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WHO

Bimal Gurung, fighting for Gorkhaland

An unprecedented 45-day shutdown in the Darjeeling hills, with no end in sight, has put the spotlight back on Bimal Gurung, leader of the Gorkha Janmukti Morcha (GJM), which announced a fresh agitation for a state of Gorkhaland on June 15. It was almost 10 years ago, in October 2007, when Mr. Gurung pulled the rug from under the feet of his mentor Subhash Ghisingh, president of the Gorkha National Liberation Front (GNLF), and marked the beginning of a new era in the politics of the Darjeeling hills by setting up the GJM, which raised the pitch for Gorkhaland afresh. Now, the 53-year-old stares at political uncertainty over the demand.

Why the shift from tea?

Born to tea garden workers, Mr. Gurung had to do menial jobs while growing up to help the family. He has said his "life took a dramatic turn when the GNLF launched an armed struggle for a Gorkha homeland in 1986." He was 22 and became a member of the Gorkha Volunteers' Cell.

In 1988, he left the volunteers' cell

after the GNLF signed an accord with the Centre and West Bengal, leading to the formation of the Darjeeling Gorkha Hill Council (DGHC). In 1992, Mr. Gurung floated an organisation for unemployed youths from the hills. Seven years later, he was back with the GNLF after winning the elections as an Independent candidate from the Tukvar constituency. A sports enthusiast, he was entrusted with the Sports and Youth Affairs department in the autonomous hill body, which he administered well, and became popular among youngsters.

How did he fall out with GNLF?

In 2007, when the Centre and the State government were toying with the idea of including the Darjeeling hills in the Sixth Schedule of the Constitution and giving the tribal-dominated

area special administrative powers, Mr. Gurung seized the opportunity and launched a massive resistance in the hills.

In February 2008, Ghisingh had to face arguably the greatest humiliation in his political career when he was not allowed to return to the hills after a visit to Delhi, as GJM supporters laid siege to all the entry points of the hills. Since then, Mr. Gurung has been the most prominent political leader in the hills, with the GJM overshadowing all other parties.

Why did he agree to GTA?

After the Trinamool Congress came to power in 2011, ending 34 years of Left Front rule, Mr. Gurung used the chance to



enter into a truce with the government by signing the Gorkhaland Territorial Administration (GTA) agreement for setting up a second regional autonomous body in the hills. Mr. Gurung became the chief executive of the GTA and held the portfolio of 23 departments. With the help of his confidants, he ran the GTA and ruled the hills for the next six years. His wife Asha Gurung, also a GTA member, looked after the women's wing of the GJM. But the relationship with the Trinamool was uneasy, and less than a month before the term of the GTA was to expire, the hills plunged into uncertainty again. Protests erupted after Chief Minister Mamata Banerjee announced that Bengali would be compulsory for all students. She later clarified that it would be optional in the hills, but the damage had been done, and the situation reached a point of no return when the police raided the residence-cum-party office of Mr. Gurung at Pateleybas on June 15.

What is the road ahead?

As passions run high among the people

over the demand for creation of Gorkhaland, pressure is mounting on Mr. Gurung.

Though a Gorkhaland Movement Co-ordination Committee (GMCC), with representatives of all major political parties, has been set up to take the movement forward, there are rumblings within the GMCC that protests must be directed at the BJP-led government at the Centre with whom the GJM had entered into an electoral understanding in 2007 and for the 2014 Lok Sabha elections.

The murder of All-India Gorkha League leader Madan Tamang in May 2010 has also come back to haunt Mr. Gurung and other leaders of his party. There is still no news of tripartite talks with the Centre and the State that could help all stakeholders end the stalemate. In such testing times, it remains to be seen how Mr. Gurung finds a way out of the predicament.

He would not want to end up like Ghisingh, kept out of the hills.

SHIV SAHAY SINGH

WHAT

The lowdown on the right to privacy



WHAT IS IT A definite legal definition of 'privacy' is not available. Some legal experts tend to define privacy as a human right enjoyed by every human being by virtue of his or her existence. It depends on no instrument or charter. Privacy can also extend to other aspects, including bodily integrity, personal autonomy, informational self-determination, protection from state surveillance, dignity, confidentiality, compelled speech and freedom to dissent or move or think. In short, the right to privacy has to be determined on a case-by-case basis. Privacy enjoys a ro-

bust legal framework internationally. Article 12 of the Universal Declaration of Human Rights, 1948 and Article 17 of the International Covenant on Civil and Political Rights (ICCPR), 1966, legally protect persons against "arbitrary interference" with one's privacy, family, home, correspondence, honour and reputation. India signed and ratified the ICCPR on April 10, 1979, without reservation. Article 7 and 8 of the Charter of Fundamental Rights of the European Union, 2012, recognises the respect for private and family life, home and communications. Article 8 mandates protection of personal data and its collection for a specified legitimate purpose.

HOW DID IT COME ABOUT?

The trigger is the government's Aadhaar scheme, which collects personal details and biometrics to identify beneficiaries for government welfare schemes. A bunch of petitions was filed in the Supreme Court in 2015 terming Aadhaar a breach of privacy. The petitioners argued that Aadhaar en-

rolment was the means to a "totalitarian state" and an open invitation for personal data leakage.

The government countered that the right to privacy of an "elite few" is subversive to the right of the masses to lead a dignified life in a developing country. It said informational privacy does not exist before compelling state interests and is not an absolute right. It reasoned that collection and use of personal data of citizens for Aadhaar – now a law under the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act of 2016 – benefits millions of poor. The government claims Aadhaar is a panacea for corruption in public distribution, money-laundering and terror funding. Plagued by contradictions in the past judicial pronouncements on whether or not privacy is a fundamental right, a five-judge Constitution Bench of the Supreme Court decided to refer the question to a nine-judge Bench.

This nine-judge Bench, led by Chief Justice of India J.S. Khehar, for the first

time, is engaged in an intense debate with legal scholars and prominent lawyers on whether or not privacy is a fundamental right in the Constitution. At the same time, the judges and the legal community are vexed by the amorphous nature of privacy.

The government argues that right to privacy is not expressly included in the Constitution as the founding fathers rejected or jettisoned the idea of inclusion of privacy as a fundamental right. But petitioners insist that the recognition of privacy as a fundamental freedom is an essential deterrent against intrusion into personal space and data by state and private players in a technologically dynamic society.

WHY DOES IT MATTER

The apprehension expressed by the Supreme Court about the collection and use of data is the risk of personal information falling into the hands of private players and service providers. The apprehension is best expressed in the words of Justice Chandrachud on

the nine-judge Bench: "I don't want the state to pass on my personal information to some 2,000 service providers who will send me WhatsApp messages offering cosmetics and air conditioners... That is our area of concern. Personal details turn into vital commercial information for private service providers." Both the government and service providers collect personal data. This adds to the danger of data leakage.

WHAT NEXT

The Supreme Court repeatedly asked the government whether it plans to set up a "robust data protection mechanism." The court pointed to the fact that a large chunk of personal information is already in the public domain and gave an example of how a person accesses his Apple iPad by using his fingerprints. The court pointed out that the "state is obliged to put a robust personal data protection mechanism in place in this digital age."

KRISHNADAS RAJAGOPAL

WHY

do Lingayats want a separate identity?

What is the demand?

■ The Lingayats, a numerically and politically strong community of Karnataka, want to be categorised as a religious group separate from Hindus. Followers of the 12th century social reformer-philosopher-poet Basaveshwara who defied the caste system and Vedic rituals, they argue that the premise of this rebellion was rooted in opposition to the established Hindu order. Though Lingayats worship Shiva, they say the concept of 'Ishta Linga' (personal god) and rules of conduct prescribed by Basaveshwara cannot be equated to the Hindu way of life. On the other hand, those opposed to the re-categorisation, including sections in the community, say the rebellion was reformist, like the Bhakti movement, and not aimed at breaking away from the Hindu fold.

Why raise it now?

