixture, which attach to the genetic material and release a fluorescent dye, which is measured by the machine as it happens ("real-time"). When the fluorescence crosses a certain threshold, the machine labels the sample as testing positive, and the number of cycles that the sample goes through before reaching this threshold is called the cycle threshold (or Ct value). It follows, therefore, that greater the quantum of genetic material (or virus) in the sample, fewer the cycles to reach the threshold of detection. For approximately every 3.3 rise in the Ct value, the quantum of starting genetic material is likely to be tenfold lower.

How it works: When the processed sample is placed in an RT-PCR machine, the viral genetic material is amplified. Two copies of genetic material become four, four become eight in the next cycle, and so on. • GETTY IMAGES

When a swab is done in a symptomatic individual at the peak of early symptoms, the Ct value is more often than not low. This leads patients to believe that they are at a high risk of having severe disease. The consequent fear and anxiety lead to frequent blood tests, scans and a gamut of unproven therapies, fewer the cycles to reach the threshold of detection. For approximately every 3.3 rise in the Ct value, the quantum of starting genetic material is likely to be tenfold lower.

> **The Ct value is dynamic and can evolve rapidly. A low Ct value at the time of diagnosis does not mean that it will stay low the next day (as the body's immunity kicks in)**

When a swab is done in a symptomatic individual at the peak of early symptoms, the Ct value is more often than not low. This leads patients to believe that they are at a high risk of having severe disease. The consequent fear and anxiety lead to frequent blood tests, scans and a gamut of unproven therapies. This is unscientific for several reasons.

Dynamic measure

Firstly, the Ct value is a dynamic measure and can evolve rapidly. A low Ct value at the time of diagnosis does not mean that it will stay low the next day (as the body's immunity kicks in). Similarly, a swab done very early in the infection may reveal a high Ct value, which if repeated a day or two later, may reveal a lower Ct value. It is possibly for this reason that Ct values have not been convincingly correlated with disease severity, and serve no role in predicting the trajectory for a patient (yet, this is commonly used as an argument to prescribe tests and medicines). Secondly, several technical and logistical factors influence the value: the way specimens are collected (a quick superficial swab versus an aggressive swab), the type of specimen (nasal versus pharyngeal versus nasopharyngeal), the medium in which the swab is transported, the time lag between collection of the specimen and processing. All of this can influence the quantum of viral genetic material present, and subsequently, the Ct value. In a letter published in *Clinical Infectious Diseases*, the College of American Pathologists (CAP) Microbiology Committee reports how a survey of 700 laboratories in the U.S. using standardised proficiency testing material from the same batch found a variability in Ct values by 14 cycles. Even within the same test at the same lab the Ct values could vary by 3 cycles for different target genes, and up to 12 cycles for the same target gene across labs. The letter reiterated the fact that these RT-PCR assays were not approved to be used quantitatively, but as a positive/negative test.

The caveats

Does the Ct value have any real value at all? Studies suggest that when used early in the disease, it may correlate with transmissibility at the time of testing. This, again, needs to be viewed with the caveats of the dynamic nature of the value, and the unfeasibility of serial testing, in addition to the technical variability alluded to above. When used to decide when a person can come out of isolation in high-risk settings such as hospitals, the Ct value may be a guide in older patients, those who are immunocompromised and those who have severe disease, all of which are patient groups in whom prolonged viral shedding has been reported.

The knowledge of the Ct value offers no insight to the treating clinician or the patient, and amounts to "noise" without a meaningful clinical "signal". It causes panic, and the value is being used to drive irrational testing and treatment measures. Labs should consider not reporting Ct values on a routine basis.

(Lancelot Pinto is a Consultant Respirologist at P.D. Hinduja National Hospital and Medical Research Centre, Mumbai)

A quantum solution to a 243-year-old maths problem

The 36 officers puzzle was first posed by Swiss mathematician Leonhard Euler in 1779

SHUBASHREE DESIKAN

A famous problem that has perplexed mathematicians since 1779 has been settled, but with a quantum twist, by a collaboration of six Indian and Polish researchers, two of whom are from Indian Institute of Technology (IIT) Madras. The researchers have solved using matrix methods, the quantum equivalent of the classical problem. This could potentially be used in quantum secret sharing protocols - which will be useful when quantum computers come into play; parallel teleportation, which is a way to transferring information across distances; and even perhaps may come in useful in solving the problem of quantum gravity.

Long-lived puzzles

Numerical puzzles often appear simple when phrased but can occupy mathematicians for hundreds of years. The 36 officers puzzle was first posed by Swiss mathematician Leonhard Euler.

The puzzle can be described as follows:

There are six regiments, each containing six officers of six different ranks. The question is, can you place the 36 officers in a square arrangement with six rows and six columns such that no row or column repeats an officer's rank or regiment?

This puzzle was guessed to be unsolvable by Euler in 1779 and proven to be so by the French amateur mathematician G. Tarry in 1901.

Squares such as this are often encountered in Sudoku and other magic squares of size n. Euler's 36 officers problem (for which n=6) and generalisations of it to other values of n = 2,3, etc are examples of Orthogonal Latin Squares (OLS). In this case, OLS solutions exist for all values of n except 2 and 6.

A quantum solution

Now Tarry had explicitly shown that n = 6 (36 officers puzzle) has no solution. But suppose the officers were not classical objects but were quantum entities, would this still be true? This is what physicists who joined the group of problem solvers started asking.

Classically, this problem cannot be solved, but what if the officers were quantum entities?

Here, it is necessary to understand "quantum entanglement".

To get an idea, take 2 boxes, one in Chennai and other in Shopian, one containing a red (R) cube and other a blue (B) one. We think of the state as RB or BR depending on if the Chennai box contains a red or blue cube. A quantum entangled state, is a weird "superposition" of these two which physicists represent by RB+BR. The strange thing about this state is that opening the Chennai box can randomly reveal it to contain a blue or red cube and the nature of entanglement is to ensure that the other distant box contains a cube of the opposite colour. Repeating the experiment with an identical set of boxes, can result in the reverse colours immediately. This leads to what is popularly known as ``spooky action at a distance", and maximal entanglement leads to perfect correlation.

Entangled dice: The existence of a quantum solution to the 36 officers problem implies that 4 unbiased dice can be prepared so that observing any two of them can be used to perfectly predict the other two. • PAULINA RAJCHEL-MIELDZIOC

> **Given that we were studying a 36-dimensional matrix, it was like looking for a needle in a haystack.**
>
> ARUL LAKSHMINARAYAN

Another famous example is that of Schrodinger's cat.

Officers entangled

In the case of quantum officers, the state may similarly exist in a superposition of officer states. One of the things the researchers have shown is that there is a connection between the classical OLS solutions, whenever it exists, and the nature of the quantum state associated with it. It can be used to construct what are called Absolutely Maximally Entangled (AME) states. These are states in which any subset of the entities is maximally correlated with the others in the sense of the red and blue cubes above.

In the case Euler's problem, starting from the quantum equivalent of what is nearly an OLS solution, the researchers run an algorithm that tunes it and tries to approach the perfect AME state which will be the quantum OLS in the forbidden dimension n=6. "Given that we were studying a 36-dimensional matrix, which contained 1,296 entries, it was like looking for a needle in a haystack," says Arul Lakshminarayan from IIT Madras, who led the study along with Karol Zyczkowski of Jagiellonian University, Krakow, Poland.

"When we ran the algorithm, we realized that we should not start from the neighbourhood of the approximate solution but somewhat away from it," says Suhail Ahmad Rather, who is a PhD student in his fourth year at IIT Madras and one of the first authors of the paper which has been accepted for publication in *Physical Review Letters*. "There is an art involved in it," says Prof. Lakshminarayan.

An amusing twist to the story comes in when you consider the three amplitudes a, b and c, that made up the solution. The three form a Pythagorean triad, that is, a2 + b2 = c2. Further the ration b/a was the golden mean (approximately equal to 1.618) which is seen in many natural and constructed patterns. Is there then something more to the story? Is this, as Prof. Lakshminarayan feels, the tip of an iceberg?

Question Corner

Earliest solar storm

What is the earliest record of a solar storm?

Through analysis of ice cores from Greenland and Antarctica, a research team has found evidence of an extreme solar storm that occurred about 9,200 years ago. What puzzles the researchers is that the storm took place during one of the sun's more quiet phases – during which it is generally believed our planet is less exposed to such events. It is currently believed that solar storms are more likely during the so-called sunspot cycle. Research now shows *(Nature Communications)* that this may not always be the case for very large storms.

"We have studied drill cores from Greenland and Antarctica, and discovered traces of a massive solar storm that hit Earth during one of the Sun's passive phases about 9,200 years ago," Raimund Muscheler, geology researcher at Lund University says in a press release.

The researchers scoured the drill cores for peaks of the radioactive isotopes beryllium-10 and chlorine-36. These are produced by high-energy cosmic particles that reach Earth, and can be preserved in ice and sediment. Cosmogenic radionuclides, such as carbon-14, beryllium-10 and chlorine-36, are produced within the Earth's atmosphere as a result of the interactions of galactic cosmic rays (GCR) with its constituents and are modulated by the solar and the Earth's magnetic fields. The enhanced flux of relatively lower energy particles during a solar energetic particle event (SEP) can trigger additional production of cosmogenic radionuclides, leaving an imprint in environmental archives.

Readers may send their questions / answers to questioncorner@thehindu.co.in

Still unknown: U.S. Secretary of State Antony Blinken speaking on the 'Havana Syndrome.' • AP

Mystery illness

What is the 'Havana Syndrome' that has afflicted many American diplomats around the world?

SRIRAM LAKSHMAN

The story so far: A recent U.S. intelligence report says that 'Havana Syndrome' –a collection of symptoms and related brain injuries, reported by U.S. officials, particularly diplomats in embassies –could be caused by pulsed electromagnetic energy or close-range ultrasound. These findings are somewhat different in tone from a Central Intelligence Agency (CIA) report from January, which, in a majority of cases, suggested other causes for the phenomena, such as underlying medical conditions.

What is it?

■ 'Havana Syndrome' is a colloquial name given to a set of symptoms such as dizziness, hearing loss, headaches, vertigo, nausea, memory loss and possible brain injuries first reported by 16 U.S. Embassy staff and their family members in Havana, Cuba, in 2016-17. There have been other instances of the phenomenon, which has mostly impacted U.S. officials. A staffer traveling in India with CIA Director Bill Burns complained of 'Havana Syndrome' like symptoms last September. Officials were reportedly very concerned, as per reports, that an adversary could have obtained a confidential CIA travel itinerary. In August, Vice President Kamala Harris's arrival in Vietnam was delayed after reports of an 'anomalous health incident' or AHI, in Hanoi. Other countries from which American officials have reported AHIs include Colombia, Russia, China and Uzbekistan. Cases ascribed to the 'Havana Syndrome' have also been reported from within the U.S.

What did the latest investigation find?

■ A panel, constituted by the Office of the Director of National Intelligence and the CIA, said on Wednesday that some of the 'Havana Syndrome' cases could have been caused by pulsed electromagnetic energy in the radio frequency. The results of the investigation did not point to who may have been behind the phenomenon, nor commented on their motivations.

A partially redacted report summary finds that the symptoms of AHI are "genuine and compelling." Some individuals were affected in the same space, and they showed temporary elevations in biomarker levels that are linked to cellular injury. Significantly, the investigation found that a subset of the AHIs could have been caused by external stimuli and could not be explained by known medical and environmental conditions. Psychosocial factors alone do not explain the core characteristics, the report finds, although they may cause other incidents or contribute to long-term effects. These other incidents could occur via hypervigilance or reactions to stress especially among individuals who are security-oriented. The investigation identified four "core characteristics" that describe all AHIs. First, a hearing impact. Second, the existence of other almost simultaneous symptoms such as a loss of balance or vertigo. Third, a "strong sense of locality or directionality." Fourth, the absence of other conditions, medical or environmental, that could have caused these symptoms. The core characteristics could plausibly be explained by pulsed electromagnetic energy, possibly sent using nonstandard antennas and techniques, from as far as "tens of hundreds of metres", including through building materials," the report says. Ultrasound, from a nearby source, could also explain the AHIs, the panel finds, as it rules out biological and chemical agents, ionising radiation, bulk-heating from electromagnetic energy, and sound of various frequencies as "implausible explanations."

> A panel, constituted by the Office of the Director of National Intelligence and the CIA, has said that some of the 'Havana Syndrome' symptoms could have been caused by pulsed electromagnetic energy in the radio frequency

Are the latest results consistent with earlier findings?

■ The interim results of a CIA investigation into 'Havana Syndrome' were reported by the American press in January. The investigation concluded, for the time being at least, that it was unlikely that a foreign power was attempting, in a sustained manner, to attack U.S. officials and diplomats. The majority of the cases were thought to be caused by medical conditions –including undiagnosed bacterial infections and brain tumours, the *Associated Press* reported. Only in a "few dozen" cases was the jury still out and foreign interference had not been ruled out in these instances. Lawmakers criticised the CIA for releasing an interim report that was inconclusive. While the panel's investigation does not contradict the CIA's findings, the thrust of it is different, pointing to the plausible involvement of an external frequency source and thereby leaving open the possibility that an actor –such as a country adversarial to the U.S. –might be behind some of the cases.

What happens next?

■ The publicly available part of the recommendations of the latest study seem to suggest a focus on collecting more data and identifying AHIs more clearly, such as by developing more sensitive and specific tests for biomarkers and rolling out more objective clinical measurements for the incidents. Another recommendation is communicating better to U.S. government employees in order to reduce the impacts of psychosocial factors and neurological disorders, irrespective of their causes. U.S. government bodies, such as the CIA and the State Department, also continue to investigate the source of these possible attacks.

Crypto riddle: tax first, recognition later?

What is the debate around the legality of cryptocurrencies after the announcement of a 30% tax?

SRIRAM SRINIVASAN

The story so far: In her Budget speech, Finance Minister Nirmala Sitharaman introduced a 30% tax on income earned from transfer of virtual digital assets. The Government is yet to recognise cryptocurrencies, including Bitcoin and Ethereum, but this ambiguity has not stopped people from trading in digital assets in large numbers, which apparently forced the Government's hand in announcing a tax on such transactions. At a press conference after presenting the Budget, Ms. Sitharaman said consultation is underway with stakeholders on digital assets, adding that there is no clarity yet on how the Government of India will regulate cryptocurrencies.

What would be the tax component for income from virtual digital assets?