■ Though the demand for a separate identity is louder now, it is a 40-year-old wish. Many scholars, including M.M. Kalburgi, who was killed by unknown



assaults in 2015, have contended that the Lingayat tradition is non-Hindu in spirit. Religious heads too have joined the chorus for a separate identity, including Mate Maha Devi, the first woman seer of the faith who has often courted controversy.

The Akhila Bharata Veerashiva Mahasabha petitioned Chief Minister Siddaramaiah after a convention on July 15. The body had made a similar demand to the Centre twice earlier, which was rejected.

On July 20, a massive Lingayat rally at

Bidar surprised both the Congress and the BJP.

What are the political ramifications?

■ The timing is interesting with less than a year left for the Assembly elections in the State, where Lingayat votes matter in 100 constituencies. Lingayats, comprising 10-17% of the population and listed in the Other Backward Classes category, are a strong vote base of the BJP, and its State president B.S. Yeddyurappa is a prominent leader of the community. In fact, the BJP victory in 2008, marking the first saffron government in South India, is attributed to his ability to capture these votes, which could not be replicated in 2013 when he left the party to form his own, perhaps taking a large number of Lingayat votes with him. This is believed to have had a big role in catapulting the Congress to power in 2013. For the BJP, conceding the demand would run contrary to Hindutva, but it is not a section the party can afford to antagonise ahead of the polls. Mr. Yeddyurappa has opposed

the demand, calling it a Congress attempt to split the community. But the BJP has to face up to the challenge of offering the community something that can outweigh the benefits of the status of a religious minority. For instance, the Constitution grants linguistic and religious minorities the right to establish and administer their own educational institutions and Lingayat maths run a host of them. As for the Congress, there is no clarity yet on how many in the community are for or against this demand. In southern Karnataka, some of the influential religious heads have been conspicuous by their silence so far.

What is the way forward?

■ A State can have little to do with granting religious status to any community. Weighing his words, Mr. Siddaramaiah has said that if the community representatives submit a proposal burying their differences he will forward the demand to the Centre.

BAGESHREE S

WHEN

21 July 2017

Sound and fury: British director Christopher Nolan's war epic, *Dunkirk*, which tells the story of the evacuation of 330,000 British and Allied soldiers from a French beach in the eponymous town during World War II, has earned critical and box-office fame. In May 1940, multitudes of Allied soldiers were hemmed in by the Germans. The British, keen to save their men, not least for future battle, launched Operation Dynamo, an almost impossible rescue mission carried out by the British Army and a 100-odd civilian fleet. Nolan tells the story from the air, the ground and the sea, picking disparate airmen, soldiers, civilians and officers, backed by some stunning work by Dutch cinematographer Hoyte van Hoytema, who had won rave reviews for Nolan's last film *Interstellar*. Manohla Dargis of *NYT* called it "intimate and sweeping" by turns. Warner Brothers, which reportedly spent just under \$100 million for *Dunkirk*, must be pleased with its amazing run at the box-office, raking in \$100.7 million and counting. •AP



WHERE

In Rajasthan, a hill station marooned by rain



Mount Abu, the lone hill station in the desert State of Rajasthan, made headlines this week when it recorded the highest-ever rainfall on a single day. Torrential rain has been wreaking havoc in south-western parts of the State, leading to floods and devastation. The popular hill spot was cut off, and about 1,500 tourists, mostly from Gujarat, were stranded for several days.

What happened?

Mount Abu is situated at an elevation of 4,000 feet above sea level on a rocky plateau of the Aravalli Hills, in Sirohi

district, bordering Gujarat. Often referred to as an 'oasis in the desert,' the route to Mount Abu passes through the Abu Road town on the plains, from where the hill station is 28 km away. After continuous rain for several days, the hill town received an unprecedented 770 mm of rain on July 24, inundating low-level areas between the hills and creating panic among locals. Streams of water flowed with a ferocity not seen before, as roads were submerged and people were forced to remain indoors.

Does it get heavy rainfall?

During five days since Sunday, Mount Abu received a whopping 2,116 mm rainfall, breaking all previous records. According to the meteorological department's data for 1901-2000, the average annual rainfall at the hill station is 1,554.2 mm. The average rain during the monsoon months of July and August every year has been registered at 573.2 mm and 600.3 mm, respectively. Amid the heavy rain, life was thrown out of gear and the supply of essential items



was hit because of floods at adjoining places such as Pali, Jalore and other parts of Sirohi district. Telephone, cellular phone and Internet services went down, while the prices of commodities of daily use shot up.

How did it impact the town?

Two anicuts on the outskirts of Mount

Abu and the famous Nakki Lake situated at the centre of the town were overflowing with rainwater. While markets and offices remained shut for most part of the week, all schools and colleges were closed as a precautionary measure. Medical staff at the local government hospital were asked to cancel leave, as there was a fear of outbreak of diseases after the water receded. Heavy rain sent boulders hurtling down on the Abu Road-Mount Abu road, 6 km from the entry toll booth. As a result, Mount Abu's contact with the rest of the district was cut off. The road was cleared on Thursday with the help of excavators and stone crackers. Over the weekend, vehicles were moving at a snail's pace at the site of the landslide. Heavy vehicles were asked to stay away as a major crack had developed on the road. The administration has asked travellers to exercise caution in view of the possibility of rocks falling from a height.

Why does it need protection?

Mount Abu is a popular destination, es-

pecially among tourists from Gujarat. More than 30 lakh domestic and international tourists visit the hill station every year. The highest peak is Guru Shikhar, situated 5,650 feet above the sea level. The oldest mountain ranges of Aravalli are home to rivers, lakes, waterfalls and evergreen forests. The forests of Mount Abu were declared a wildlife sanctuary in 1980, covering 290 sq. km of the mountain. It has rich flora and fauna.

It has sub-tropical thorn forests in the foothills and sub-tropical evergreen forests along the water courses and valleys at higher altitudes. A variety of rare and endangered species of animals are found here, and the leopard is the apex predator. As environmentalists describe the unusually high rainfall in Mount Abu as a fallout of global warming, the popular hill station will need to protect its rich vegetation of coniferous trees and flowering shrubs in order to maintain its cool climate.

MOHAMMED IQBAL

The exchange game

Maybe we should learn to admire and celebrate this so-called corruption in all its multi-hued glory



PASSING BITE

RUCHIR JOSHI
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Perhaps we have to start looking at ourselves a bit differently as a nation and a society. As any therapist will tell you, it helps a lot when you lose your delusions about yourself, see yourself in a different light, and start to register and process how other people see you. It's only when you recognise your own problems and patterns that you can start to address them, to move away a bit from the internal distress those tics and traits, that repetitive behaviour, can cause. There is, of course, no 'complete cure' for one's neuroses but there can at least be an attenuation, the reaching of a place from where you can manage and contain the problems.

The economy of power

In this regard, I keep remembering something a friend pointed out many

years ago. Though armed with a cosmopolitan education and a fully internationalised mind, this friend comes from a solidly rural, agricultural area and one day he asked me a simple question: "Why does everybody have a problem with corruption?"

A slightly shocked laugh escaped me. "What? What do you mean? Corruption is bad. It rots our systems. It unfairly props up the rich and powerful. It forces the poor to stay poor, uneducated and subservient."

My friend was unmoved by this series of banalities. "No, I mean why do we even call it corruption? In the village, you trade and barter lots of things outside the official money economy and this thing, what we call corruption, is just our politicians and officials enacting our core nature, which is to trade whatever you have for maximum advantage. So, if you're in a position of power, it's completely natural that you will trade that power for some profit. This is who Indians are. It's in your nature, whether you're a village *hawaladar*, a district collector, a judge in *chhota* court or big court, Chief Minister or Prime Minister. Other societies like tennis or badminton, we're addicted to the thrill of the exchange game."

As I spluttered, my friend carried on,



"And what is this strange notion the British established of corruption being bad? They founded their whole empire on the deepest corruption and then they made it illegal for us to be corrupt? Why? They leveraged what they had to gain an entire subcontinent and then to manage their little *jagir* they changed the rules! Why should we, as an independent country, pay any attention to their false laws and restrictions? We needed to create our own economy of power and we have. Of course it's unfair to the poor but that's the way life is,

everywhere in the world."

The landscape changes depending on where you're standing. The more you change your survey points, the better you understand a terrain. Similarly, when looking at yourself, you need to change your vantage point from time to time. So, it's possible to look at our seventy years of Independence as a series of succeeding corruptions, or, if you like, a series of asymmetrical exchange games between different centres of power.

Maybe we should say to ourselves:

A new mission for Mr. Modi

India's drinking water crisis is nearing flashpoint



ON THE OTHER HAND

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I wouldn't be surprised if Prime Minister Narendra Modi feels that he is running out of things to do at the moment. After all, the economy is ticking along nicely, the Goods and Services Tax (GST) has been rolled out, the Nifty has crossed the 10,000-point mark, Uttar Pradesh is won, Bihar is done and dusted, Rajya Sabha majority is pretty much in the bag and even the Gujarat wobble seems like getting sorted before the next election there. So, what next?

He might want to turn his attention to a problem which tends to get ignored by policymakers and planners in general, and disappears from the political radar with the first sign of good rains – water.

The problem is underfoot, literally, and hence out of mind. India is running out of water resources – principally groundwater resources – at an alarming rate. According to a recent study by the American Geophysical Union, the upper Ganges basin – home to more than half of India's population – could run out of groundwater resources by 2050.

Wastage of rainwater

It is not as if this is because India doesn't get enough rain. India's average annual rainfall is over 1,100 mm. But studies estimate that of the total available water, more than a quarter is lost to just evaporation and run-off losses. Less than a fifth of the rainwater actually gets used – nearly half simply flows out to the sea. The infrastructure to trap and conserve this rainwater either doesn't exist or is so poorly maintained that capacities are usually a third to a half more than what is actually available.

With growing urbanisation putting an ever-increasing pressure on the already creaky infrastructure, the



problem is fast getting out of hand. According to statistics tabled by the Urban Development Ministry, in India's six largest cities, water supply ranges from a low of half an hour per day in Hyderabad to a high of nine hours per day in Kolkata. But due to ramshackle infrastructure, most of this is lost in leakage. Consumption is still pretty low – averaging between 78 to 116 litres per capita per day. At least 22 of India's 32 biggest cities face acute water shortage, with Jamshepur, with a demand-supply gap of 70%, being the worst hit.

With civic administrations failing to deliver, private enterprise has stepped in. Tanker supply has taken the place of piped water supply. And since almost all of this tanker water is tapped from groundwater sources, this has meant tremendous strain on groundwater resources. India extracts an estimated 257 cubic km of water from the ground every year – more than the U.S. and China combined.

In peri-urban India, this has meant an alarming drop in water tables. In south India, which has perennially battled weak monsoons and consequent water shortages, an explosion of groundwater extraction has driven the water deeper into the ground, with nearly 30% of available groundwater accessible only at depths of more than 60 metres. In Chennai, for instance, where over 100 million litres of water per day is sourced by the Chennai Metropolitan Water Supply Board, the

city's water utility, from farms and deep borewells, this is leading to rising conflict between urban and peri-urban and rural populations over water, with farmers from areas surrounding Chennai taking to the streets in protest.

Meanwhile, policies lag behind by decades. The biggest thrust of governments remains on developing surface irrigation infrastructure, despite the known inefficiencies of this system. In unlined irrigation canals, the loss through seepage and evaporation is 40% – and this is before the water even reaches the field. And, in the field, most Indian farmers still prefer traditional watering systems of full flooding or border or furrow flooding, where another 40% of the water gets lost. In fact, though India nominally uses 83% of available water for irrigation and only 5% for domestic consumption, infrastructure issues and usage inefficiencies mean that both urban and rural water consumers face acute shortages, and see each other as the villains.

Rainwater harvesting

The solution is simple. We need a two-pronged approach to solving our water crisis. One, we need to change our focus away from building more inefficient large dams and wasteful irrigation projects and towards conserving the rainfall bounty we get through rainwater harvesting techniques.

Two, we need to improve efficiencies in agriculture. A mere 10% improvement in irrigation efficiency can solve the drinking water problem of our cities. And the technology is already available. Micro and drip irrigation, with the help of sensor-based technologies, can raise efficiency in water usage to up to 90%. Along with this, we need to rationalise water pricing. Water is badly mispriced in India, with neither the agricultural, industrial or urban consumers paying anything like a realistic price for water.

This is where the Prime Minister comes into the picture. Only he has the ability to sell a grand vision, the political muscle to cut through differences between the Centre and the States and the focus to actually deliver outcomes in a finite time frame. And this needs to be done in mission mode. Now.

All lined up on the shelf

How you organise your books is both a deception and a revelation



WORD COUNTS

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With summer drawing to a close, and holiday reading hopefully done, an item on most to-do lists is likely to be organising (or reorganising) our bookshelves, perhaps even whittling down our collections to fit on our limited shelf space. And since most of us hopefully are not given to tidying guru Marie Kondo's drill, the reorganisation amounts to revisiting vital questions about our reading selves.

For the record, here's Kondo's diktat from her bestselling *The Life-Changing Magic of Tidying Up*: put all your books on the floor, pick up each in your hands one by one, and see "whether or not it gives you a thrill of pleasure when you touch it", and thereupon decide whether you want to keep it or not. I don't mean to be judgmental, but I don't know any reader who would find this remotely convincing.

Composing one's self

A more useful, and enormously thought-provoking, guide is *Unpacking My Library: Writers and Their Books* by Leah Price, a professor of English literature at Harvard. "To compose a bookshelf is to compose a self," she writes in the introduction, and seeks out 13 writers to tease out clues about the self they expose through the organisation of their bookshelves. The result, captured along with lavish photographs in this 2011 publication, is an invitation variously to pry voyeuristically into these writers' shelf space, to form a profile of their deliberative selves, and to pick up lines of questioning to interrogate ourselves.

For instance, she asks the writer and critic Lev Grossman, "What proportion of the books that you read do you own – and what proportion of the books that you own have you read?" He doesn't keep books that he knows



he will never read, he tells her, while reckoning he's read a "high proportion" of the books he does have. Novelist Junot Diaz, however, sets the bar rather more high. Everything he owns, he says, will eventually be read, adding: "But naturally I buy more than I can read, so there is always a hundred-book margin between what I own and what I've read. What is cool is that I've caught up a couple of times..."

Which books on his shelves has he not allowed her to photograph, Price asks James Wood, novelist and book critic at *The New Yorker*. "I have a separate bookshelf for 'unread books I want to read sometime soon,'" he replies, touching on the guilt many of us have that makes us hoard unread books in unseeable spaces.

On a dilemma most readers or book owners have, he preaches a "generous selfishness": do not lend a book to a friend, just give it, as "you will never get it back". And, on another question that divides readers, he owns up not just to writing extensively in his books but also to dog-eating. Grossman may cite his book-reviewing commitments while admitting to scribbling even in first editions, but Wood says he writes notes, to-do lists, emails and phone numbers in the endpapers.

His wife, Claire Messud, whose novels include *The Emperor's Children*, is more ambivalent about owning books, likening her tendency in midlife to accumulate books to the smoker's two-packs-a-day habit, one that is best

broken for one's well-being. She says: "At one time, collecting books that were my own, feeling I had my own intellectual and literary trajectory visible before me, seemed necessary and meaningful." While sorting through one's books and reading lists, this is an appraisal readers often forget about, to examine the arc of one's life so far and identify the stretches when reading has mattered inordinately more.

With novelist Gary Shteyngart, Price brings up another subject that divides readers: the smell of books. Shteyngart is "big on sniffing books", saying the old Soviet ones remind him of "tomato soup in a cheap Soviet cafeteria". (He was born in Leningrad.)

There is, of course, a faint suspicion of being witness to a well-considered performance as these writers run through their organising principles for their libraries, their rough-and-ready tips on giving, receiving, lending books, their neat lists of their top 10 books, their capsules of their reading evolution. Ask a friend or the next person at the checkout desk at your library about any of this, and chances are the answer will not come in such a coherent whole. But then that is the biggest deception, isn't it, to think that one's reading self can be so cohesively profiled? So, as Kondo suggests, do put all your books on the floor – but only to place them right back on the shelves to find not how each gives you a thrill, but how the process of reassembling helps you know yourself a bit more.