■ The Budget has proposed a 30% tax on income from the "transfer of any virtual digital asset." Secondly, except for the cost of acquisition, no deduction will be allowed. Thirdly, losses from such transfers cannot be set off against any income. Fourthly, tax will be deducted at source at the rate of 1%, so as to capture transaction details, thus initiating a tax deducted at source (TDS) mechanism.

What has been India's approach to cryptocurrencies?

■ The Government and the Reserve Bank of India have in the past cautioned people against considering cryptocurrencies as legal tender. The fact that transactions using such currencies can easily bypass the tax net, and therefore be used for illicit transactions, have been bothering governments across the world.

The Reserve Bank of India, in 2018, directed banks not to provide services to the cryptocurrency ecosystem. The Supreme Court set this aside, calling the move disproportionate, given that such currencies were not banned in the country. A law on cryptocurrencies, which was supposed to have been brought in last year, is yet to see the light of day. The broad expectation about the Government's approach to this was set by a 2019 report by an inter-ministerial committee which recommended a ban on all cryptocurrencies.

> There has been a phenomenal increase in transactions in virtual digital assets, said Nirmala Sitharaman, and the magnitude and frequency of these transactions have made it imperative to provide for a specific tax regime

Yet, through all this, cryptocurrency trading has grown in India. In fact, Ms. Sitharaman noted in her Budget speech that "there has been a phenomenal increase in transactions in virtual digital assets. The magnitude and frequency of these transactions have made it imperative to provide for a specific tax regime."

How has the cryptocurrency ecosystem read this move?

■ All major players have welcomed it. They have understood it as a move that provides clarity and "mainstreams" their industry. Nischal Shetty, the CEO of cryptocurrency exchange WazirX, tweeted that the Government has legitimised the industry. He wrote: "This doubles down on the fact that virtual digital assets are legal in India."

The industry is now ready to lobby with the Government to bring down the tax on par with other asset classes.

Does this mean that cryptocurrencies are legal?

■ Statements by ministers and bureaucrats after the Budget seem to suggest that the legality of cryptocurrencies in the country is still a grey area, never mind the tax.

In an interview with Bloomberg TV, Finance Secretary T.V. Somanathan said: "They are in a grey area. It's not illegal to buy and sell crypto."

He further said, "We have now put in a taxation framework that treats crypto assets the same way we treat winnings from horse races, or from bets and other speculative transactions."

Union Minister Rajeev Chandrasekhar told NDTV a day after the Budget, "Yesterday's Budget has given a direct answer –crypto won't be banned."

However, Ms. Sitharaman, in an interview with Times Now, seemed to suggest that the question on the ban hasn't been decided one way or another. She also seemed to divorce the taxability issue from the legitimacy issue.

She said, "There is no way anything can stop a sovereign Government from taxing an activity. Banning or not banning will come subsequently when the consultations give me inputs. But would you say till then I do not even tax the huge profits being transacted? I will. Legitimate or not legitimate is a different question, taxing is completely my prerogative."

In recent days, experts have pointed out that the legal position is in sync with this thought process.

For instance, the verdict in the *Commissioner of Income Tax v. Piara Singh* in 1980 quoted from the judgment in the *Commissioner of Income Tax, Gujarat v. SC Kothari*, in which the court had observed that "if the business is illegal, neither the profits earned nor the losses incurred would be enforceable in law. But, that does not take the profits out of the taxing statute."

Why are India's imports from China rising?

If trade is booming, what is the state of other aspects of economic relations, including investments?

ANANTH KRISHNAN

The story so far: While many countries, including India, have spoken of the need to reduce reliance on China particularly in the wake of COVID-19 and disruption to supply chains, trade figures released last month showed imports have only continued to surge in 2021, rebounding after a fall in trade in 2020 because of the pandemic. The rising trade comes amid continuing tensions with China along the Line of Actual Control (LAC), where disengagement negotiations have been slow moving. The rising trade does not, however, suggest a return to normalcy in relations. Other areas, such as investment, remain in a deep freeze amid the continuing chill in bilateral relations.

What did India import from China in 2021?

■ India's trade with China in 2021 reached $125.6 billion, according to figures released in January by China's General Administration of Customs (GAC). This was the first time that trade crossed the $100 billion mark. India's imports from China accounted for $97.5 billion, while exports reached $28.1 billion, both records. Compared to 2019 –trade declined substantially in 2020 because of the pandemic, which exaggerates the year-on-year increase –imports are up 30%. Exports to China, meanwhile, are up by as much as 56%. The trade deficit, a long-term source of concern for India, is up by 22% since 2019, having declined last year.

What is driving India's imports?

■ India's biggest imports are electrical and mechanical machinery, a range of chemicals that are intermediate imports used by industries, active pharmaceutical ingredients (APIs), auto components, and since 2020, a large amount of medical supplies. According to figures available with India's Ministry of Commerce, all those key imports continued to rise in 2021. The total value of the top 100 import categories –each of which accounts for more than $100 million in imports –was up by $16 billion in the last year, reaching $45 billion. The top items included both finished goods such as integrated circuits (up 147%), laptops and computers (up 77%) and oxygen concentrators (up four-fold) and intermediate products such as chemicals (of these, acetic acid imports were up eight-fold).

• GETTY IMAGES

What does the recent trend of trade figures suggest?

■ Experts say India's dependence on China for finished goods has shown no signs of easing, which is a cause for concern. The rise in intermediate imports is, however, less of a concern as it is a sign of industrial recovery and greater demand for inputs. While Indian exports to China have also grown, up by more than 50% in the last two years, these are mostly raw materials such as ores, as well as cotton and seafood, and not finished products. The five-year trend shows the trade deficit continues to widen. The deficit has grown from $51.8 billion in 2017 to $69.4 billion in 2021.

What are the implications for India-China relations?

■ While trade continues to boom, other aspects of economic relations have dramatically changed in the past two years. In the wake of the LAC crisis starting April 2020, the message from New Delhi was that it cannot be business as usual while there are tensions along the border. Investments from China in the past year have plunged amid tighter curbs. In the tech and telecom space, the once rapidly increasing Chinese investments in start-ups including from tech giants such as Alibaba and Tencent, has come to an abrupt halt, more than 200 apps remain banned, and Chinese firms have been kept out of 5G trials so far. India has also tightened scrutiny on Chinese firms in India, recently conducting tax investigations into companies including smartphone manufacturer Xiaomi. Those moves last month prompted a statement from China's Ministry of Commerce calling on India to "provide a fair, transparent and non-discriminatory environment for Chinese businesses". While the trade pattern is unlikely to dramatically change in the near future, even as New Delhi considers a long-term plan to reduce some of these import dependencies by either accelerating long-discussed but slow-moving plans to manufacture some of these critical goods in India or source elsewhere, the rest of the India-China economic relationship still remains somewhat in a state of freeze as talks continue to resolve the tensions along the border.

When will new Vande Bharat trains be launched?

Who is designing the 400 trains? Where will they be manufactured? What is distinct about them?

YUTHIKA BHARGAVA

The story so far: Finance Minister Nirmala Sitharaman has in the Union Budget for 2022-2023 proposed the development and manufacture of 400 new Vande Bharat trains in the next three years. In her speech, Ms. Sitharaman said these would be "new generation" trains with better energy efficiency and passenger riding experience.

What is it?

■ The Vande Bharat train is an indigenously designed and manufactured semi high speed, self-propelled train that is touted as the next major leap for the Indian Railways in terms of speed and passenger convenience since the introduction of Rajdhani trains. These trains, dubbed as Train 18 during the development phase, operate without a locomotive and are based on a propulsion system called distributed traction power technology, by which each car of the train set is powered. The Vande Bharat coaches incorporate passenger amenities including on-board WiFi entertainment, GPS-based passenger information system, CCTVs, automatic doors in all coaches, rotating chairs and bio-vacuum type toilets like in aircraft.

The first Vande Bharat was manufactured by the Integral Coach Factory (ICF), Chennai, in about 18 months as part of the 'Make in India' programme, at a cost of about ₹100 crore. The current version of the train has 16 coaches with 14 ordinary chair cars and two executive class chair cars. The train has a passenger carrying capacity of more than 1,100 people. It can achieve a maximum speed of 160 kmph due to faster acceleration and deceleration, reducing journey time by 25% to 45%. It also has an intelligent braking system with power regeneration for better energy efficiency thereby making it cost, energy and environment efficient. The Vande Bharat was India's first attempt at adaptation of the train set technology compared with conventional systems of passenger coaches hauled by separate locomotives. The train set configuration though complex is faster, easier to maintain, consumes less energy, and has greater flexibility in train operation, according to the Indian Railways.

> The train has a passenger carrying capacity of more than 1,100 people. It can achieve a maximum speed of 160 kmph due to faster acceleration and deceleration, reducing journey time by 25% to 45%

How many Vande Bharat trains do the Railways currently operate?

■ Currently, two Vande Bharat Expresses are operational –one between New Delhi and Varanasi and the other from New Delhi to Katra. Following this, the Railways had issued a more than ₹2,000 crore contract for making 44 more such trains. However, the first tender was cancelled and reissued to align it with the 'Make in India' policy. For the first time, the tender required a minimum 75% local content requirement of the total value of the tender. In August 2020, Hyderabad-based Medha Servo Drives Ltd. won the contract for designing and manufacturing the propulsion, control and other equipment needed to make the 44 train sets. The rakes or train sets, the Railways had announced, would be manufactured at three of its production units– 24 rakes at ICF, Chennai and 10 rakes each at the RCF Kapurthala and at the Modern Coach Factory, Raebareli. On the delivery schedule of these rakes, the Railways had said that the first two prototype rakes would be delivered in 20 months (or by March-April 2022), thereafter on successful commissioning, the firm would be delivering an average of six rakes per quarter.

What is the current status of the programme?

■ Speaking to reporters after the Budget announcement, Railways Minister Ashwini Vaishnaw said that designing for version 2.0 of these trains had been completed and that testing was expected to commence from April onwards, while serial production for these rakes was likely to begin by September. On the 400 new trains, Mr. Vaishnaw said the announcement had given the Railways a target of coming out with an even better version. The design updates in the upcoming trains would focus on safety and comfort of the passengers, including reduced noise and vibration levels. The Railways is also said to be considering the use of aluminium instead of steel in the construction of the coaches as this would help make the trains much lighter thereby improving energy efficiency, and also making the trains faster.

ISIS

The Islamic State without a 'Caliphate'

The Caliphate Baghdadi established in 2014 has turned itself into an underground Islamist insurgency with branches across countries

ILLUSTRATION: R. RAJESH

STANLY JOHNY

The life and death of Abu Ibrahim al-Hashimi al-Qurayshi were similar to that of many other top commanders of the Islamic State (IS). He had served in Saddam Hussein's military in Iraq. He joined Sunni militancy after the fall of the Saddam regime in 2003. In 2007, he became a member of al-Qaeda in Iraq (AQI). In 2009, he was imprisoned in Camp Bucca, a notorious U.S.-run prison in Iraq that turned out to be a factory of radicalisation. Out of prison, he went back to the al-Qaeda fold, which was called the Islamic State of Iraq (ISI). Within the ISI, Qurayshi worked closely with Abu Bakr al-Baghdadi, the future founder leader of the Islamic State 'Caliphate' who was also an inmate of Camp Bucca. In 2019, after Baghdadi killed himself during a U.S. raid at his house in Syria's jihadist-controlled Idlib, Qurayshi, whose real name was Amir Muhammad Sa'id Abdal-Rahman al-Mawla, was appointed by the 'Shura Council' as the new leader of the IS. Twenty-seven months later, on February 3, 2022, Qurayshi blew himself up along with his family, like his predecessor, amid a U.S. raid at his residence in Idlib. The IS will now have to find a new 'caliph' to run the caliphate that no longer exists.

In Focus

- The roots of the IS can be traced to al-Qaeda in Iraq, founded by Abu Musab Zarqawi after the U.S. invasion of the country in 2003
- Under Abu Bakr al-Baghdadi, the IS captured territories across the Syrian-Iraqi border and declared an Islamic State Caliphate
- The physical Caliphate of the IS was destroyed by 2019 by different coalition forces, including the Kurdish and Shia militias, Iraqi and Syrian armies and the U.S. and Russia

The rise

The roots of the Islamic State can be traced to the ruins of Iraq. The chaos and anarchy that prevailed in Iraq after the 2003 American invasion threw open opportunities for jihadist networks in the region. Abu Musab al-Zarqawi, born in Jordan and trained in Afghanistan, laid the foundations of the AQI after the invasion. Zarqawi turned the anti-American resistance into a sectarian civil war between the minority Sunnis and the majority Shias. By 2005-06, the AQI plunged Iraq, especially the northern and central provinces, into a deadly cycle of violence.

Zarqawi, a Salafi-jihadist who set up AQI with the blessings of Osama bin Laden, was killed in an American strike in 2006, which was a body blow to his terror enterprise. Later, Iraq's Sunni tribesmen, fed up with the growing sectarian conflict and the AQI's mindless violence, set up, with support from the U.S., militia groups ('Sunni Awakening') to take on al-Qaeda. While the Awakening militias resisted the jihadists on the ground, the U.S. continued to carry out strikes targeting the AQI's leaders. Abu Ayyub al-Masri and Abu Omar al-Baghdadi, Zarqawi's successors, were killed in U.S. strikes. These setbacks substantially weakened al-Qaeda in Iraq. It was after Omar Baghdadi's death, Abu Bakr al-Baghdadi rose to the leadership of the AQI, also called the Islamic State in Iraq (ISI).

Desperately trying to revive the lost fortunes of the ISI, Baghdadi found an opportunity when a civil strife broke out in Syria in 2011. What began as anti-regime demonstrations as part of 'the Arab Spring' protests, the crisis in Syria quickly slipped into an armed conflict, with the government of President Bashar al-Assad, backed by Iran, on one side, and different armed militias, backed by Mr. Assad's regional rivals, from Turkey to Saudi Arabia, on the other. Baghdadi dispatched a group of militants, under the command of Abu Muhammad al-Joulani, across the border to set up an al-Qaeda unit in Syria. Joulani established Jabhat al-Nusra, the Syrian arm of al-Qaeda, which captured territories in the lawless, civil war-hit eastern Syria that was awash with money, weapons and militants. Baghdadi and Joulani would part ways when the former insisted that al-Nusra join the ISI to create the Islamic State of Syria and Iraq (ISIS), a new terrorist entity independent of al-Qaeda. Joulani refused to break ties with al-Qaeda and those who were loyal to Baghdadi joined ISIS, also called the Islamic State, or IS. (Joulani is now running Syria's Idlib province, the last outpost of the civil war).