Taking it in one's stride

Maybe we should be coaching our children in this art, pointing out the U-turns of our leaders with gasps of pleasure the way other societies point to great footballers changing direction and dribbling past opponents. Maybe we should learn to recognise and love the fact that we are a nation of conniving, duplicitous, double-dealing, back-stabbing, principle-free, ethics-*mukt* liars.

Living independently, the Thoreau way

The 19th century writer was an archetype of what humans could aspire to be if we had the conviction to live life on our own terms



SERENDIPITIES

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On July 4, 1845, a 27-year-old Henry David Thoreau moved into a cabin near a lake called Walden Pond in Massachusetts, north-eastern United States. His goal, he wrote later, was "to live deliberately, to [con]front only the essential facts of life". We learn of these and other words that speak of Thoreau's intentions from the writings he left behind. His journals tracked his life from October 1837 to November 1861, eventually filling up 47 manuscript volumes.

The most famous of his books was *Walden; or, Life in the Woods*, an assemblage of sustained thinking about life in a rural setting, deeply felt psychological insights amidst everyday life and some sharp criticisms of the society around him. All of these are sketched

out in an artful prose that is extraordinary in its attention to the sensuousness and specificities of reality. As a book that has survived generations, *Walden* lives on in the cathedrals of American literary consciousness as a sort of moonlit gargoyle, tucked away, sitting vigil over modernity and its discontents.

200th birth anniversary

In July 2017, as the politics of neo-nationalisms and hyper-patriotisms froths manically, America has begun to celebrate Thoreau's bicentennial birth anniversary. For many, this is a moment of discovery. His words reveal – and not just to Americans – that it is possible to be a loving son or daughter of a nation, to be in thrall of its wilds and rivers and in admiration of its collective intelligence and spirit, and yet deny the strictures of convenient patriotisms. They also discover that more than his efforts to critique a society, it was his willingness to declare himself independent from social expectations, to live unburdened by convention, which made him a secular saint.

Today, Thoreau is known far and wide across America. But this know-



ledge is hazy and is almost reluctantly remembered, much in the manner one remembers a long-forgotten cat that returns every now and then to mew in the attic of American intellectual life.

Reading him in the month of his 200th birth anniversary, one can see what has attracted generations of readers and thinkers towards him. Thoreau

emerges in our eyes as an archetype of independent thinking, a way to be free if only we had the strength and conviction to live life on our own terms.

Schools with progressive curricula now teach their students excerpts from *Walden*. Whether high schoolers see in his life a quest for authentic living or merely self-indulgence is hard to tell. Over the past 200 years, however, not everybody has been welcoming of Thoreau or his influence. In early 20th century, the great jurist Oliver Wendell Holmes offered his curmudgeonly assessment that Thoreau was "[a] nullifier of civilization, who insisted on nibbling his asparagus at the wrong end". In the 1950s, Senator Joseph McCarthy, who wasn't averse to seeing windmills for dragons, got a textbook of American literature proscribed from government-funded libraries because it contained Thoreau's essay on civil disobedience. The children, the Senator presumably feared, might learn to defy family, society and government in the name of their conscience. Today, it is fashionable in many quarters to indict Thoreau as a humourless misanthrope whose mother supposedly did his laundry!

Few took Thoreau's fierce commitments with an unyielding earnestness as much as Mahatma Gandhi did. As per Gandhi, Thoreau's 'civil disobedience' "contained the essence of his political philosophy" A few decades later, Martin Luther King Jr. summarised Thoreau's ideas on civil disobedience even more succinctly: "The basic aim was to refuse to cooperate with an evil system."

These history-changing admirers and students of his words notwithstanding, Thoreau's loci of investigation, the site of transformative possibilities, remained the individual. Society, unlike for his contemporary Karl Marx, mattered to Thoreau only insofar as it could be used as a tool to aid the individual's fullness of being. To this end, Thoreau's life was dedicated towards improving his own mind and morals.

He did so by the studying an astonishing variety of books, through an investigation of nature around him, and by understanding his own ethical commitments. All three aspects took inspiration from the religious literatures of the East, particularly India. Thanks to his neighbour and friend, the great writer Ralph Waldo Emerson, Thoreau discovered

the *Bhagavad Gita* and *Samkhya Karika*. These texts prodded an already sensitive young man towards a contemplative and observation-filled way of living.

Thoreau's willingness to see himself as a devotee of Nature's omnipotence led him to oppose two key forces of his times: one, the expansionist instincts of America's nascent industrial powers, and two, the overbearing omnipresence of the Christian church. The former led him to till the soil for the saplings of the anti-capitalist, deep-ecology movements that would sprout nearly a century later with Rachel Carson. As for the Church and its claims, Thoreau had little use for it.

Nature was the one true God he worshipped and his own writings and sweat in its service were one true offering. Thoreau's life was dedicated to discovering the world as it truly was – a world of sensations and sentiments shorn of ornament, machines, or even history. He, like the rest of us, probably didn't succeed. But, his efforts teach us that if we wish to witness this unconcealment, a small hut by a lake can contain the world itself. We only need to learn to see it.

CAPSULE



Diet and gut biota

New studies reveal the gut bacteria composition of the common fruit fly (*Drosophila melanogaster*) has a significant effect on diet choice and reproductive success, and its influence can be carried down to the next generation — with potential implications for human health.



Viral or bacterial

Scientists identified 11 genetic markers in blood that accurately distinguished between viral and bacterial infections 80-90% of the time. The finding is important because until now physicians did not have a good way to confirm bacterial infections and by default prescribe antibiotics.



Markers of longevity

The answer to how long each of us will live is partly encoded in our genome. Researchers have identified 16 genetic markers associated with a decreased lifespan. About 10% of the population carries some configurations of these markers that shorten their life by over a year compared with the population average.



Adhesive for healing

A super-strong 'tough adhesive' has been created that is non-toxic and binds to biological tissues with a strength comparable to the body's own resilient cartilage, even when they're wet. Inspired by the glue produced by a slug, the double-layered hydrogel material will have a variety of applications.



Milky Way's origins

Up to half of the matter in our Milky Way galaxy may come from distant galaxies, astrophysicists have discovered in a first-of-its-kind analysis. Each one of us may be made in part from extragalactic matter. Supercomputer simulations, found an unexpected mode for how galaxies acquired matter: intergalactic transfer.

ODD & END

Crops' new way of killing pests

As chemical pesticides raise concerns over insect resistance, collateral environmental damage, and human exposure risks, transgenic methods are becoming an attractive option for future pest control. Plants are among many eukaryotes that can 'turn off' one or more of their genes by using a process called RNA interference to block protein translation. Researchers are now weaponising this by engineering crops to produce specific RNA fragments that, upon ingestion by insects, initiate RNA interference to shut down a target gene essential for life or reproduction, killing or sterilising the insects. RNA interference adds another degree of subtlety, by instead shutting down essential genes in pests that consume crops.

IGIB researchers rein in cancer cells

Controlling the level of telomerase can probably prevent cancer metastasis

R. PRASAD

Researchers at Delhi's CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) have found the mechanism by which controlling the levels of telomerase can help in reining in the growth of cancer cells and probably prevent cancer metastasis. The results were published in the *Journal of Biological Chemistry*.

Unlike normal cells, most cancer cells have high levels of telomerase and this leads to more than normal length of the telomere. Telomeres protect chromosome ends somewhat like the plastic clips at the end of shoelaces that prevent fraying of the ends. While cells die when the telomere becomes shorter beyond a certain limit, in the case of cancer cells the length of the telomere is maintained thereby ensuring extended life span of the cells.

In normal cells the telomerase is kept under tight control. But in about 85% of all cancers the telomerase levels are more than normal leading to malignant transformation and aggressive metastasis in many cases. "It is not clearly understood how telomerase is kept under tight control in normal cells and how the telomerase levels gets increased in cancerous cells," says Dr. Shantanu Chowdhury from the Genomics and Molecular Medicine Unit at IGIB and the corresponding author of the paper.