The repeated military setbacks in Iraq and Syria have weakened the Islamic State organisationally, but its revivalist ideology and terrorist capability remain unbroken

Exploiting the civil war in Syria and the growing resentment among the Sunnis against the sectarian policies of the government of Prime Minister Nouri al-Maliki in Iraq, the IS, under Baghdadi's command, grew fast. It captured territories, from Raqqa in eastern Syria to Mosul, the second largest city in Iraq, straddling the borders of the two countries.

On July 4, 2014, the first Friday of the Muslim holy month Ramzan, Baghdadi, who then had a $10 million bounty on his head, appeared at the *minbar* (pulpit) of the Grand Mosque of Mosul. Dressed in a wavy black robe and wearing a black turban, he announced the establishment of a new Caliphate. He also asked for obedience from the world's Muslims as he had been "elected" as their *wali* (custodian). At its peak, the IS Caliphate had spread from Deir Ez-zor in eastern Syria to the outskirts of Baghdad, encompassing territories as large as Great Britain.

But the Caliphate would crumble within years. In Iraq and Syria, different coalitions were formed to defeat the IS. The first setback came in Kobane, a Kurdish town on the Syrian-Turkish border where Kurdish militias, backed by the U.S., defeated the IS. Palmyra, the ancient Syrian city, was recaptured from the IS by the Syrian government troops, backed by Russia. In Iraq, the national army, Iran-trained Popular Mobilisation Forces (Shia militias) and the Peshmerga (the Iraqi Kurdish militia), with help from the U.S., fought for every inch of the lost territory and reclaimed them. In 2019, the IS lost its last shred of enclave, Baghouz in Syria, to the Syrian Democratic Forces, a Kurdish militia. In the same year, Baghdadi was killed.

New model

Baghdadi introduced a new model in the global jihadist landscape. Al-Qaeda largely operated as a hit-and-run organisation. The IS built a proto-state in the name of the Caliphate and held on to its territories for years. The proto-state in Iraq and Syria became the core of the IS's operations, while the rest of the world made its periphery. The core imported recruits, radicalised Muslim youth, from across the world, and exported terror back. But when this model came under pressure with the collapse of the proto-state, the IS turned itself into an underground insurgency.

Qurayshi, Baghdadi's successor, inherited this insurgency. Unlike Baghdadi, who occasionally released audio (and rarely video) messages, Qurayshi kept a low profile. The IS became a loose confederation of many *wilayats* (provinces). In the troubled Sahel region of Africa, the Islamic State West Africa Province (ISWAP) strengthened its operations. In Afghanistan, the Islamic State Khorasan Province (ISKP) stepped up attacks after the Taliban returned to power. In Iraq and Syria, however, the IS struggled to take back territories.

A few weeks earlier, the IS carried out its biggest operation since the death of Baghdadi in Syria's al-Hasakah. It was a coordinated assault – suicide bombers struck a prison holding thousands of IS militants in Hasakah with a truck bomb and a gun battle followed, while IS inmates inside the jail revolted against the guards. It was also the most ambitious attack ordered by Qurayshi, who was personally involved in the raid, according to some reports. The raid was, however, a failure as hundreds of U.S. troops joined the Syrian Democratic Forces, the Kurdish militia, to push back the IS. In less than two weeks, came Qurayshi's death.

The Caliphate was destroyed. The Caliphs were killed. And the foot soldiers are dispersed. For a terrorist group that grew from nothing to a proto-regime controlling some of the biggest cities in the Arab world within a span of few years, this is a period of setbacks and retreat. But its revivalist ideology and terrorist capabilities, as demonstrated in Hasakah last month, remain unbroken. Also, the geopolitical conditions that allowed the IS to rise in the first place haven't changed much in Asia and Africa. When conflicts continue in Iraq, Syria, Afghanistan and West Africa, the IS or al-Qaeda would always find a way to survive the occasional setbacks.

VOLODYMYR ZELENSKY

The comedian-turned-President

Ukraine's beleaguered leader is playing down the risks of a Russian invasion

G. SAMPATH

ILLUSTRATION: J.A. PREMKUMAR

The rising tensions between Ukraine and Russia have made headlines for months. But strangely enough, the discourse around an impending invasion has mostly focused on, and ascribed agency to, non-Ukrainians – Russian President Vladimir Putin, U.S President Joe Biden, German Chancellor Olaf Scholz, and assorted EU functionaries. The conflict has been portrayed as one between Russia and the West, with Ukraine painted as a mere battleground. But now, Ukrainian President Volodymyr Zelensky (44) has come to the centre stage. Over the past fortnight, Mr. Zelensky has repeatedly asked world leaders to tone down the war rhetoric, even going to the extent of suggesting that the U.S. is creating unnecessary panic. Commenting on the Russian troop build-up of 100,000 soldiers, described by NATO Secretary General Jens Stoltenberg as "unusual", he said: "The risks have not just existed for a day, and they have not become bigger. The only thing that has become bigger is the hype around them."

While NATO and the U.S. seem to believe that Russia has enough firepower on the ground to launch an invasion in February, Mr. Zelensky believes Mr. Putin hasn't made up his mind to invade. He believes Russia's real plan is not to invade but to destabilise Ukraine internally. He has harped on how the 'panic' fomented by the West is harming Ukraine's economy, raising borrowing costs, spooking investors. The very day Mr. Biden warned that a Russian attack was imminent, Zelensky posted a video message asking everyone to "calm down". Playing down the risks of a Russian invasion is at odds with the rhetoric of his Western allies. So why is Mr. Zelensky doing it? Some analysts believe it could be from a calculation that the West might use the heightened threat perception as leverage to negotiate a deal with Moscow that Ukraine may not like but be forced to go with. At the same time, those who have tracked Mr. Zelensky's public life for long aren't overly surprised by his positions.

Mr. Zelensky was a comedian whose TV show, 'Servant of the People', revolved around a school teacher who becomes President. He rode the popularity of his comedy show to become a presidential candidate. As an outsider with no political track record or party affiliation, he ran on a plank of vague populism. His election campaign was almost entirely online – with no rallies, speeches, press conferences or travel across the country. But Ukrainians, many projecting the image of his television persona onto his political self, voted to make him President in 2019, preferring him to the incumbent Petro Poroshenko, who became identified with the corrupt oligarchic elite.

Showbiz team

As President, Mr. Zelensky, belying expectations that he would assemble a team of competent professionals to run the government, appointed members of his comedy studio to key positions. Ivan Bakanov, who used to be director of Kvartal 95, Mr. Zelensky's production company, heads Ukraine's Security Service. The head of the presidential administration, Andriy Yermak, is a movie producer. Serhiy Shefir, the chief presidential adviser, is a screenwriter.

In October 2021, notwithstanding his strident anti-corruption rhetoric, Mr. Zelensky faced embarrassing questions when his own name cropped up in the Pandora Papers as one of the beneficiaries. The network of offshore holdings closely tracked Mr. Zelensky's own loyalist network of showbiz professionals-turned- political aides.

In recent times, Mr. Zelensky has been accused of turning authoritarian. He has launched criminal proceedings against independent journalists. In February 2021, the government shut down several pro-Russia media outlets. And there is a pronounced trend of labelling critics as "pro-Russian". The U.S. and Europe, driven primarily by strategic concerns, could be overstating the democratic credentials of the Zelensky regime in an attempt to occupy the moral higher ground against the depredations of Mr. Putin. Ukraine under Mr. Zelensky, though formally democratic, remains closer to the stereotype of a former Soviet republic trapped in the oligarch-authoritarian nexus. While reading Mr. Putin's mind is notoriously difficult, Mr. Zelensky's shifting stances suggest some helpful clues may well lie in Ukraine's domestic politics.

MASOOD KHAN

Controversial diplomat

Pak.'s next envoy to the U.S. faces allegations of having 'a soft spot' for jihadists

KALLOL BHATTACHERJEE

ILLUSTRATION: SREEJITH R. KUMAR

On Saturday, the Foreign Ministry of Pakistan announced that the U.S. has accepted the appointment of the new envoy of Islamabad to Washington DC. The clearance of Masood Khan, former President of Pakistan-occupied Kashmir, has taken an unusually long time since it was first proposed by Pakistan in November 2021. The post of the Ambassador in the U.S. is usually reserved for the topmost diplomats of Pakistan that includes figures like Jamsheed Marker and Ashraf Jehangir Qazi, and the delay from the U.S. raised eyebrows. Pakistan had hinted that India was exerting influence over the State Department, causing the delay.

On Thursday, the Official Spokesperson of the Ministry of External Affairs, Arindam Bagchi described the allegation as "preposterous". The controversy, however, had a reflection in a campaign by the Foundation for India and Indian Diaspora Studies (FIIDS), a U.S.-based organisation involved in campaigning on issues that matter to India. In a statement, the FIIDS pointed out a series of factors from the past that reflected the ideological and political leanings of Mr. Khan, indicating that he harbours a "soft spot for Jihadi terrorists".

The allegation appeared relevant in the backdrop of a recent hostage crisis in a Jewish place of worship in Texas. The hostage taker had reportedly sought the release of Afiya Siddiqui, the 49-year-old Pakistani scientist, who was jailed for 86 years in 2010 for plotting the murder of American soldiers in Afghanistan. The hostage taker was killed by the law enforcement personnel but the incident brought the focus back to the Siddiqui case.

Support for Islamists

Siddiqui's release has often been sought by the radical wings among the Islamists, and the FIIDS pointed out that Mr. Khan had publicly voiced his support for her release. On May 7, 2020, as the U.S. troops were preparing to withdraw from Afghanistan as part of a deal the Trump administration signed with the Taliban, Mr. Khan had put out a tweet with a photograph of Siddiqui, and said: "The U.S. Government can find a way to free Aafia Siddiqui. Washington has negotiated a peace deal with the Taliban, once considered inveterate enemies. Room must now be created for Aafia's freedom. Long overdue. Will be a bonanza for winning hearts and minds." The FIIDS also accused Mr. Khan of having sympathy for terror outfits like Harkat-ul-Mujahideen and said he had shared a stage with Fazl-ur Rahman Khalil, the founder of HuM, which is an internationally proscribed terror outfit.

The post of the Ambassador is usually occupied by career diplomats and Masood Khan comes with both diplomatic and political experiences. He served as the President of PoK between August 2016 and August 2021, and had also served Pakistan at the UN as its Permanent Representative and as Ambassador in Beijing. He had made several controversial comments about the developments in Kashmir, especially after the abrogation of Article 370 of the Indian Constitution. PoK comprises the western part of Kashmir, which has been under Pakistani control since the conflict of 1947.

It has a self governing stature within the federation of provinces in Pakistan. Islamabad claims that PoK is "independent", though that status is not reflected within Pakistan.

Mr. Khan, as the 'President' of the region, had described the present Indian government as "fascist" and praised slain militant Burhan Wani as a hero. His appointment was also opposed by U.S. Congressman Scott Perry, who urged the Biden administration to pause the process of appointment of Mr. Khan, citing his "bona fide" soft spot for jihadist ideologies.

Campaign on Kashmir

In the past, he had been photographed with the Pakistani-American lobbyist Ghulam Nabi Fai, who has often courted controversy for his campaign on Kashmir in Washington DC. Mr. Khan is expected to take up his new assignment soon as the tenure of the current Pakistan Ambassador, Asad Majeed Khan, ends.

The Ambassador-designate's new responsibilities in Washington may include careful balancing of international concerns as the Afghanistan situation is yet to stabilise since the Taliban takeover of the country following the withdrawal of U.S. forces last year.

Road to pre-history: An aerial view of the under-construction Khavda-Khadir road in Kutch. The World Heritage Site of Dholavira is situated on the Khadir island.

Connecting Dholavira

A road under construction will open new vistas for the World Heritage Site situated on an island in Kutch

VIJAY SONEJI

Before Partition, Khadir Mahal, part of the princely State of Kutch, was known for business and livestock trade. Khadir is surrounded by the Great Rann of Kutch and the Little Rann of Kutch. Dholavira, a Harappan city situated on the island of Khadir, near the India-Pakistan International Border, came into limelight after UNESCO declared it a World Heritage Site on July 27, 2021.

The Khadir Bet (island) was known for its superior quality of Bajra, a millet, goats and berries, says Jilubha Sodha, sarpanch of Dholavira. The name Khadir comes from the word *Khad* in the Kutchi language, which means grass.

While Khavda and Khadir are just 31.9 km away from each other, as the crow flies, the lack of road connectivity till now forced the people to travel 288 km to reach each other. But after the construction of a National Highway, the distance will be bridged. Once this road comes up, traffic from Bhuj will reach Khavda and then cross over to Khadir.

"We are on the almost last stage of construction and it will take only two months to complete," says Satyandra Mishra, project manager of the site. People are eagerly waiting for the road to be officially opened as it will open the doors of the Khadir Bet and increase the brotherhood between Hindu Khadir and Muslim Khavda, says Mahadev Barad, a young local social worker.

Dholavira and a fossil park are now the pride of the island, but the Bhajdo Hill and the Meruda Takkar Hill are yet to become famous.

On the edge: Boys stand near the last pillar of Kadhvandh village on the Khavda side after which the area falls under the Great Rann.

Short cut: A herd of cows cross the road under construction.

Geographic landmark: The Tropic of Cancer line on the Khavda side of the new road.

Alive history: The Harappan site of Dholavira in Khadir.

Early life: A Brachiosaurus model at the fossil park in Dholavira.

Photo point: Photographers have made the area around Khadir a spot for pre-wedding shoots.

Before time: Private transport plies on the yet-to-be-completed road.

Desert cuisine: A woman in Khadir making rotis from flour of Bajra, which the island is famous for.

THE SUNDAY PROFILE

A new beat

As the top ED officer at the helm of some of the most high-profile cases, from the Aircel-Maxis deal to 2G, Rajeshwar Singh was known to be a good officer, a natural leader, and someone with friends across divides. Will these traits see him through his new role, as the BJP's poll candidate in UP? DEEPTIMAN TIWARY profiles the 48-yr-old

Illustration: Suvajit Dey

MINUTES AFTER former Enforcement Directorate (ED) Joint Director Rajeshwar Singh announced on January 31 that he was taking the political plunge after his voluntary retirement from the agency, a montage video of Singh went online. In the video, Singh is seen praying to Lord Shiva, walking in a park in slow motion, reading a newspaper and engaged in an intense discussion — all this while the score of S S Rajamauli's brawny epic *Bahubali* plays in the background. The video was retweeted by his sister Abha Singh with the comment: "Here comes #Rajeshwar Singh ex ED".