It is already known that when the amount of a particular protein that suppresses the spread of cancer (metastasis) called nonmetastatic 2 (NME2) is high the tendency of the cancer to spread is low. But what came as a surprise is the role of this protein in controlling the telomerase levels as well. "How NME2 controls



Proteomics approach: Ankita Singh (seated) and Dr Shantanu Chowdhury worked with Dhurjoti Saha (right) to discover the mechanism controlling the production of telomerase. *SPECIAL ARRANGEMENT

metastasis is not clearly understood. But surprisingly we found that NME2 controls the levels of telomerase," Dr. Chowdhury says.

The mechanism

The researchers found that NME2 binds to a DNA structure (G-quadruplex) found in the telomerase promoter. Once bound, the NME2 facilitates a well known suppressor of gene expression (REST complex) to bind to the telomerase promoter and control the production of telomerase.

"Experiments show that if you don't have NME2 then the REST suppressor cannot bind to the telomerase promoter and control the production of telomerase," says Dhurjoti Saha from IGIB and one of

the first authors of the paper.

"We used proteomics approach to study the protein-protein interactions. We could identify protein members of the REST complex that interact with NME2. The IGIB team then confirmed the role of the REST complex and its function," says Dr. Ramesh Ummanni, from the Centre for Chemical Biology at the CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad and a co-author of the paper.

Drug target

"We established that the DNA structure (G-quadruplex) could be a possible drug target once we understood the mechanism of NME2 binding to the promoter followed by the REST suppressor complex," Dr. Chowdhury says. The involvement of



a DNA structural architecture allowed the team to use small molecules that recognised the specific structure.

Since the amount of NME2 is low in many metastatic cancerous cells, the researchers used small molecules that were able to function like NME2 by recognising and binding to the DNA structure. "We screened 20 molecules and 11 were able to bring down the telomerase level in fibrosarcoma cancer cells," Dr. Chowdhury says.

Based on the initial lead from the small molecules, the researchers are planning to synthesise new molecules to optimise for drug-like characteristics for therapeutic use. The molecules will then be tested on animals.

Scooping out oil spills made easy by IISER Thiruvananthapuram

No solvent is required for spraying the gelator and hence it is environment friendly

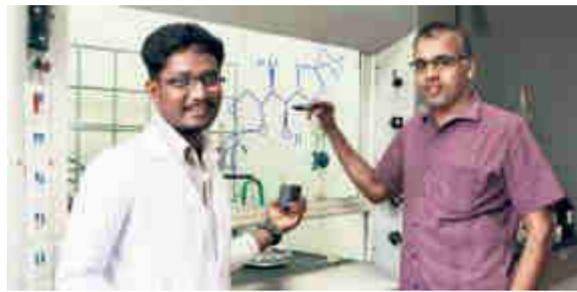
R. PRASAD

More efficient and quick absorption of crude oil from the sea following marine spill has now become possible thanks to scientists from the Indian Institute of Science, Education and Research (IISER) in Thiruvananthapuram who have developed a hydrophobic sorbent that can suck up oil and congeal it. A hydrophobic material automatically becomes oil-loving and takes up oil when it comes in contact with it. The results were published in the journal *Angewandte Chemie*.

Hydrophobic sorbent

A two-member research team led by Prof. Kana M. Sureshan from the School of Chemistry at IISER developed the hydrophobic sorbent by using a cheap raw material (mannitol) and cellulose pulp as a matrix. Mannitol was converted into a hydrophobic gelator through a one-step process and a solution was made using this compound. Cellulose balls the size of marbles were then dipped in the solution and dried.

"The gelator gets adsorbed on the cellulose fibre through hydrogen bonding. This process of adsorption



Quick removal: "It takes only from 30 minutes to two hours from the time of application to scooping out the rigid fibre balls containing congealed oil," says Kana Sureshan (right) *SPECIAL ARRANGEMENT

of gelator on the cellulose fibre matrix changes the cellulose matrix from being very hydrophilic (water-loving) to hydrophobic (water repelling)," says Prof. Sureshan. A hydrophobic material naturally becomes oleophilic (oil-loving).

Unlike other alternatives, the sorbent can be easily applied over oil-water mixture, and no solvent is needed for spraying the gelator thus making it environmental benign. The gelator adsorbed on the surface of cellulose

fibre is able to absorb oil when it comes in contact with it.

"Once the sorbent sucks the oil, the gelator slowly gets released from the cellulose fibre and congealing of oil takes place," Prof. Sureshan says. Only when the oil congeals can it be removed without the oil dripping due to gravity.

Congealing of oil becomes possible as the gelator used by the team self-assembles to form micro fibres and the oil loses its fluidity and gets

trapped within the entangled fibrous network to form a rigid gel. Gelation essentially turns the liquid oil phase into a semi-solid one and this allows the fibre balls with the congealed oil to be simply scooped out or removed using a scoop or a sieve.

"It takes only about 30 minutes to two hours from the time of application to scooping out the rigid fibre balls containing congealed oil, leaving behind clean water. Since crude oil spreads quickly in the sea after a spill, it is necessary to quickly remove the oil from water," Prof. Sureshan says.

The team tested the ability of their sorbent to congeal oil using six different crude oils, including the one from Bombay High.

Irrespective of the different viscosities of the six crude oils tested, the sorbent was able to absorb the oil and the rigid globules could be scooped out in 30 minutes to two hours.

Studies found that the sorbent was able to absorb and congeal 16 times its own weight of oil. The absorbed oil can be recovered by applying pressure or fractionated by a simple distillation process.

A device to test infants' field of vision

Accurate quantification now possible

ASWATHI PACHA

An advanced device to measure the field of vision of infants has been developed by scientists at L.V. Prasad Eye Institute, Hyderabad. The device, named pediatric perimeter, can be used to test the eyesight of infants between two and 12 months. Currently, there is no specific perimeter device to measure the field of vision in infants. As a result, most of the eye defects arising during infancy get detected only in adulthood.

The pediatric perimeter helps to measure the area of vision and also the reaction time of infants. The innovation was recently published in *Translational Vision Science and Technology*.

Most doctors and optometrists use a crude way of assessing visual fields by bringing bright toys from the side of the eye to the centre and see if the infant is attracted.

While there is no accurate quantification when such methods are employed, the use of pediatric perimeter addresses this shortcoming. Besides infants, the device can also be used on patients with special needs where testing using conventional perimeters is not possible.

Testing method

The device consists of a hemispherical dome fitted with LEDs in all directions which are controlled using a computer program. The infant is placed inside the dome in the lying down position. The baby's eye and head movements when the LED is switched on randomly are monitored by an infrared camera mounted

on the top of the dome. The test takes only 6-10 minutes. The reaction time (time taken for the infant to look at the LED after it is switched on) measured helps identifying infants with developmental delay — healthy infants react within 380 milliseconds and those with developmental delay took 663 milliseconds.

To measure the area of vision, the LED was switched along the dome starting from the left and right sides to the centre, and also from front to back. The infants gaze was monitored by the camera and the degree of eye movements along with the reaction time was calculated to identify visual field defects. Many neurological factors can cause impairments in the vision of an infant.

The device was validated using adults with normal vision and those with glaucoma and retinal defects.

"The device is the result of collaborative effort of optometrists, ophthalmologists, engineers and designers from all over the world at Srujana Center for Innovation at the institute," says Mr. Koteswararao Chilakala, Embedded Systems Engineer from the Srujana Centre for Innovation at L.V. Prasad Eye Institute, Hyderabad in an e-mail to *The Hindu*.

"Few patients with squint eye realise their visual field defect only when they come for cosmetic correction. It is therefore essential to test infants and address their visual defects as early as possible," explains Dr. PremNandhini Satgunam, Associate Research Optometrist at L.V. Prasad Eye Institute, Hyderabad.

Tackling obesity in mice

PRESS TRUST OF INDIA

A study published in *Cell* identified two new populations of cells in the brain that regulate appetite and may help develop drugs to treat obesity by controlling hunger signals.

Researchers located through whole-brain imaging, the two types of cells in a part of the brainstem called the dorsal raphe nucleus (DRN) that becomes activated in hungry mice.