This unmistakable strongman image has often been associated with Singh's career — be it during his stint with the Uttar Pradesh Police or the country's premier anti-money-laundering agency.

In his decade-long career as a police officer in UP — from 1997 to 2007 — Singh, now 48, cracked down on mafia gangs in Lucknow and Allahabad, with the high point of his career being the arrest of strongman Atiq Ahmed. A recipient of the police medal for gallantry, Singh has close to two dozen encounters to his name — this, many would argue, sits at odds with his law degree and doctorate in human rights from Delhi University.

An alumnus of IIT, Dhanbad, Singh operated in the ED — which he joined in 2007 as an assistant director — with no less swagger. From the Madhu Koda case to the Sahara case, from 2G scam to the 2010 Commonwealth Games case, from the Y S Jagan Mohan Reddy case to the coal scam cases, Singh probed almost all the high-profile cases of the UPA era, involving politicians of the then ruling dispensation.

Singh's nomination as the BJP candidate from the key Sarojini Nagar constituency in Lucknow comes at a time when the ED is accused of going after Opposition politicians. While there have been instances of CBI directors becoming governors after retirement or entering politics, Singh's decision to join the BJP raises questions of propriety, given that he was a serving officer of a central agency and quit to join electoral politics.

Questions have also been raised over the allegedly political nature of the ED's investigations, with their tardy progress and poor conviction record. While its first conviction came in the Madhu Koda case, more than 10 years after the ED began probing money laundering cases, its marquee 2G scam probe resulted in acquittal of all the accused.

The most important case of Rajeshwar's career was the 2012 Aircel-Maxis deal, in which the accused include then finance minister and senior Congress leader P Chidambaram. As the regime changed in 2014, he probed a series of cases — from the INX Media deal to irregularities in the Rajasthan ambulance scheme and investments in Vasan Healthcare — where either Chidambaram or his son Karti was named. Chidambaram sent time in detention over it.

Sources said this would not have gone unnoticed by the top BJP leadership, which holds Chidambaram responsible, as Home Minister, for probe into the encounter killings in Gujarat that saw the arrest of Amit Shah.

More recently, as head of the Lucknow Zone in the ED, Singh led the investigation against Gayatri Prajapati, a Samajwadi Party leader and mining minister in the previous Akhilesh Yadav government, in a case of alleged money laundering and illegal mining.

Singh's former colleagues in the agency talk of him as a sharp and meticulous officer.

"He is intelligent and very hardworking, with a deep understanding of cases and, above all, takes bold decisions," says former ED Director Karnal Singh, who supervised Singh's probe into the Aircel-Maxis and INX Media cases, among others.

"We were always a step ahead in every case. Before an accused could make a move, we were prepared for the court. During interrogations, Singh could surprise even the most well-prepared suspect with evidence," said former ED deputy director Kamal Singh, who had worked with Singh since the days of the 2G scam case.

Another close colleague, retired deputy director Satyendra Singh, remembers him as a "true leader" to his subordinates. "Despite his commanding presence in the agency, he was always warm, even in adverse situations. Once, some sensitive details of the 2G case got leaked to the media and the superiors were very angry. He shielded all of us by taking full responsibility and asked for action to be taken against him," Satyendra Singh said.

> "He has friends everywhere, be it in ministries, legal fraternity and every political party. I wouldn't have been surprised if, had there been a Congress government, he got a ticket from the Congress," said a senior IPS officer

However, beyond his qualities as an officer, Singh's rise was also shaped by his ability to work the power circles. His critics say he found a "guardian angel" in every political dispensation. There was a time when he top Congress politicians attended his parties.

"He has friends everywhere, be it in the ministries, the central agencies or the legal fraternity. He could also move with ease across the political spectrum. I wouldn't have been surprised if, had there been a Congress government at the Centre, he got a ticket from the Congress," said a senior IPS officer who didn't want to be identified.

Born in Lucknow, Singh belongs to a family of civil servants. His father Ran Bahadur Singh, who rose from being a UP Police service officer to an IPS within a span of 12 years, eventually retired as DIG of the state capital.

Singh's wife Laxmi Singh is an IPS officer currently posted as IG, Lucknow. Meenakshi Singh, one of his two sisters, is an Indian Revenue Service (IRS) officer married to UP-cadre IPS officer Rajiv Krishna, who is currently posted as ADG, Agra. His other sister, Abha Singh, an Indian Postal Service officer-turned-lawyer, is married to Maharashtra cadre IPS-turned-lawyer Y P Singh. His brother Rameshwar Singh, also an IRS officer, is currently an Income Tax commissioner.

Throughout his 14-year ED career, Singh had top lawyers such as Prashant Bhushan, Harish Salve and BJP MP Subramanian Swamy arguing in court to procure protection for him against allegations of malpractice or disproportionate assets.

In 2011, at the peak of the 2G probe, when allegations were made against Singh by the Sahara Group, a Supreme Court Bench of Justices G S Singhvi and A K Ganguly not only issued contempt notice against the group but also provided Singh protection from slander.

According to sources, during the 2014 general elections, Singh had been considered by the BJP as a potential candidate for Amroha, but things had not worked out.

In 2017, too, when allegations were made against Singh to then Revenue Secretary Hasmukh Adhia, a Bench headed by Justice J Chelameswar gave blanket protection to Singh against any investigation.

Another testimony of this goodwill is an episode from 2014 when government counsel K K Venugopal went against the Centre's move to repatriate Singh back to UP, arguing that it could not be done as the officer was probing the 2G and Aircel-Maxis cases.

Singh had won an order for permanent absorption in the ED from the Central Administrative Tribunal (CAT) in December 2013 but the government was unwilling to absorb him, even after the regime changed in May 2014. After the matter went to the SC and following Venugopal's argument, a Bench of Justices H L Dattu and S A Bobde gave the government three days to absorb Singh into the ED.

By his own account, Singh had been accused by Adhia of "manipulating the judiciary, especially the Supreme Court", which Singh said was "strange" and "unbelievable", wondering if "so many judges could be manipulated over such a long period of time".

This was part of a letter that Singh wrote to Adhia at the peak of the 2018 battle within the CBI, accusing him of "siding with scamsters and their affiliates".

The 2018 tug of war between then CBI director Alok Verma and then special director Rakesh Asthana was the first major controversy that had Singh in its crosshairs. In this battle that forced the Prime Minister's Office to intervene and push both officers out of the agency, Singh was rumoured to have been siding with Alok Verma.

It saw a fresh complaint being filed before the Supreme Court against Singh with the Finance Ministry submitting a report that Singh received a call from Dubai. Though the allegation was rubbished by then ED Director Karnal Singh, the SC, for the first time, removed the protection granted to him and the government instituted a probe.

According to an investigation by *The Wire*, this was also the time when Singh and his family were listed as potential targets of the Pegasus spyware.

"Yet, the government accepted his VRS request and the ruling party has given him a ticket. And for that, Rajeshwar hasn't had to work out outrageous cases in anticipatory obedience. That itself tells you that he was always bigger than his job," said the IPS officer who spoke on condition of anonymity.

TAKE 5
PORTERS

KRANTHIVEERA SANGOLLI
RAYANNA RAILWAY STATION, BENGALURU

"280 of us, after queuing for a day, often we earn nothing"

'Not just us, destitutes rest here... We don't ask their religion'

Last week, right-wing Hindu activists barged into a room for porters at the railway station alleging Muslims were using it as a prayer room. The porters denied this, but South Western Railways later "cleared" the portion being used for namaz. Afraid of identifying themselves for losing their jobs, the porters talk about the row:

KIRAN PARASHAR

1 How did the row start?
Religious practices are not our problem but livelihood. We wanted the media to highlight our plight before the Budget, instead there was an entirely unnecessary controversy...

2 Who complained?
None of us complained. We live in harmony. All we care about is earning our bread and butter. Some miscreants created this nuisance. We celebrate Annamma festival, Ayyappa festival, observe Gyarvi Sharif together. Muslim porters joined Hindus to protest a Railway plan to demolish a temple for an escalator. We together saved it.

3 Did you try opposing changes to the room?
We were scared for our jobs. We had no choice but to listen to the officials... It's not just a room for porters, often people who are abandoned take shelter there. Nobody asks their religion.

4 What issues should the government address?
There was a time when we earned good money. But then came luggage bags with wheels and escalators, we took a massive hit. As long as there was a separate Railway Budget, we hoped things would change. But now, there is not even hope.

5 Do you have a union?
There are about 280 of us at this railway station and we have two unions. We come in two shifts, divide spots at the front and back gates, to prevent crowding... There are days we go back home with no money. On best days, like in April and May, we earn up to Rs 500 a day.

india 75

NUMBER PLATE
16,829

The number of foreign tourist arrivals in India in 1951, according to the India Tourism Statistics, a publication of the Union Ministry of Tourism

27,44,766
The number of foreign tourists arriving in India in 2020. This number was 10.93 million in 2019 before the Covid-19 outbreak

$6,958 million
Estimated Foreign Exchange Earnings from tourism in India during 2020. This figure was $30,058 million in 2019 during pre-Covid times. It recorded a decline of 74% during 2020, when the pandemic hit the world

5,49,273
The number of foreign tourists from Bangladesh, the highest, followed by the United States (3,94,092) and the United Kingdom (2,91,874)

HARIKISHAN SHARMA

Neither hair nor there

Bengal accounts for almost half of India's hair exports, sustained by workshops run out of homes. Centre's recent export curbs have come as a further blow to this cottage industry, struggling since lockdown

RAVIK BHATTACHARYA & ATRI MITRA

A LETTER FROM
ULUBERIA, HOWARH
WEST BENGAL

Sabir Ali at his workshop. The family has been in the business for 50 yrs. *Partha Paul*

SAHABUDDIN MULLICK, 46, sits near the door of a 12 foot by 10 ft room, comb in hand, brushing the strands of hair atop a wooden bust. Others in the room are weaving hair into a patch of cloth to make a wig.

"Lockdown was a nightmare. Business is yet to pick up, and then there are the touts and middlemen. Our entire village thrives on processing human hair, but there is no government support," says Mullick, who has been in the business for 25 years and employs about 20 youths in the workshop he runs out of his home in Mullickpole village in Howarh, about 60 km from Kolkata.

Now has come another blow. On January 25, the Centre imposed restrictions on exports, on the demand of the hair industry, to check smuggling. Now an exporter needs a permission or licence from the Directorate General of Foreign Trade.

Welcoming the Centre's move, Human Hair and Hair Products Manufacturers and Exporters Association of India's Sunil Eamani told PTI that unchecked smuggling was hurting local industries and exports.

During April-November this fiscal, hair exports stood at USD 144.26 million, a huge jump from USD 15.28 million in 2020-21. West Bengal is among the highest contributors to this, with some estimates putting its share at more than 50% of the exports.

And the hub of the trade are the districts of Howrah, Murshidabad, Malda and Purba Medinipur, where processing of human hair is a cottage industry. The Centre's new rules, these traders fear, may mean monopoly for a handful of exporters with licences, further cutting their dwindling profits.

Mullick procures raw hair and, after processing, sells it to middlemen, who in turn sell it to exporters. "I used to sell 200 packets of processed human hair per month (each packet is around 1 kg). My unit shut down for a year following the 2020 lockdown and I had to take loans to retain my workers. Now my sales are down to 20 packets a month."

The routine involves agents collecting or buying hair from households and temples, and bringing them to the workshops. Many women in these parts save hair they shed while combing, and every four-five months, an agent buys it off them. Hair donated in temples in the south also makes its way here.

Depending on quality, hair can sell from Rs 500 to up to Rs 5,000 per kg. The price varies as per length. A kilogram of 50-inch good human hair can sell for about Rs 90,000 to Rs 1.10 lakh. It's the processing that makes the difference, with processed hair selling for nearly double the rate for regular hair.

Processing involves untangling the hair, shampooing it and sometimes dying it. Then it is stored (in wooden boxes with iron nails), pulled constantly for hours for further untangling and smoothness. Village households also do the untangling, for a price.

Shuvendu Dolui, 19, has been working with Mullick for five years. With an expert's ease, he points out the "50 types of wooden busts, for different head shapes" for wigs.

Depending on their skills, workers get paid between Rs 2,000 and Rs 18,000 a month, for 10 hours of work a day.

Sheikh Saifuddin Ali, 52, says the middlemen from big cities like Kolkata, Delhi and Mumbai are a necessary evil. "How can exporters come to villages? And we don't have the infrastructure to export on our own."

One unit here though has had its brush with big time, having supplied wigs and hair pieces for Bollywood and Tollywood as well as the TV industry. Sheikh Ali Hossain, 70, started his business 50 years ago with his father. "We then collected hair from middlemen, processed it and made wigs... I have personally travelled with Bengali film stars like Biswajit Chatterjee and Soumitra Chatterjee.

Hossain's sons Sabir Ali and Sekender Ali have now taken up the business. Sabir says they built a workshop in Mumbai but it had to be shut due to labour problems. Sekender has ventured into exports. "Small exporters like us follow all the rules. Banks and Customs are involved. But this new policy of the Centre will only help the big exporters with huge working capital," he says.

At Kulai Sheikh Para, about 15 km from Mullickpole, Sheikh Akhtar Hossain, 46, whose workshop deals in synthetic hair, says, "We supply to states like Delhi, Gujarat, Mumbai and Odisha, where the hair pieces are used in plays performed in villages."

The lockdown hit them too, says Hossain. First, he couldn't travel. Then, "at many places night curfew is on and therefore rural plays and theatres have closed down".

He hopes the government builds a hub near a city such as Kolkata exclusively for hair. "It will enable us to directly sell to exporters."

Kolkata-based exporter Sumanta Chakraborty agrees smuggling of hair to Bangladesh and China is an issue. "So, a proper policy was needed. 'Raw hair' is in more demand and leaves the country fast."

MSME Minister Chandranath Sinha says small exporters had approached them. "They are in crisis after the Centre decided to include raw hair in the export list. We are monitoring the situation."

Across THE AISLE

P CHIDAMBARAM
Website: pchidambaram.in
Twitter @Pchidambaram_IN

No work, no welfare, only wealth

The Budget's messages are no cash transfers or free rations to the very poor; no increase in social security pensions; no interventions to combat malnutrition, stunting and wasting; no intervention to overcome the huge 'learning loss' among school children in the last two years; no tax relief to the middle class; and no GST relief to consumers. My conclusion: welfare has been thrown to the wind

SINCE I came out of the Utopian dream of socialism, I have believed in three driving forces to build a progressive, prosperous and plural nation: **Work, Welfare and Wealth**. None of the three is less or more important than the other two.

The context will, of course, vary. In the last 30 years, we have seen dramatically different economic contexts in 1991 (near default), 1997 (globalization), 2002-03 (drought), 2005-08 (global upswing), 2008 (international financial crisis), 2012-13 (taper tantrum), 2016-17 (demonetization, drought) and 2020-22 (pandemic, recession). Each context will require a different and nuanced response, especially while presenting the Budget, but the basic philosophy of promoting work, welfare and wealth ought not to change.

Why Work?

The *Homo sapiens* are no longer only hunters and gatherers of food. As his/her desires and needs increased, he/she embraced the culture of work. In the modern era, work is an integral part of life. In a developing economy, an important indicator is the number of persons aged 15 years and above who constitute the workforce. In the workforce, the LFPR (Labour Force Participation Rate) is the proportion of the population that is presently employed or seeking employment. In India the current numbers are workforce: 94 crore, LFPR: 37.5 per cent, equal to 52 crore (*source: Economic Survey, Appendix*).

The gravest economic challenge facing India — a young nation where the median age is 28.43 years — is unemployment. Mr Narendra Modi understood this when he bid for power but, over the years, his philosophy seems to have changed. His promise to create 2 crore jobs a year had electrified the youth. Later, he said that selling *pakoras* was also a job! In the last seven years, unemployment has increased. The pandemic and the lockdown brought in their wake more unemployment. 60 lakh MSMEs were closed down. Millions lost their jobs, that included salaried jobs and non-regular jobs. The self-employed (e.g. tailor, electrician, plumber) lost work. Many of those jobs have not come back. The current unemployment rates are Urban: 8 per cent, Rural: 6 per cent.

Besides, those who returned to work faced wage cuts. In the last two years, 84 per cent of households have suffered a loss of income. In this background, the Budget has promised that 60 lakh jobs will be created in the next five years. As against the 12 lakh new jobs a year, the number of persons who enter the workforce every year is 47.5 lakh (*source: Labour Bureau*). My conclusion: unemployment will rise, especially among the less educated.

Why Welfare?

Welfare is a wide concept that includes many aspects such as livelihood, job, food, healthcare, education, social security, rest & recreation, etc. Welfare measures are intended to address these challenges. For example, MGNREGA is intended to address the challenge of livelihood, National Food Security Act to address the challenge of food, free public health facilities and health insurance to address the challenge of healthcare, Right to Education Act to address the challenge of education and so on. What has the Budget done? Look at the allocations:

Subsidy/ Allocation for	2021-22	2022-23 (in Rs crore)
Petroleum	6,517	5,813
Fertiliser	1,40,000	1,05,000
Food	2,86,219	2,06,481
Mid-day Meal scheme	11,500	10,233
Crop Insurance	15,989	15,500
MGNREGA	98,000	73,300
Health	85,915	86,606

The total subsidy bill has been cut by a humongous 27 per cent!

The Budget's messages are no cash transfers or free rations to the very poor; no increase in social security pensions; no interventions to combat malnutrition, stunting and wasting; no intervention to overcome the huge 'learning loss' among school children in the last two years; no tax relief to the middle class; and no GST relief to consumers. My conclusion: welfare has been thrown to the wind.

Why Wealth?

I support the creation of wealth. Wealth is the source of new capital and, consequently, new investment. Rising incomes, after taxes, will result in accumulation of wealth. Both income and wealth are triggers for investment, risk-taking, innovation, R&D, charity and other uses. My opposition is not to the creation of wealth but to the accumulation of wealth that widens inequalities in society. India, according to some studies, is one of the most unequal countries in the world. A Budget that is constructed on capital-intensive investment, advanced science and technology, digitization and sophisticated ecosystems to the *exclusion* of capital, technology and labour that are required to sustain the lives and livelihoods of millions of poor people is a mockery of the poor. If more resources are needed to help the poor, the correct approach will be to tap the wealth of the rich — *the very, very, rich in India are 142 persons whose wealth is Rs 53,00,000 crore* — and use the resources for programmes and interventions to help the poor. My conclusion: this Budget is a capitalist budget that has ignored the poor.

The on-going debate in the media and in Parliament has exposed the deep divide between the privileged sections and the deprived sections. The capital market may salute this Budget but the poor and middle classes will not forgive the makers of this Budget.

Fifth COLUMN

TAVLEEN SINGH
Twitter @tavleen_singh

Rahul Gandhi's delusions

AS I listened to Rahul Gandhi's speech in Parliament last week, I found myself understanding anew why Narendra Modi has won two terms in office. And understanding anew why I was once such a supporter of Modi that I continue to be charged daily by someone or other on Twitter of being a 'fascist enabler'. Before going any further, let me make clear that I believe Modi has done some things that are truly admirable. Swachh Bharat and his government's programme that aims to provide drinking water to every Indian home are on top of my list.

In my view it was the efficiency that he brought to rural welfare programmes in general that won him a second term. Since then though there has been too much Hindutva, too many hate speeches, too much religiosity and too much disdain for dissident opinions, for me to continue being a '*bhakt*'. At heart I am a liberal and a proud member of the Khan Market gang and cannot abide people whose politics is based on spreading hatred between communities or castes. So, I am not only no longer a '*bhakt*' but a critic and a dissident.

There is a great deal that is dangerous and dishonest about Modi's Bharatiya Janata Party. But, to listen to Rahul Gandhi's long and rambling speech in the Lok Sabha was to realise that if he remains the only challenger that the Congress party produces, Modi will continue to look much, much better. A recent *India Today* poll found that when it came to choosing a Prime Minister, the people polled put Modi at the top and Rahul at a really low number two.

The Dynasty's crown prince has learned nothing from two humiliating defeats in general elections and seven years of being in the Opposition. The most important thing that he has not learned is that it is not his birthright to rule India, and the sooner he sheds his air of entitlement, the better it will be for him. He charged Modi with behaving like an Emperor, instead of like a democratically elected leader, but seems to have forgotten that his grandma once allowed the President of the Congress party to announce that 'India is Indira and Indira is India'. More recently I happened to be present in the audience when his mother declared grandly, just months before the last general election, that Modi would not be coming back. 'We will not allow him to.'

He seems to have forgotten that when his mother was India's de facto prime minister, she was so powerful that she could order the man who was technically India's Prime Minister to send top secret government files to her residence for inspection. So powerful that her kitchen cabinet made policies that the Government of India was ordered to implement. So powerful that she could include her son-in-law in a list of VVIP officials who did not need to be frisked or metal-detected at airports. It was power without accountability on a sickening scale, and it became one of the reasons for the rise and rise of Modi. And, even when it was clear to most Indians that Modi would become Prime Minister, it was still possible for one of Sonia Gandhi's courtiers to publicly proclaim that the only job Modi was fit for was to make tea in the Congress party's office.

Rahul Gandhi made serious mistakes when analysing foreign policy in his speech, but that bothered me less than his saying that under Modi, India has been divided into two countries. One India is inhabited by the rich and the other India that is inhabited by the poor. His political homework is so deficient that he seems not to know that this division has existed for the 75 years that India has been an independent nation. The divisions in Nehruvian socialist times were so pronounced that those who inhabited the India in which the ruling class lives could not have cared less that in the other India there were people who did not have access to such basic things as clean water. In that exalted India inhabited by high officials and mighty political leaders was where policies were made. The disdain for the other half was so obvious that they could not have cared less about the abysmal quality of the public goods these policies created. They did not need to because their own children went to private schools, and nobody needed to use the medical services provided in filthy government hospitals.

If Modi has not been able to make much difference to the dreadful socialist legacy that he inherited, he cannot be blamed for not trying. The Budget that was presented in Parliament the day before Rahul Gandhi made his speech was defined by the emphasis it placed on building infrastructure and creating an India in which every Indian home will have clean, running water, a toilet built with government assistance and subsidised cooking gas. Modi may not succeed in achieving all these things but there is no question that he is trying to give ordinary Indians a chance to have something resembling a standard of living.

So, before Rahul makes his next speech in the Lok Sabha, he would do well to do some homework and take some elementary history lessons. If he does, he may discover why Modi remains popular despite his many failings.

The symbolism of inter-caste marriages

Dalitality

SURAJ YENGDE
Twitter @Surajyengde

SURROUNDING THE anti-caste movement, a topic remains hotly contested. It is about inter-caste marriages as a way towards the annihilation of caste. Activists, thinkers and leaders are divided over this. Dr Ambedkar's famous quote from *Annihilation of Caste*, wherein he stated that inter-caste marriages were "the real remedy for breaking caste", is often cited. Ambedkar thought "fusion of blood" would create the feeling of kith and kin.

Ambedkar's advice remains unheard. The Indian Human Development Survey reported that 95% of Indians still find partners within their subcastes. What is the situation of the rest 5%, who have braved the odds against tradition and caste? There isn't data or satisfying coverage of them.

Many a time second- or third-generation educated Dalits who have managed to access quality education, and landed respectable (elite) jobs, find the prospects of marriage outside caste available to them. What then happens to their inter-caste marriages? Their union is unlike any other marriage. It is a political act — an achievement of love over caste. The Dalit person marrying outside caste, say to an upper caste, finds himself or herself duelling between the struggle of their community, and the culture of their spouses and in-laws. It's akin to getting a good job in a company surrounded by oppressor castes. Rarely does one get a chance to balance both, and what is the outcome if they do?

The children of mixed-caste parents also grow up amidst profound misunderstanding of their complicated backgrounds. They are brought up in a caste-neutral or a-caste environment, which essentially means being subjected to the dominant caste parent's identity. The closest they come to caste is while availing caste reservations or visiting their Dalit family. If they align themselves with the identity of the oppressed caste parent, which is need-based, they risk a backlash.

The Government of India launched a scheme in 2013 to encourage inter-caste marriages. It offers Rs 2.5 lakh if one of the partners is a Dalit. One of the requirements is a recommendation from a sitting MLA / MP and government officer concerned. The scheme wants to appreciate and promote the "socially bold step" of the couple. When countries worldwide are now integrating rapidly across color, racial, ethnic boundaries, the Indian government has to offer incentives for couples to marry outside rigid boundaries.

Does inter-caste marriage then result in the anticipated social change and abolish untouchability?

I can share my experiences. Of a *savarna* woman in the US who married a Dalit man and joined the Dalit community's network. Often, during interactions, the *savarna* woman wouldn't parse her background. The Dalit community's culture, religion and festivals were different from hers. Unknowingly, the *savarna* woman would privilege her experiences. At some point, she forgot about her caste identity and started to claim Dalit identity passively. Since she was a student and an activist, she profited from the networks offered by her Dalit compatriots.

As she became more comfortable with the Dalit community, she began to take over leadership roles. She started to call out the Dalit leadership for their overrepresentation of males. Within a matter of a few months, she was representing Dalits at conferences and seminars.

What we see from the above anecdote is that the notion of inter-caste marriage has become a passport for those who have lived the life of oppressing Dalits directly or by virtue of their participation in anti-Dalit prejudices, to now suddenly assume the position of misrepresenting Dalits.

The second case is of a Dalit minister married to a Brahmin woman, who was asked about it on a Marathi talk show. He replied that it was because "Brahmin women are very good", and appealed to all Dalit men to marry Brahmin women.

Coming back to Ambedkar's speech quoted above, he further suggested that to break the caste system, it was pertinent to destroy religious notions, the sanctity of the Shastras on which caste was founded and not occasionally bring about "inter-caste dinner and inter-caste marriages, which were futile methods of achieving their ends".

What Ambedkar is arguing is not against inter-caste marriage, but he is inviting us to go deeper, beyond social sanctions. He wants us to be participants in movements that would upend and eventually change mindsets.

Suraj Yengde, author of Caste Matters, *curates the fortnightly 'Dalitality' column*

life & WORK

NASEERUDDIN SHAH

Playing Nathuram Godse: Censor as sensibility

No Indian can condone Gandhi's killing, but don't judge a film without watching

IN COLLEGE I read a book, *The Man who killed Lincoln*, and I can still sharply recall how electrified I was by the description of the travails of John Wilkes Booth, who after shooting Abraham Lincoln escaped from the Ford theatre, breaking his leg, and for a while managing to evade a man-hunt until he was surrounded and killed in a burning barn, though evidently it was never confirmed that the charred body was his.

The seed of wanting to become an actor had germinated fully in me by then and I remember dreaming of someday playing Booth — I'd study pictures of the man and wonder if I could pass off as him; the role seemed to be one which I, or any actor, would devour with great relish. Everyone had heard about the humanity of Lincoln, and in no way did I identify with Booth and his beliefs, but I felt a strong empathy for the man. I thought it was greatly dramatic and would give me a chance to display all my acting wares.

But those were the dreams of a 17-year-old, would-be actor. Had I been American, I might have thought differently. Gary Oldman, who is actually British, certainly didn't get dragged over the coals for playing Lee Harvey Oswald. I have no idea what his actual feelings about the killing of John F Kennedy were, but he obviously felt no pangs of guilt about playing Oswald, or playing it sympathetically.

Amol Kolhe of the NCP, however, is a politician and should really have thought several times before agreeing to play Nathuram Godse, because I guess a politician's first duty ought to be to the impression his party wants to project. I don't know if deep down he, or the filmmaker/writer, consider Godse's act heroic or not, but they should have known that Kolhe's party doesn't, or at least wants to give that impression. I suppose he decided to play the part either because it would be a challenge or because he genuinely felt that Godse's point of view ought to be heard, and I see nothing wrong with either motivation.

I am truly at a loss to understand what this outrage, over a film no one seems to have yet seen, is all about. It needs to be viewed before it is judged, and those who find its arguments unacceptable should know only too well the futility of trying to engage with unreasonable convictions. But since the '70s this cancel culture has become a malaise; its main symptom is a tendency to condemn a thing without knowing fully about it and is illustrated in examples aplenty: the attempted embargo on the brilliant play *Ghashiram Kotwal*, the *Kissa Kursi Ka* episode, or the banning of *Satanic Verses* suggested by Salman Khurshid, who at that time hadn't read the book. You can't beat that for irony!

But if the majority of people who see *Why I Killed Gandhi* are offended, Kolhe will have to own up to the responsibility of having helped glorify someone who committed one of the most heinous acts in the history of modern India. He should not forget the fate of Leni Reifenstahl, who after making two cinematically brilliant documentaries extolling Hitler's greatness, had to seek refuge in Switzerland.