Subsequent imaging of other mice that were fed more than their normal amount of food, until they were full, revealed a different pattern of DRN activity. These results indicated that neurons in that part of the brain played a role in feeding behaviour.

They then determined which of the neurons were involved.

Genetic analysis of the activated cells showed that the neurons triggered by a full belly released glutamate, while the neurons triggered by hunger released a different neurotransmitter, known as GABA.

Researchers were able to turn on the glutamate-releasing cells in obese mice. This suppressed the animals' food intake and made them lose weight. It also confirmed that the DRN neurons turned on by hunger did indeed drive food intake.

Similarly, flipping on the GABA-releasing neurons in the same part of the brain had the opposite effect and increased food intake.

Turning on the "hunger neurons" automatically turned off the "satiety neurons," maximising the effect, researchers said.

J.D. Hooker, Indian plants and the unexplored Himalayas

We should pause and reflect on the current status of the documentation of India's amazing plant wealth

KAMAL BAWA
R. GANESAN

Sir Joseph Dalton Hooker, one of the greatest explorers of the nineteenth century, and the closest friend of Charles Darwin, was 32 years old when, in 1849, he visited the then remote kingdom of Sikkim in the Eastern Himalaya. Over a two-year period, he travelled widely in the Darjeeling-Sikkim Himalaya and described over 3,000 species of plants for the tiny state of Sikkim, 7,096 square kilometre in size.

After Hooker returned to England he went on to write, over a 25-year period, the seven-volume *Flora of the British India*—the first and still the only authoritative account of the plants of the vast sub-continent. June 30, this year, marked Hooker's 200th birth anniversary.

While celebrating the bicentenary of Hooker's birth and his enormous contribution to the documentation of biodiversity in one of the hottest global hotspots of biodiversity, we should pause and reflect on the current status of the documentation of India's amazing plant wealth, the pace of global environmental change that is impacting this plant wealth, and the prospects for sustainability in the Himalaya, particularly the Eastern Himalaya, where Hooker conducted his most notable studies that led to the compilation of the flora of a vast region.

It is questionable if the pace of cataloguing life in India or South Asia has advanced very much since Hooker's time. The descriptions of many plant genera on which Hooker worked still remain incom-

plete. Hooker, for example, wrote to Charles Darwin about the taxonomic status of *Impatiens*: "I took down the most difficult genus of Indian plants I could think of to work at—viz. *Impatiens* of which there are just 100 Indian species! I have made the first draft of a monograph of them..." (J.D. Hooker to Charles Darwin, December 2, 1857: <https://cudl.lib.cam.ac.uk/view/MS-DAR-00104-00178/3>). Since the pioneering work of Hooker, species of *Impatiens* from the entire Himalaya or India have not been fully catalogued.

Hooker's exploration of the Indian sub-continent was very limited. He could visit only a small part of the huge sub-continent. In present-day India alone, the genus *Impatiens*, for example, is now known to contain more than twice the 100 or so species estimated by Hooker: the British India at the time of Hooker included Pakistan, Bangladesh and Myanmar. New species of *Impatiens* from the Himalaya are being described every now and then. Thus, further work is necessary to fully document India's incredible diversity of plants, especially from the unexplored regions of the Eastern Himalaya.

Stupendous effort

It is interesting that Hooker single-handedly organised the effort to write the flora of a sub-continent, extraordinarily rich in species. British India at Hooker's time perhaps had more than 25,000 species of flowering plants. Hooker described about 16,000 of these species. With modern digital and other tools, and a sound



Diversity: In present-day India alone, the genus *Impatiens*, for example, is known to contain more than twice the 100 or so species estimated by Hooker. *SPECIAL ARRANGEMENT

infrastructure for field work that Hooker could not dream of, Indian scientists have a great opportunity to complete Hooker's unfinished task, and to produce a complete, modern authenticated list of India's plants.

The neglect of plant exploration in India, particularly in the Eastern Himalaya, where Hooker began his professional career, is ironic. The Eastern Himalaya, along with Hengduan Mountains, matches the Andes that include the lowlands of South America, as among the world's richest centres of plant diversity. There are thousands of economically important

species, many such as rhododendrons, orchids, poppies, primroses and, of course, Hooker's balsams (*Impatiens*) of immense horticultural significance. Many species remain to be discovered: despite the lack of systematic exploration, from 1998 to 2014, according to the World Wildlife Fund, India, 375 species of new plants were discovered in the Indian part of the Eastern Himalaya.

Changing landscape

At the same time, the Himalaya is changing rapidly. When Hooker visited Darjeeling and Sikkim, he writes in his *Him-*

alayan Journals that he could see dense forests all around him. These forests now exist as a patchwork of fragments, and are threatened by a host of factors such as expanding populations, infrastructure development (roads and hydropower) and climate change.

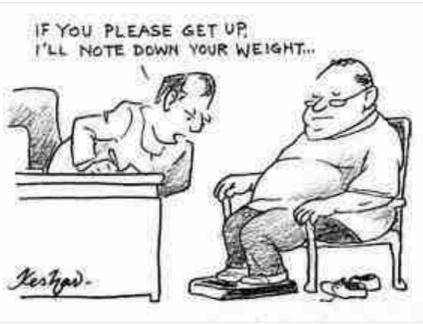
There is thus an urgent need to conserve remaining biodiversity and the associated ecosystem services, particularly in the light of a recent report about the world wide "annihilation" of the biological world, also termed as the sixth mass extinction. Our country, for instance, has lost more than 50% of the populations of many of our large mammals.

This decimation of life is particularly ironic when many species are yet to be discovered, and when the evidence is mounting that nature provides us with a host of economic benefits that we had not thought of before. Take for example a recent, widely publicised, study that shows that economic flows from six selected tiger reserves range from US\$128 million to US\$271 million per year.

A commitment to fully document the richness and the value of life in the Himalaya for the benefit of our society might be the best way to celebrate the birth anniversary of one of the greatest plant explorers of the world.

Kamal Bawa is Distinguished Professor of Biology at the University of Massachusetts, Boston and the President of the Bengaluru-based Ashoka Trust for Research in Ecology and the Environment (ATREE). R Ganesan is a Fellow at ATREE. The views expressed are their own.

DR HUMERUS KESHAV



AROUND THE WORLD

Ankle supports to help stroke patients

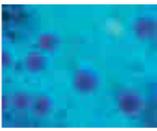
Scientists have created lightweight and low-profile soft robotic ankle supports that could help stroke patients walk with less difficulty and more normal strides, says a report in *Science Translational Medicine*. Recent advances in robotic technologies have shown promise for walking rehabilitation, but most assistive exo-suits are rigid, bulky contraptions that are impractical for people to wear during everyday activities. The newly-developed soft, robotic ankle-support system that's twice as heavy as a soccer ball is to be worn on one side of the body. Over two days of testing, all nine subjects — ranging from 30 to 67 years old who were undergoing rehabilitation after strokes — showed more efficient and less asymmetrical strides when wearing the device, both when walking tethered on a treadmill and over open ground.

GETTY IMAGES/ISTOCKPHOTO

Engineered stem cells that sense tissue stiffness can "feel out" metastatic tumours and deliver cancer-killing drugs, scientists report in *Science Advances*. Their findings could someday pave the way to more effective clinical interventions for patients whose cancers have metastasised. More than 90% of all cancer deaths are due to metastases, and no effective treatments exist to directly target tumours that spread to distant sites throughout the body (which are often difficult to detect with clinical imaging technologies and impossible to remove surgically). Evidence is emerging that cancer cells modify their surroundings by cross-linking proteins so that the environment around tumours becomes up to 10 to 15 times more rigid than healthy tissue. To counter this, researchers engineered mesenchymal cells to produce a drug-activating enzyme in response to tissue stiffness so that the cells specifically delivered cytotoxic chemotherapies to metastatic tumour sites.