Or the case of the great conductor of the Berlin Philharmonic (and Hitler's favourite conductor) Wilhelm Furtwangler who, perhaps under the illusion that Hitler would win, did not leave Germany. After Hitler's humiliation, Furtwangler of course maintained that he didn't agree with the Nazis, but about whom a writer said, "...he chose the wrong side, living at arm's length with the Nazis and holding his nose".

I refuse to believe that any true-blue Indian, leaning however far to the right, with the slightest awareness of a man called M K Gandhi, would celebrate his murder. This insistence by certain respected undertrials that Godse was a patriot has to ring hollow, and of course we will never forgive such politicians "in our hearts", though we may do so in our actions!

I have not seen Kolhe perform or speak, but in a scenario where the Prime Minister's own venomous rabble-rousing passes as great oratory and a deeply patriotic foreign national wins a revered Indian acting award for playing a Naval officer with a moustache, I wouldn't be surprised if Kolhe is considered good at both.

I am pretty sure I would not accept a part that went against my beliefs and I don't mean religious beliefs. Incidentally I don't remember the excrement hitting the air-conditioner to such an extent among Indian Muslims when Nawazuddin Siddiqui played Bal Thackeray, or among the countless reasonable Hindus in our country when he was denied the chance to act in the Ram-Leela in his hometown. I don't know how much flak he had to face from Muslims!

I do know however that I have to live almost daily with hate messages calling me a Pakistani agent because I played one in a film, as if by playing him I approve of his activities. I know for a fact that Pran, after 50 years of personifying evil, never received letters telling him how despicable he was and that he better pack his bags and leave.

I am reminded of a cartoon by the master R K Laxman, in which two *dhoti*-clad Gandhi *topi*-wearing guys are exiting a theatre showing the film *Gandhi*. One says to the other, "Truly remarkable man... this Ben Kingsley". The need to identify with all the characters, and not just with the hero in a movie, is the opium that draws hordes into movie theatre. They identify with everyone and when they see a character do something they themselves would be ashamed to admit doing, they squirm, but applaud doings that make them bask in reflected glory — though it's a little disturbing to witness the content they have begun to applaud of late.

I really think we should hold our judgment on *Why I Killed Gandhi* till the film comes out, though I have to confess I am not greatly optimistic that it will talk sense.

The writer is an actor, director and 'occasional writer'

On the LOOSE

LEHER KALA
leherkala@gmail.com

Keep calm and Wordle on

EVERYONE I know is obsessing about Wordle these days. For the uninitiated, in this Internet game, players have to guess a predetermined five-letter word on a grid of green, yellow, black and white boxes. It's the letter equivalent of Sudoku, easy enough to beguile a preteen and tough enough to fox a middle-ager. As any economist knows, sought-after luxury items are a function of scarcity — the shrewd Wordle developer releases just one game a day, ensuring a hooked audience is anxiously waiting for it to drop.

Would Wordle be such a hit if the world wasn't in the grips of serious existential boredom? Probably not. Lately, life had reverted back to the lonely cycle of lockdowns and curfews, forcing us to rely on blinking gadgets and aimless scrolling. Play is essential for child development but what's not acknowledged enough is that games are crucial for adults as well who need something to distract themselves from the harsh realities of their lives. Look no further than the enduring popularity of Crossword and Word Search. Putting in the effort to solve a puzzle, watching the letters flip to green provides a jolt of welcome satisfaction, at any age. On days when tedium feels overwhelming, these little victories see us through. A game like Wordle provides exactly that.

Enthusiasm is a hallmark of youth and one of the biggest challenges of ageing is finding something to be excited about. Unfortunately, the messaging we internalize in our careers is that when faced with high-pressure situations, the only acceptable outcome is to succeed brilliantly or not participate at all. There is a ridiculous premium on perfectionism than experience. It explains why the other bane of middle age, diets, is destined to fail. No normal human being, however determined to undertake a dogged slog, can stick to long spells of denial. If we used the Wordle approach — tough, not too tough — to other areas of our lives, we would be far more at peace. Instead, people are subconsciously divided into two categories, geniuses and workaholics; there is no space for people content with moving the ball just slightly ahead every day.

It is perhaps the lot of humanity that we dreamily imagine success as something transformative and beautiful. Like watching Rafael Nadal script history in an epic five-set match, to win the Australian Open. We are awestruck at his performance, not the process behind the creation of Nadal. The finished product is impressive indeed, but to get there involved unending practice and many painful hours of strengthening exercises. Such big wins are rare and only a chosen few experience them. Yet, in all our lives, there are many minor milestones worth striving for, which can recreate (albeit, smaller) Nadal-like thrills; like cooking a nice meal or exercising. We underestimate the value of incremental improvements, our preferred target being major breakthroughs, the kinds we watch in the Olympics and the Oscars.

Home-bound and bored, a lot of us rediscovered boardgames and old-fashioned entertainment in general, thanks to the pandemic. Monopoly reported a 21% jump in sales in 2020 and 21, clearly because people were looking for ways to spend their hours. A lot of my friends started learning bridge, enjoying the happy state of full absorption in a leisure activity, usually denied to adults too caught up with work. Personally, I rediscovered Scrabble. There is a presumption that someone who reads and writes for a living will be good at it, but actually the opposite is true. I am routinely thrashed by a far less articulate friend who uses 'Q' and 'X' exasperatingly well.

Losing, however, doesn't diminish the joy I derive from Scrabble; I am optimistic the small tweaks I am making can turn the tide of the game.

The writer is director, Hutkay Films

THE SUNDAY EXPRESS MAGAZINE

eye

POINT OF VIEW

Poetic Engineering

Preserving a structure like the Rashtrapati Bhavan requires innovative finesse and a capacity to hold heritage with sensitive gloves

BOOKS

- Review of Ritu Menon's *Zohra!*
- Review of Meeta and Rajivlochan's *Making India Great Again*
- Review of Shrayana Bhattacharya's *Desperately Seeking Shah Rukh*

A Raga for Every Thought

EXPRESS ARCHIVES

Hindustani classical vocalist Prabha Atre, 90, who was awarded the Padma Vibhushan last month, continues to challenge ideologies of a rigid system and make classical music approachable to all

Suanshu Khurana

PHOTO COURTESY PRABHA ATRE

NOTES TO HERSELF

(Top) Prabha Atre has never failed to question tradition even as she nurtures it; with her guru Hirabai Barodekar

OVER THE last 15 years, Hindustani classical vocalist Prabha Atre has headlined the Sawai Gandharva Bhimsen Mahotsav — a significant event in the country's cultural calendar. Initiated by Pt Bhimsen Joshi in memory of his *guru*, the annual Pune festival draws large crowds, who travel from far and wide, some even sleeping outside the ticket counter for festival passes in the morning. Until he retired in 2006, Joshi would close the festival. He then chose Atre, who has carried it forward even after his passing in 2011.

This year, the festival — Joshi's birth centenary year — stands cancelled due to the pandemic. In its place, there will be Abhivadan — a three-day festival that honours the Kirana *gharana* doyen. Atre will be its main act.

At home in Shivajinagar, Pune, Atre, one of the seniormost performing artistes in the country, continues to do what she has for the last 70 years — wake up at dawn to discover the secrets of the *swaras* (notes). "There is no other way to hone your art, to discover something more," says Atre, who was awarded the Padma Vibhushan last month. She has earlier received the Padma Shri in 1990 and the Padma Bhushan in 2002.

Atre, at 90, may come across as an orthodox musician but a look at her oeuvre tells otherwise. She has nurtured this knowledge and at the same time questioned it. She challenged existing ideologies of classical music, in the way it's taught to young adults, in the allegiance to a *gharana*, the adherence to singing a raga at a particular time and has been fascinated with the idea of using *sargam* (solfège) to present her *khayals* (thoughts). *Sargam* is declasse in classical music since it is used to understand the form at the beginner level, but it became the topic of her PhD in 1974. Her radical thoughts have riled many. But Atre is unfazed. "One needs to analyse and present a thought with logical reasoning even when it's something as technical and abstract as the classical arts," she says. According to Mumbai-based musicologist Deepak Raja, "Prabha Atre is a thinker, and one of the most respectable vocalists in the country."

Her ability to question the art form probably comes from the fact that she was not born into a family of musicians. "Forget about performing classical music, no one had even heard it in my family," says Atre. Sometimes, the radio played at home, in Pune, and Atre found herself being pulled in by the voices of Noor Jehan, Begum Akhtar and Ustad Bade Ghulam Ali Khan.

But real learning happened when she met her *gurus*. Her father, a headmaster, employed a harmonium *guru* for her ailing mother. Though her mother quit after three-four lessons, Atre continued. She was in her mid-teens when her father's friend took her to Mumbai-based vocalist Sureshbabu Mane, son of Ustad Abdul Karim Khan of the Kirana *gharana*. Atre sang *Ka karoon sajni*, Ustad Bade Ghulam Ali's famed *thumri* in *raag* Sindhu Bhairavi. Mane was impressed and agreed to teach her.

Four years later, when Mane died in 1953, his sister Hirabai Barodekar took her on as a student for the next couple of years. "My *gurus* were very open-minded and would always say 'don't be a photocopy'. They gave me a strong foundation," says Atre. She also graduated in science followed by a law degree.

Atre joined All India Radio, Ranchi, as an assistant producer in 1960, where she was introduced to a variety of musicians and genres, including Carnatic classical and Western pop. She was fascinated by the music of Ustad Amir Khan, the founder of Indore gharana, Patiala *gharana* legend Bade Ghulam Ali Khan, and Roshan Ara Begum of Kirana *gharana*. This is when she was deepening her quest to critically analyse her own music. "There is art and then there is the *shastra* (science) behind it. Art will change with time, so the *shastra* can't stay behind. My background allowed me to have a scientific approach to an abstract form," says Atre. By then, she had begun to perform and was a rising star in the concert circuit in the '60s. Like everything conventional, she grappled with the idea of marriage and decided it was not for her.

> Atre's scientific approach to Indian classical music has deepened her quest to critically analyse her own music

In those days, alongside her was Kishori Amonkar — Indian classical vocalist Mogubai Kurdikar's temperamental and talented daughter — whose popularity was on the rise. "Kishori took the vocal music world by storm. But Prabha retained her individuality and stature even at a time when the Indian music world was swept by the Kishori wave," says Raja.

By the middle of 1971 came an HMV record that overwhelmed the *rasikas* (aesthetes). It was Atre's presentation of two much-loved *ragas* — Maru Bihag and Kalavati. Atre was 43 then, presenting one of her own compositions, not common at such an early stage. "The way we think of Kishori *tai*'s Bhoop, we associate Maru Bihag and Kalavati with Prabha *tai*," says Hubli-based Jayateerth Mevundi, a leading vocalist from the Kirana *gharana*. "I see children singing her *bandish* (composition) *Tana mana dhana* in music competitions all the time. They may not know who's composed it but that's how popular it is," he says.

After her last stint at AIR in 1970, Atre headed the music department at SNDT University, Mumbai, from 1980-92. There she turned around the curriculum, making it broader in approach, allowing students to explore various genres of music. According to Raja, there is hardly anyone who's been a full-time teacher and retained a top-class status in the performing field. "Full-time teachers tend to be academic. But in her case, it did not stifle her," he says.

Mumbai-based classical singer Chetna Banawat-Pathak, who has learnt from her for 24 years, remembers travelling with Atre for concerts. By the time they would reach a destination, a new *bandish* was ready. "Her *raag* Bahar *bandish, Ritu bosant aayi*, was created on the train. One has to not just know the art form well, but go deep into the ocean for this," says Banawat-Pathak. Atre's inward reflections have led to many new ragas.

When Atre is not composing and performing, she is writing books. Her book *Enlightening the Listener — Contemporary North Indian Classical Vocal Music Performance* (Coronet Books Inc, 2000) is a guide to understanding finer details of classical music. "I wanted to explain the idea behind this system, teach it to students, and explain it to the masses," says Atre, for whom the audience, often inconsequential to the concept of classical music, plays a significant role, "If we want people to appreciate classical music, then we have to make it approachable," she adds.

To the world she is a scholar and a musician, but to her students, she is a friend and a mother, who sometimes cooks a typical Maharashtrian meal for them. Even after all these years, Atre's discipline and commitment is impeccable. It's probably why Atre sounds euphonious even at this age.

A couple of years ago, there was a theft in Atre's Pune home; some cell phones, pen drives and hard disks were stolen. It was 4.30 am and Atre was immersed in her *riyaaz*. She heard some rustling in the next room, she told the police later, but she continued to sing.

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DOWN IN JUNGLELAND

Ranjit Lal

Ranjit Lal is an author, environmentalist and bird watcher

Wish You a Good Flight

Human disdain for nature's feats — the art of flying, of birds and bees

LITTLE CHILDREN, especially in the "developed" world, are spun yarns every Christmas about Santa's massive toy workshop in the North Pole where toy orders are taken from children around the world, elves get busy making them and Santa personally distributes them to delighted children (only if they've been good). Children soon cotton on to the impossibility of this endeavour, so when the scales fall, why not replace that story with another — equally miraculous, but true?

Mother Nature runs the most fantastic and advanced Research and Development facility, to make every living species on the planet "bespoke". Her research labs have been functioning non-stop for around the last four billion years or so. Some of her products take millions of years to perfect, few reach the stage of no further development; she goes on refining her designs, generation after generation, lest she gets trolled by disgruntled users.

This process is called evolution, and we humans think we are the most "evolved" of all but never pause to appreciate her achievements, even though we copy her ideas wholesale, without paying a penny in royalties. Let's look at some of her miraculous achievements:

Take flight, for example. Aeons ago, some creatures on earth decided there had to be a better way of getting around rather than running or swimming to escape from other creatures who could run and swim faster than they could. In desperation, they began jumping off trees and cliffs. Mother Nature noticed and tweaked the genes in some of these creatures, gradually turning their scales into feathers and feathers into wings. Keratin, already present in their hair, nails and scales, was the perfect raw material for this. Strong, flexible, and light. She also decided that feathers ought to serve multipurpose. Some were designed to keep the creatures warm (as anyone with a goose-feather down jacket knows), some would turn to powder, to keep the other feathers in top condition, and the most important ones would develop into wings, so the creature could fly. Obviously, she had studied the basics of aerodynamics and knew the flight feathers had to serve dual purpose: provide both lift and thrust.

Another great idea was to add pigments to feathers, or

RANJIT LAL

FLIGHTS OF FANCY

Big broad wings for soaring

make them prismatic so that they weren't only glamorous (and attractive to the opposite sex), but also camouflaged the user. The whole creature (*aka* bird) had to be redesigned so that it faced the least resistance from the air — it had to be streamlined in order to be energy-efficient.

Powering flight posed another problem. Some birds wanted to fly enormous distances, and needed explosive bursts of power to escape predators. The marathoners needed a constant replenishment of oxygen to their muscles, that meant a constant supply of blood (thus, waterfowl has dark meat) and the "exploders" (like partridges and chickens) were given glycogen (a form of sugar), which provided the needed bursts of power, but which depleted rapidly (hence they have white meat).

Of course, not all customers were happy! Some wanted to streak through the sky like meteors, others to spend the whole day at 10,000 ft without having to flap their wings, still others wanted to be able to do aerobatics, and some (like anti-vaxxers) didn't want to fly at all — some still preferred swimming and diving or simply running. Ever-accommodating, Mother Nature obliged. So, vultures, condors and pelicans developed enormous broad wings on which they caught the thermals: falcons, swallows, and swifts narrow "fastback" wings provide speed and agility, and a vast majority (like mass-market cars) were general-purpose and could do both the jobs, adequately if not spectacularly. The "runners" (like ostriches) were given massively long, powerful legs (and wings to flounce around with), and the "swimmers" (like penguins) had their wings turned into flippers.

But there were myriads of smaller creatures (that far outnumbered birds) who wanted to fly, too: they wore their skeletons outside their bodies, usually had the aerodynamics of a brick, were cold-blooded and had no backbone. Insects! Mother Nature went back to the drawing board. These little guys were too leaden to get off the ground using conventional aerodynamics — there had to be an out-of-the-box solution. How about unsteady aerodynamics? They had another wonder material, *chitin*, which was strong and so flexible you could twist it over completely — perfect for wings and twice as efficient as birds' wings. By twisting, they could generate both lift and thrust with both the down- and up-stroke (in the avian world, only the hummingbird has filched this idea). Also, Mother Nature knew about tornadoes and used the same principle to enable insects to fly by making them generate little tornadoes at the tips of their wings (called vortices).

We'll check out other wonders in future columns.

How the Lotus Blooms

Technical finesse allows heritage and innovation to co-exist in preserving a grand monument

Living History

AN INDIAN EXPRESS COLLABORATION WITH THE RASHTRAPATI BHAVAN

Anurag Khare and Vaibhav Jain

PHOTOS COURTESY THE RASHTRAPATI BHAVAN

AS THE Republic Day celebrations culminated with the Beating Retreat ceremony on January 29, the Rashtrapati Bhavan was illuminated again. Along with North Block and South Block, on either side, a magical screen of myriad hues created a fantastic panorama. Adjectives like "majestic" and "monumental" can do no justice to the grandeur of the building that is at the heart of the Indian Republic.

Its history and its role as the seat of power lend majesty to the structure, but even in purely architectural terms, Edwin Lutyens' marvel stands on its own. Woven into his Edwardian Baroque opus are numerous Indian motifs and designs — lotuses and elephants, *chhatris* (cenotaphs) and *chhajjas* (roof eaves).

The monument has been a witness to the dramatic transformation of India since 1911, when plans for the building as a grand palace for the viceroy was drawn out. The construction was completed in 1929. The tumultuous century left its imprint on the building, too. Like any building nearly a century old, the Rashtrapati Bhavan has endured the ravages of time and weather.

The building and the surrounding estate, spread over 320 hectares, has been central to our national life. It is part of our cultural heritage and efforts have been made repeatedly to preserve it for future generations.

Maintaining the building is challenging in terms of civil engineering. With the passage of time, its amenities have to be upgraded, replacing old equipment with modern elements and adding more. Everything has to be done without altering the character of the building which is classified as "Heritage Grade 1". For such buildings, rules prohibit "any intervention on exterior or interior or natural features unless it is necessary in the interest of strengthening and prolonging the life of the building or any part or features". Therefore, it's absolutely essential that minimum changes are allowed, and when they do, that they conform to the original.

Preserving this monumental part of our heritage is, thus, a delicate task — more so, since it is not a monument that closes in the evening. The Head of the State lives here and hundreds of people work here. Yet, the building has largely been in good health.

However, the *chhajja* have been a preservation challenge. In the Rashtrapati Bhavan, the *chhajja* runs a total of 1.2 km along the periphery of the main building. It was built with lime concrete with reinforcement, and located nearly 20m above ground. The bottom of the inclined *chhajja* has architectural embellishments such as the iconic lotus petal, in a repetitive protruding pattern. Due to weathering, the *chhajja* faces "delamination" — the material fractures into layers — and bending, along its length, at several points. This often necessitates repairs, which used to be done piecemeal.

ROOF OVER

(Clockwise from top) Woven into Edwin Lutyens' Edwardian Baroque opus are numerous Indian motifs and designs — lotuses and elephants, *chhatris* and *chhajjas*; with structural lightweight concrete and innovative technology, the cracks in the *chhajja* have been fixed; the *chhajja*, which runs 1.2 km along the periphery of the main building, was earlier fractured in layers at multiple places

In 2019, however, parts of the *chhajja* collapsed at a few locations. Such erosions not only affect the aesthetic appeal of the building, but sizeable chunks of lime concrete falling from a height of 20m can be fatal for those below. It was time to tackle the issue in a holistic manner and repair not just parts but all of it.

A structural assessment of the *chhajja* was done. Its condition was worse than it seemed. There were continuous horizontal cracks and significant deflection at several locations. The material quality had deteriorated so much that the lime concrete would detach and fall off even with a slight tap of the hammer. Even as loose concrete was being removed, a span of around 20m length of the *chhajja* collapsed, exposing the corroded reinforcements.

Repairs began in 2020. The biggest challenge was to stop further corrosion of the reinforcement. The solution was "cathodic protection", an electrochemical process, which is a "dual-phase hybrid fusion anode system". This is a simple method that connects the protected metal (reinforcement in this case) to the more easily corroded "sacrificial metal" to act as the anode. The sacrificial metal then corrodes instead of the protected metal, and results in an increased life span of the structure. Also, casting of the *chhajja* with commonly available materials such as normal concrete was ruled out as excessive deflection was observed. Finally, structural lightweight concrete (SLWC) was identified as the most suitable material.

The restoration plan was in place by now. The entire *chhajja* portion, extending beyond the fixed end, was to be removed and recasted with SLWC. The lime-concrete *chhajja* would be supported at the height of 0.5 m, 1m and 1.5m from the fixed end before removing the existing concrete to prevent corroded reinforcement from collapsing. Existing reinforcements would be retained and additional reinforcements needed to be provided via lapping or chemical anchoring wherever bars were corroded more than 20 per cent. Then, cathodic protection was implemented verifying the electrical continuity across the entire reinforcement network of the *chhajja*.

Given the Grade 1 norms, the exact form and design of the *chhajja* had to be recreated. The *chhajja* follows the steps and curves of the building along its perimeter, retaining a steady declination for rainwater runoff. This decline made manual plotting of the existing form quite complicated. Advanced computer technology was used. With light detection and ranging (LiDAR) scanning, a three-dimensional model of the whole *chhajja* was created. Based on the model, the formwork with the same feature and design was prepared using fibre-reinforced polymer (FRP) moulding technology.

Meanwhile, every lotus petal beneath the *chhajja*, which forms an integral part, has a unique shape. That pattern had to be recreated, using the FRP-moulded formwork.

The use of SLWC also tested the ingenuity of the team. Premixed off-site, it is brought in bags — negotiating busy vehicular traffic and VVIP movements. Then, it has to be placed at a height of 20m — all within three hours, as the material is highly sensitive to temperature. Also, the work has to go on behind green curtains of camouflaging, not affecting functions inside and outside the building.

Currently, the progress is satisfactory. About a quarter of the North Court is complete and the rest will be done by the end of this year. It has been a demanding task, calling for technical skills, innovative thinking and utmost respect for heritage. Paradoxically, the best compliment would be no compliment at all, because nobody, other than experts, can tell the difference.

Anurag Khare is superintending engineer and Vaibhav Jain is executive engineer of CPWD, posted at the President Estate

'The novel truly represents the farmer class'

Filmmaker Gurvinder Singh, 47, on his new film, Punjab farmers, and giving up literary adaptations

Alaka Sahani

Your latest Punjabi film *Adh Chanani Raat* (*Crescent Night*), which premiered at the International Film Festival Rotterdam, is based on Gurdial Singh's novel of the same name. Why did you revisit his writing?

After *Chauthi Koot* (2015), based on two short stories by Punjabi writer Waryam Singh Sandhu, I thought of working with another story from Punjabi literature. I considered some other literary works before going back to Gurdial Singh, whose novel I'd adapted for my first feature *Anhey Ghorhey Da Daan* (2011). *Adh Chanani Raat* is different from both *Anhey...* and *Chauthi Koot*. Unlike them, where the story unfolds in a sociopolitical backdrop, this film is more about one person Modan (Jatinder Mauhar) and his family. It's about how the landowning class has not changed.

The novel is much darker in comparison.

Yes, the novel takes a completely different turn. But I was clear about not wanting to make a dark movie. My film is more about hope even though it shows how violence can become a vicious circle. However much one may try to move away from it, the acts of violence continue to haunt. The film doesn't end on a definite note. The crux of the movie is the longing for home and family. The original story and the novel's characters needed some reworking. Gurdial ji passed away in 2016. We sought permission from his family for the changes.

In the film, have you, in a way, captured the insecurities and vulnerabilities of the farmers who were, until December, on a prolonged protest against the Farm Bills?

There is not one kind of farmer in India. I'm now familiar with that section of farmers who protested against the Farm Bills (passed in September 2020). The novel truly represented this class. We had already finished shooting the film when we saw the whole community come out in protest against the farm laws. They were insecure about whether the land would continue to remain with them. It is not overtly defined in the movie, which has touched upon the conflicts over ownership of land. The protagonist's family comes apart over this issue.

You work with non- or lesser-known actors. How did you cast for this film?

It's intuitive, more to do with their presence on screen as I don't do any kind of audition. Selecting actors is like choosing colours for a painting. I see actors like palettes. Once you've cast your lead actor, it becomes easier to choose actors for the other characters. While reading the novel I'd thought of casting Samuel John (the lead in *Anhey...*) as Modan. Later, I decided to cast him as Modan's friend and chose Jatinder, a Punjabi filmmaker, as the lead, even though he hadn't acted before because he has that kind of presence which I believed could work for Modan. For the role of his wife Sukhi, I asked Mauli Singh, a former journalist, and publicist. I had no idea then that she had studied theatre and acted in Punjabi movies and TV shows before moving to Mumbai.

NIGHT WATCH

(From top) A still from the film *Adh Chanani Raat*; director Gurvinder Singh

Your movies are visually rich. Does it come naturally since you are a painter too?

This time, I didn't want to make a visually-rich movie, thus there are really long takes. I let the actors carry a scene rather than the camera having a major presence in the *mise-en-scène*. It is my third film with cinematographer Satya Rai Nagpaul and, I feel, it's his most refined work. In *Anhey...*, the camera is always after something. In *Adh...*, the camera is a silent observer.

***Adh Chanani Raat* is the last movie in your 'Punjab trilogy'. What next?**

These three movies give a sense of completion. I don't wish to adapt any more literary work after this. These are stylistically different from each other while being rooted in the same culture. They do have some similar concerns. What I make after this would be a new way of looking at cinema.

What stories will you be telling after this?

I've been living in Punjab for over two years. In this period, I've seen, observed, and met so many people. There are many stories I've heard from people. Till now, I took the help of the writings by Gurdial ji and Waryam ji to understand the recent past of Punjab. As for present-day Punjab, I've experienced that to be able to tell stories about it. I've written scripts around this.

You had posted on social media about a streaming platform not picking your film.

They should invest in films that cater to a niche audience. There can be a special segment for independent cinema. Sometimes, the audience doesn't know a certain film is available. These films have to compete with Hollywood and Bollywood titles and get lost there.

What are your views on the merger of the government film media units with the National Film Development Corporation?

The government has promoted certain kinds of films which espouse 'nationalism' and 'Indianness'. We've a great cinematic heritage that should be preserved. These bodies are interlinked and interdependent. A merger can be a good thing provided it leads to efficiency and the mandate of these bodies is not diluted.

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A Life Lived Queen Size

In a new biography, Ritu Menon captures the indomitable spirit and perseverance of Zohra Segal, the theatre doyenne who held the nation in thrall for over seven decades

Kirti Jain

AUTOBIOGRAPHIES OR memoirs, particularly of artistes, I have always found more fascinating than biographies. For one, they record a kind of oral history that is valuable because it gives a more vivid picture of their life and brings alive the multilayered context of their times. Second, the way memories are mediated reflects another aspect of the personality of each writer in terms of what they want projected and what they choose to hide. Third, being in first person, it captures the nuances of expressions, language, cultural symbols, and, therefore, the whole personality in a way that would be difficult for a biography to evoke. However, I found an unusual exception in Ritu Menon's biography of Zohra Segal — *Zohra! A Biography in Four Acts*.

Segal's autobiography, *Stages* (1997), written by Joan L Erdman with Segal has more details and, yet, is more staid and tedious. Menon's biography is an absolutely delightful read. It captures the mischief, impulsiveness, courage, perseverance and the indomitable spirit of Segal in a way that her autobiography did not. In any case, Segal's life is like a roller-coaster ride with breathtaking ups and downs from pre-independent India to the 21st century, a period that coincides with a time in Indian and world history where new cultural movements were in the making and Segal played an active part in them. How many of us can boast of a life lived as fully as hers till the ripe old age of 102? To capture this life in words is a stupendous task — and Menon carries it out with elan and grace.

The book is aptly titled for it unfolds with all the theatricality of a play, scene after scene. I was hooked to it from the first line: "Uday Shankar was her first love — as was dance. Zohra Mumtaz, all of 23 in 1935, couldn't believe her eyes when she received the following cable from Shankar: 'LEAVING FOR JAPAN TOUR ELEVENTH AUGUST STOP CAN YOU JOIN IMMEDIATELY'." One immediately wanted to know how this came about and what happened subsequently. Then, Menon mentions that if there was one trait that Segal happily admitted to, it was her impulsiveness. Just as she impulsively decided to join her uncle on a road tour from Dehradun to Lebanon, "It was impulse again that made Zohra declare in Beirut that she wanted to be an actress. Very well, responded her cousin Mahmud, let's see how you improvise: imagine your lover has sent you a letter saying he will not be able to meet you tonight. Before Zohra could arrange her expression to indicate dismay or disappointment — or even relief — she had changed her mind and decided that she wanted to be a dancer instead." And so, off she went for training in dance to Germany, her impulsiveness beautifully captured in these few sentences. That is how the whole biography reads — colourful and evocative. It has a light touch but is packed with a mine of information that would be a delight to anyone interested in the cultural history of the country.