Armour to fight cancer

Engineered stem cells that sense tissue stiffness can "feel out" metastatic tumours and deliver cancer-killing drugs, scientists report in *Science Advances*. Their findings could someday pave the way to more effective clinical interventions for patients whose cancers have metastasised. More than 90% of all cancer deaths are due to metastases, and no effective treatments exist to directly target tumours that spread to distant sites throughout the body (which are often difficult to detect with clinical imaging technologies and impossible to remove surgically). Evidence is emerging that cancer cells modify their surroundings by cross-linking proteins so that the environment around tumours becomes up to 10 to 15 times more rigid than healthy tissue. To counter this, researchers engineered mesenchymal cells to produce a drug-activating enzyme in response to tissue stiffness so that the cells specifically delivered cytotoxic chemotherapies to metastatic tumour sites.



GETTY IMAGES/ISTOCKPHOTO

Bugged by thrips? DNA barcoding to the rescue

Scientists have developed a new method to precisely identify a class of plant-sucking pests which affect several commercially important crops. Thrips are tiny plant sucking insects, one to three millimeters in length that cause damage to crops by direct feeding and by transmitting plant viruses. A major obstacle in correct identification is their small size and high degree of similarity at some stages of their life cycle. Now scientists at the Centre for DNA Taxonomy, Zoological Survey of India in Kolkata, have developed a DNA barcoding technique to identify thrips in India and found this technique to be effective. It could be of immense value as thrips cause huge losses to crops. The results have been published in the journal *Scientific Reports*. — India Science Wire



SPECIAL ARRANGEMENT

A path to obesity — poor sleep

Adults in the U.K. who have poor sleep patterns are more likely to be overweight and obese and have poorer metabolic health, according to a study in *PLOS ONE*. The findings showed that people who were sleeping an average of six hours a night had a waist measurement that was 3 cm greater than individuals who were getting nine hours of sleep a night. And shorter sleepers were heavier too. The results strengthen the evidence that insufficient sleep could contribute to the development of metabolic diseases such as diabetes. The study not only looked at the links between sleep duration, diet and weight but also other indicators of overall metabolic health such as blood pressure, blood cholesterol, blood sugar, and thyroid function. The investigation involved 1,615 adults who reported how long they slept and kept records of food intake.



GETTY IMAGES/ISTOCKPHOTO

Tackling childhood cancer with a curcumin formula

Attaching curcumin, a component of the common spice, turmeric, to nanoparticles can be used to target and destroy treatment-resistant neuroblastoma tumour cells, according to a new study published in *Nanoscale*. The study, conducted in partnership by researchers at Nemours Children's Hospital and the University of Central Florida, U.S. demonstrates a potentially novel treatment for neuroblastoma, the most common cancer in infants. Neuroblastomas are cancers that start in early nerve cells and commonly form in the tissue of the adrenal glands, near the kidneys. About 700 new cases of neuroblastoma are diagnosed each year in the U.S. and most cases appear in children younger than 5 years old. Curcumin has been shown to have substantial anti-cancer ability, but its low solubility and poor stability have made its use in medicinal applications challenging — *Science Daily*



GETTY IMAGES/ISTOCKPHOTO

DEMYSTIFYING SCIENCE

What is MUC7?

It is a protein responsible for making saliva sticky and of late, has opened a window into the biological links between early humans and archaic human-like species. Scientists studying the history of the gene that codes for this protein, say that breeding between various human-like species was far more common than supposed. Past studies have concluded that the forebears of modern humans in Asia and Europe interbred with other early hominin species, including Neanderthals and Denisovans. Other than giving spit its slimy consistency, the MUC7 protein binds to microbes helping to rid the body of disease-causing bacteria. Moreover, they stumbled upon a variant of the gene in some Sub-Saharan populations that was so distinctive that it could only have come from a "ghost species", or one for whom no fossils have yet been found. The research was published on July 21 in the journal *Molecular Biology and Evolution* in an article entitled "Archaic Hominin Introgression in Africa Contributes to Functional Salivary MUC7 Genetic Variation". This article describes how University at Buffalo scientists focussed on the MUC7 gene's copy number variable subexon repeats (PTS-repeats), genetic features that in this case affect the size and glycosylation potential of the protein.

A two-in-one solution

Experts call for integrating hepatitis testing and treatment as a component in the national programme for HIV

JYOTI SHELAR

Hepatitis C, a disease that closely mimics the deadly HIV infection, has been ignored for long, say medical experts. The chronic liver infection caused by the blood-borne hepatitis C virus (HCV) kills nearly 96,000 people in India annually. This, despite the fact that the availability of a range of new drugs has drastically improved its cure rate to over 95%.



Still a worry: "The threat of the disease [hepatitis] continues due to the overlapping modes of transmission with HIV." • GETTY IMAGES/ISTOCKPHOTO

Testing for two

Experts also point to the threat of HCV co-infection with HIV, given that both diseases have same routes of transmission. "The need of the hour is to integrate HCV testing and treatment as a component in the already existing national programme for HIV," says Dr. V. Sam Prasad, country manager, AIDS Healthcare Foundation, adding that instead of designing a new programme that may take years, tweaking an existing programme would be simpler and faster. He says just like HIV, that now has a 'test and treat' policy as a part of the Antiretroviral Therapy (ART) guidelines, a revised version could

add a similar approach for HCV. Like HIV, HCV can be transmitted through injectable drug use through the sharing of needles, reuse or inadequate sterilisation of medical equipment such as syringes and needles, and transfusion of unscreened blood and blood products. Though very uncommon, it can also be transmitted sexually and can be passed from an infected mother to her baby. According to Dr. A.R. Pazare, head of the medicine department

at Mumbai's King Edward Memorial (KEM) Hospital, the cure rate of HCV was extremely low till about five years ago as there were merely two drugs to treat it. "But now, as many as 30 new drugs are now available. They have become a game changer for the disease," he says, adding that despite this, the threat of disease continues due to the overlapping modes of transmission with HIV. "We should react quicker to curb it. Also, there is extremely low

awareness about the disease."

Co-infection cases

Approximately 12 million people in India are chronically infected with hepatitis C. Globally, 2.3 million people living HIV are co-infected with HCV of which nearly 1.3 million are injectable drug users. While India lacks data on co-infections, rough estimates state that 60,000 people with HIV also have HCV. "It is highly impossible that these estimates are accurate," says Dr. Prasad, adding that the disease often presents no symptoms and hence is diagnosed very late. "In most cases, liver cirrhosis or fibrosis sets in by then," he says, adding that 20% of the patients are unaware of their status.

A 2010 article published in the *Indian Journal of Sexually Transmitted Diseases* cited the results of a study carried out in the Department of Microbiology, Nair Hospital, Mumbai to track the co-infections of HIV with hepatitis B virus (HBV) and HCV. Of the 540 HIV seropositive patients, 90 (16.7%) were positive for HBV and 7 (1.3%) were positive for HCV antibodies. While heterosexual high-risk beha-

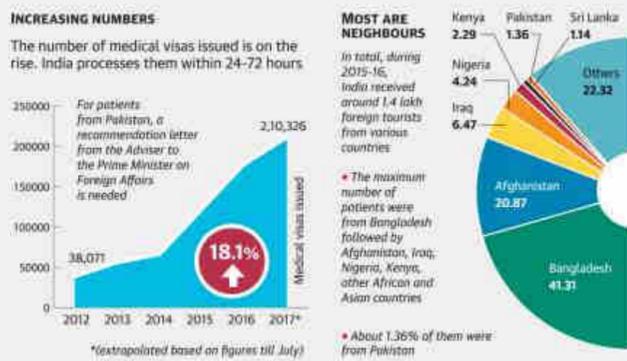
viour was observed in 435 (80.6%) patients, 15 (2.8%) patients had a history of blood transfusion. Two patients (0.4%) who were intravenous drug users were positive for HIV, HBV and HCV. The article lay emphasis on the necessity of integrating HIV and HBV/HCV care into the National AIDS Control Programme and commence interventions and treatment guidelines for patients with HIV and HBV/HCV co-infection.

A study published last year in *The Lancet* too stated that not only are people with HIV at much higher risk of HCV infection, groups such as people who inject drugs have an extremely high prevalence of HCV infection — over 80%. "There is a need to scale-up routine testing to diagnose HCV infection in HIV programmes worldwide, especially among high-risk groups, as the first step towards accessing the new, highly curative HCV treatments," said an official of the World Health Organization, which had commissioned the study.