Then follows a treasure trove of information about Shankar's journey as a dancer, his starting as a magician performing for King George V in London, going on to touring the world and finally setting up the legendary Almora Dance Centre. This book provides a rare documentation of its beginnings, its supporters, its dancers and members, and its methodology. I was fascinated to read that among the sponsors of the centre were luminaries like Jawaharlal Nehru, (Russian actor) Michael Chekhov, Sir Feroz Khan Noon, Rabindranath Tagore, (American dance critic) John Martin and (French novelist/dramatist) Romain Rolland. Among its members, apart from Zohra were (theatre person) Gul Bardhan, (dancer) Sundari Shridharani, (actor-director) Guru Dutt, (writer) Nayantara Sahgal and (dancer-stage director) Shanta (Gandhi). The legendary Ustad Allauddin Khan also agreed to join for music. One can only imagine how electric the environment must have been. The place had a magic where an artiste like Segal blossomed, and also found her life partner in Kameshwar Segal.

EXPRESS ARCHIVE

ENTER STAGE RIGHT
Actor Zohra Segal at her residence in New Delhi in 2014

ZOHRA! A BIOGRAPHY IN FOUR ACTS
BY RITU MENON
Speaking Tiger
272 pages
₹599

I must say that the book reads like the *Arabian Nights*, unfolding one story after another, the common thread to all of these being *shehzadi* Zohra. Each story is about some legendary personality, event or institution. Brief history of all these has come alive through painstaking research into archives, interviews with friends and relatives, and putting together stray references.

Act II of this life drama is about her shift to Mumbai after a brief stint in Lahore trying to run a dance school there in pre-independence India. In Mumbai, she lived in the same house as the Anands (Uma and Chetan), along with Dev Anand, Balraj Sahni and his wife Damyanti and regularly met a huge artiste community. It is from here that Segal made a switch from dance to theatre by joining Prithviraj Kapoor's Prithvi Theatre in 1945. She spent more than 14 years acting, choreographing and touring with the company. Thanks to the personality and work ethic of her mentor Kapoor, whom she called "Papaji", theatre and acting became her second passion — one which she pursued till the end of her life. This part is a superb documentation of the work and ethos of Prithvi Theatre. Segal left Bombay when, close on the heels of her husband's sudden death, Prithvi also closed down. She had now lost both her anchors. She called this period "a period of dying".

Meanwhile, her children had grown up. So, the intermission consists of her moving briefly to Delhi, where she tried her hand at art administration. Not really enjoying it, she grabbed the chance to go to London for a 10-week acting course at the British Drama League. Act III is about London, where she tried bit roles on the stage. This phase of her life also throws light on the lack of space for diaspora Asian artistes in British theatre and television. With her talent and tenacity, Segal gradually made her presence felt in serials and films there. In the last Act, she returned to Delhi in 1987 and continued to travel for film and theatre projects, which not only kept her in the limelight but also helped earn a livelihood.

There are so many significant details that this biography offers. I would recommend it strongly to those interested not just in the life of Segal but also wanting to know about institutions and individuals who were significant but their role has not really been documented well. I will end this review with the lines Zohra mentioned in an interview... "I didn't want money; I was interested in fame, I wanted power." She did get that in abundance. And she deserved every bit of it. Hats off to this feisty diva — an inspiration to us all.

Kirti Jain is a Delhi-based theatre director

What We Lack

A critical engagement with history looks to creating an action plan for the future

TCA Raghavan

MAKING INDIA Great Again, as the title, does suggest that the work aims to give prescriptions on how a long past golden age can be reconfigured. That, however, is not the intention of the Rajivlochans. Their aim is to closely scrutinise some aspects of our history and extract from it a list of deficiencies as action points to be addressed and fixed as India looks to the future. Finding "lessons" from history is, of course, treading on a slippery path but within the methodological limits posed by this caveat, their book is a thought-provoking effort to critically engage with our history with a view to our present predicaments. The latter, in particular, can be summarised as simply that while we have made some good progress and have substantial achievements to our credit, our performance remains under potential and others have done better.

In pre-colonial times, India had developed a certain dexterity in establishing complex financial institutions; it had substantial achievements in mathematics, as well as a level of technology which demonstrated that it was second to none in the world in these and related skill sets. Yet, colonial conquest, economic exploitation and degradation followed at the hands of external powers that were smaller, weaker and, in many ways, less developed. Why did this happen? The answer that the book develops has different dimensions but each emerges from one central impulse: "A certain inability to systematise information". The authors explain at the outset "whether it is taxation, fighting battles or doing business and making money, it is a superior quality of information that would decide who might win and who finally loses. The encounter with the English East India Company in the 17th and 18th centuries is important in that it shows both missing pieces. It is neither superior technology, nor a greater access to capital that gave the Company decisive advantage over local rulers and merchants. These advantages were generated by superior record-keeping, a high quality of information for better decision-making and the knowledge that trading produces more profit when protected by the authority of the state."

MAKING INDIA GREAT AGAIN: LEARNING FROM OUR HISTORY
BY MEETA AND RAJIVLOCHAN
Manohar Publishers
299 pages; ₹320

This thesis is fleshed out with examples from our history: the House of Jagat Seth in eastern India; the making of high-quality steel that had a great reputation internationally till well into colonial times, and, the many achievements in mathematics, but no comparable achievement in other sciences or in marrying science to practical knowledge to advance and scale up technology. In each of these varied fields, the authors point out the common thread running through is the absence of systems for systematising information and experience to establish a knowledge pool which could be transmitted, replicated and scaled up. Thus, in India while "knowledge was important, knowledge systems remained distant". India fell behind, in other words, because Indians were deficient in collecting, organising and passing on knowledge to create ever expanding "systematic networks of information and trust". In contrast, Europe "forged ahead to use its collective knowledge, accumulated over generations, to bring in industrialisation and associated efficiencies, reduction in the cost of production and enlargement of the scale of society." Thus, India remained as it was while the world around it changed.

Why didn't Indians change when they saw Europeans doing things differently? At times, the authors suggest that existing endowments in terms of rich natural resources were so plentiful that there was little incentive to change. More convincing is the argument that "Indian society found it difficult to generate means, whether formal or informal, of exchanging information across groups." These deficiencies also had a direct impact on political and military power. The Marathas lost to the English not because they lacked superior firepower or were deficient in numbers but because the English, Scottish and Eurasian officers they relied upon were not going to fight the English. But "no Maratha chief had ever cared to set up any institution for formal training of their officers" and, thus, the larger failure was the inability to understand the value of knowledge systems.

This, the book argues further, is by no means restricted to the story of India's past. If India is to become a wealthy nation we need to, it says, "build a learning society" which means "a society that is self-reflexive; that constantly takes feedback" and "we should stop looking for feel-good arguments which only see India as a victim". These are conclusions difficult to disagree with and the book is a serious effort to understand and explain our sub-optimal performance in different fields.

TCA Raghavan is a former diplomat. His latest book is History Man: Jadunath Sarkar, GS Sardesai, Raghubir Sinh and Their Quest for India's Past (2020)

SHELF LIFE

March of History

IN HER deeply researched book, by placing the work of the triumvirate: Ritwik Ghatak, Mrinal Sen and Satyajit Ray in the "postcolony", author-professor-historian Rochona Majumdar, "activates the past". Since the epic task of a comprehensive analysis of the Indian art cinema's movement isn't for a book to realise, she zooms on what's proximate and familiar, to the fount that paved the way for future rebellious cinematic voices to emerge.

She locates her accessible academic book — laced with evocative archival film stills, scene dissections and criticisms dug from the dustbin of history — in the "postcolony", the post-independence decades, whence emerged Ray and his confrères. The postcolonial, what she calls the "long present", begins with colonialism and continues to the present day.

She references English critic-filmmaker Marie Seton's efforts, in the 1950s, to establish "art cinema as a universal idiom"; and the 1951 Film Enquiry Committee acknowledging the form as "good cinema", aiding the nation-building process.

Majumdar charts the march of history through the trilogies of the respective auteurs: Ghatak's 1960s' Partition trilogy (*Meghe Dhaka Tara, Komal Gandhar, Subarnarekha*), Sen's (*Interview, Calcutta 71, Padatik*) and Ray's (*Pratidwandi, Seemabaddha, Jana Aranya*) 1970s' Calcutta films. If the "tragedy of Partition" was desolate and unrelenting Ghatak's "lifelong obsession", the Bengal famine, was angry Sen's cinematic deliberation. The Nehruvian optimism of chronicler-ethnographer Ray dissolves into seeing "the contemporary as deadlock in nation's history". It is to the "forgotten futures" one needs to look back in anger — the "utopian desire for unity" that Ghatak ended his meditations on loss and longing with, the "betrayal of ancestors" that Sen invokes, to hammer in the speciousness of democracy, jolting public into "questioning national sovereignty, when people remained poverty-stricken, unemployed, insecure in the new republic", and the hope for a more (gender and racial) "equitable, yet unattained, future" as seen in Ray's *Mahanagar* (1963).

ART CINEMA AND INDIA'S FORGOTTEN FUTURES: FILM AND HISTORY IN THE POSTCOLONY
BY ROCHONA MAJUMDAR
Columbia University Press
307 pages; ₹699

Sen created the original onscreen Angry Young Man — starting with Ranjit Mallick in *Interview* (1971), replete with political ambivalence — which was amiss in the more popular Hindi film's Vijay, essayed by Amitabh Bachchan. But the woman question sticks out like a sore thumb. Ray's "crisis of historicism" in his city films was in showing women as ciphers, their "complexities and quirks" not fleshed out like the men's. Ghatak projected a sacrificial lamb, and Sen a disillusionment with the absent intersectionality in the women's movement.

History moves in circles. The first blow to art cinema came with the restructuring of the National Film Development Corporation (NFDC) in the 1980s. Today, as NFDC is set for yet another restructuring, the statist erasure of art cinema might be near-complete. The book exhorts that art cinema, as a tool of history, offers resources to live through our disorienting times, of "global pandemic, authoritarian politics... and tremendous might of neoliberal states challenging conditions of being citizens and humans".

TANUSHREE GHOSH

To the Men Who Never Loved Us

A superstar becomes the starting point in this book that examines gender relations

Adrija Roychowdhury

RARELY DOES a book appear as if it was written just for you, to help you make sense of your life. Shrayana Bhattacharya's book is one of them. The title might suggest that the book is about Shah Rukh Khan and how a generation of women are hopelessly looking out for him. But going through the interviews carried out by Bhattacharya of female fans of Khan, spread out across class, caste, professions and religion, one realises that the actor is, in fact, a myth, a symbol of a particular kind of romance these women are seeking. In spite of the multifaceted backgrounds, a few things are common among all her interviewees. One, of course, is that they love Khan and everything he represents. They also grew up in post-liberalisation India and desire a life of economic independence in which men are desired for companionship and not for financial security.

Last year, I turned 31. In a locked-down year, conversations around marriage and "settling down" became harder to dodge. Unhappily, I settled for the idea of an arranged marriage. A matrimonial agency was found and a profile created. What followed is a saga best forgotten. Men with illustrious degrees, high-paying jobs and from "good families" were put on display. One MBA graduate told me that he wants a career woman, but too much time spent on the job meant that I am bad with time management. Another rejected me with the explanation that while he appreciated my career aspirations, he wanted someone whose priority would be the family.

I was unable to articulate to my parents what exactly I was looking for. I wanted someone to acknowledge my aspirations, appreciate my independence and be proud of my accomplishments. I wanted the Shah Rukh Khan of the movies I had grown up watching, one who would look into the eyes of the woman he loved, open his heart and arms to her and admire her for who she was. If I told this to my mother, she would likely roll her eyes in despair at my impracticality. "Marriage is about compromise" she would tell me, as she has, so often in the past.

Yet, as Bhattacharya's book shows, I am not alone in craving for such a partner. Through hard data and long conversations, she has established the struggle women face to find a unique combination of independence and intimacy in a post-liberalised India. Despite the many leaps and bounds made by the Indian economy after the historic reforms of 1991, gender relations in the country continue to be steeped in inequality.

DESPERATELY SEEKING SHAH RUKH: INDIA'S LONELY WOMEN AND THE SEARCH FOR INTIMACY AND INDEPENDENCE
BY SHRAYANA BHATTACHARYA
HarperCollins India
445 pages; ₹699

Money and love and the interaction between the two is the running theme of Bhattacharya's book. Interestingly, while more money ensures more love for men, for women, it plays out otherwise. "Women feel more loved when they toe the patriarchal line, when they prop up powerful men," she writes. The numbers put together by Bhattacharya testifies to this sad reality. "As the Indian economy grew at an average of seven per cent between 2004 and 2011, the share of women in the labour force fell to 33 per cent before plunging even further between 2011 and 2017 to a historic low of 23.3 per cent," she writes. This, despite the fact that in post-liberalised India there has been a sharp increase in the number of educated women.

Then there are those like Vidya, a Delhi-based engineer, with degrees from some of the best institutions in the world, working for a hefty pay package at a private foundation. Her boyfriend of nine years had broken up with her for her supposed "arrogance". Over the years, she kept meeting men who were just as disappointing. Vidya belongs to a minority of women, the true beneficiaries of liberalisation, who choose to remain defiant, opting for financial independence over settling down with a man far from their dreams. "Blame the Shah Rukh movies, the books I've read, but I just won't do it!" she says.

The relationship between love and money plays out differently as one moves down the class ladder. The women of *agarbatti* (incense sticks) colony in Ahmedabad have benefitted from the emergence of home-based jobs. But they realise the precariousness of their newfound independence. Most are married to men with unstable incomes and raging tempers. They are fearful of losing their love. So, they silently endure violence at home and find respite in Khan's movies.

Bhattacharya's approach to gender is unique. In exploring Khan's fandom, she reveals why Indian women continue to struggle in the workplace, the kitchen and the bedroom. Economic theories and data blend beautifully with her anthropological approach. For instance, she writes about a east Delhi accountant who spent years finding a government job. Her parents finally stopped looking for a groom for her in her mid-30s when a prospective suitor and his family complained about her complexion, suggesting that the travel to office and back was making her dark. That day, the accountant cried afterwards. "These matches were always insulting my hard work and everything I had done in life," she tells Bhattacharya. My heart went out to the woman. Aren't we all seeking the same things in love — to be seen, acknowledged and appreciated?

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