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A visa to good health

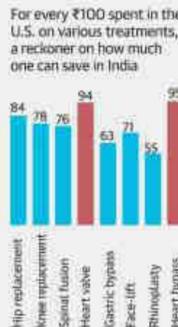
India is gradually transforming itself into a medical tourism hub but taking informed policy decisions to improve the prospects of the sector has become difficult due to poor data collection. These numbers are based on a survey conducted by the Directorate General of Commercial Intelligence and Statistics, where around 435 enterprises were covered between June 2016 and March 2017



GROWTH PROSPECTS



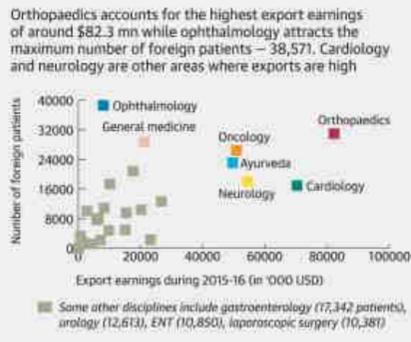
LOW EXPENSES A DRAW



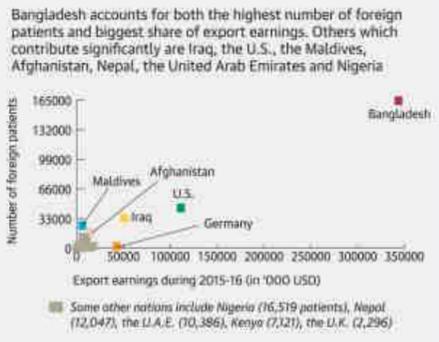
POOR DATA COLLECTION

- Lack of data comes in the way of capturing trends in the export of health services. Some of the issues involved are:
- No business directory for health service providers
 - NRIs sometimes provide a local address as medical charges for Indians are lower
 - Hospitals may not inquire about a patient's origin during admission
 - In the absence of portability of insurance, patients may not declare their country of origin
 - Incorrect visa information may lead to under-reporting
 - Patients from countries such as Nepal may not require a visa

WHAT DO THEY COME FOR?



COUNTRY OF ORIGIN?



Sources: Export of Health Services: A Primary Survey in India

Data compiled by Vignesh Radhakrishnan | Graphic by Karthick S.T.

England's mental health experiment

Sparks global interest in its goal of a primary care system for all of Britain

BENEDICT CAREY

England is in the midst of a unique national experiment, the world's most ambitious effort to treat depression, anxiety and other common mental illnesses.

The rapidly growing initiative, which has got little publicity outside the country, offers virtually open-ended talk therapy free of charge at clinics throughout the country: in remote farming villages, industrial suburbs, isolated immigrant communities and high-end enclaves. The goal is to eventually create a system of primary care for mental health not just for England but for all of Britain. At a time when many nations are debating large-scale reforms to mental health care, researchers and policymakers are looking hard at England's experience, sizing up both its popularity and its limitations. Mental health-care systems vary widely across the Western world, but none has gone nearly so far to provide open-ended access to talk therapies backed by hard evidence. Experts say the English programme is the first broad real-world test of treat-



GETTY IMAGES/ISTOCKPHOTO

clinical director for mental health for the National Health Service. "You'd never, ever hear people in this country say that out in public before."

A recent widely shared video of three popular royals — Prince William, Prince Harry and Kate, Duchess of Cambridge — discussing the importance of mental health care and the princes' struggles after their mother's death is another sign of the country's growing openness about treatment.

What data shows

The enormous amount of data collected through the programme has shown the importance of a quick response after a person's initial call and of a triage-like screening system in deciding a course of treatment. It will potentially help researchers and policymakers around the world to determine which reforms can work — and which most likely will not. "It's not just that they're enhancing access to care, but that they're accountable for the care that's delivered," said Karen Cohen, chief executive of the Canadian Psychological As-

sociation, which has been advocating a similar system in Canada. "That is what makes the effort so innovative and extraordinary."

The programme began in 2008, with \$40 million from Gordon Brown's Labour government. It set up 35 clinics covering about one-fifth of England and trained 1,000 working therapists, social workers, graduates in psychology and others.

The programme has continued to expand through three governments, both ideologically left and right leaning, with a current budget of about \$500 million that is expected to double over the coming few years.

Patients also do simple, real-world experiments, to see if feared consequences materialise.

The biggest challenges may be those created by runaway demand. Therapists are booked solid; some are juggling 25 clients at a time, and the line to get in the door is long, creating the same complaints about waiting lists that the National Health Service has for many medical services and procedures. NPT

A lonely and tough fight

RYAN WHITE

In the summer of 2016, I was admitted to a private hospital for a minor surgery. The nurse had come twice in the night to draw my blood, and said there was a 'problem' with the earlier samples. Next morning, the doctor revealed that I had been tested positive for HIV (Human Immunodeficiency Virus) and the hospital would not be able to conduct the operation. I was quietly shifted out of the ward with a summary comment on my discharge slip — "referred to AIIMS for ART treatment".

After multiple rounds of tests, it was established that I had HIV. For the treatment, I had to choose between a private or public health-care provider. In India, government hospitals offer standardised treatment, in line with global protocol. Government hospitals also have the best doctors and are the first to update medical procedures. Further, government hospitals offered free medicines and advice, which in the case of a private hospital would have been prohibitively expensive. With this in mind, I decided to go to All India Institute of Medical Sciences (AIIMS), India's premier medical facility.

Importance of ART

The protocol for HIV treatment is global and standard. Once you have tested positive, the first thing doctors need to know is your CD4 cell count. CD4 cells are white blood cells that fight infection. So, HIV kills CD4 cells and hence its "count" is a measure of the spread of the virus. If the CD4 count is less than 200, then HIV has advanced to what we call full-blown AIDS.

To suppress and ultimately halt the virus, antiretrovirals, a cocktail of drugs, are employed. Although a cure for HIV has not yet been discovered, correct and timely adherence of antiretroviral therapy (ART) halts the virus, enhancing longevity and reducing chances of transmitting HIV to their partners.



GETTY IMAGES

Negotiating a maze

However, this straightforward treatment becomes convoluted in the Indian public health-care system. AIIMS is an extraordinary public health-care delivery institution endowed with both resources and talent. Yet, a continual stream of patients, a lack of protocol and unwelcoming staff make it one of the most difficult places to negotiate.

The HIV testing laboratory at AIIMS is one of the 13 laboratories accredited as a national research laboratory (NRL) — making it one of the best in the field. The laboratory denied me tests on two of the three occasions citing "machine failure". On being denied the test for the second time, I researched and found that the 120-page "National Guidelines for HIV Testing", published by the National Aids Control Organisation (NACO), details every step and protocol for the lab. Recommendations include ensuring privacy in the counselling and collection rooms, displaying the list of tests done in the laboratory and turnaround time. At India's premier medical institution, HIV patients find that none of these steps is followed.

A 2015 study from two ART clinics in Uttar Pradesh said that out-of-pocket expenditure was "high and even catastrophic" for about a fifth of HIV/AIDS-affected households. An older study from 2007 said that people on ART spent five times more on out-of-pocket expenses than those not on ART. In most government hospitals, care is free but comes with its set of insufferable delays and constraints.

Let down

A step has been taken with the passing of the HIV and AIDS (Prevention and Control) Bill, 2017 but even after two months, one of the many important decisions of the Bill — the provision of insurance for HIV+ patients — has not been implemented. An absence of insurance cover against minor opportunistic infections would mean patients would be forced to go to already stressed government hospitals and get second-grade care because the pool of private health-care providers remains small and beyond the reach of most patients. Over the years, I have realised that there are no champions for HIV-affected people in India. Parliament, the judiciary, civil society including media and public personalities — pillars which should spearhead this movement — are missing. Given proper health care and timely assessment, HIV-positive patients have an equal life expectancy as HIV-negative patients.

Ryan White, and a pseudonym, is a patient-activist