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WHO

Smriti Mandhana, Pulling off a class act

After two blistering knocks in the early stages of the ongoing ICC Women's Cricket World Cup in England, left-handed opening bat Smriti Mandhana grabbed most of the headlines. Her 72-ball 90 helped India floor England, host and favourites, in the opening match on June 24, and she followed this up with an elegant, unbeaten, match-winning 106 against the West Indies.

The 20-year-old's attacking style, marked by delightful drives and punishing pulls, has ushered in a new wave of fans to the often forgotten world of women's cricket.

Where are her cricket roots?

Born in Mumbai in 1996, Mandhana's family moved to Sangli in Maharashtra when she was two years old. She developed a keen interest in the sport after watching her elder brother, Shравan, showcase his skills for the Sangli district and State junior teams. When she was 12, Mandhana's father approached Anant Tambwekar, a private coach, to train her. Tambwekar was happy to take Mandhana under his

wing. Her father knew Tambwekar well, because he was the coach of the Sangli under-16 team, which Shравan had played for.

"He asked me if I would train Smriti and I agreed. There were a few people who didn't think much of a girl playing cricket, but I was not bothered by this sort of negativity," Tambwekar recalls. The duo trained at the Chintaman Rao College of Commerce grounds. When Tambwekar and Mandhana began their journey of training together, they would have to roll and water the pitch themselves. But now that Mandhana has gained a level of popularity, a lot of people come forward to help. Mandhana did not consider moving to a big cricket centre like Mumbai because she was convinced that her hard work and focus would pay off even if she stuck to facilities in a small town, says Tambwekar.

What's her success story?

At the age of 15, Mandhana displayed a penchant for big scores, recording three centuries and a double-century for the

Maharashtra under-19 team in the West Zone one-day tournament. This included an unbeaten 224 off 150 balls against Gujarat. She earned her maiden India call-up a couple of years later. In February 2016, Mandhana scored her first international century at Hobart (102 off 109 balls), in a match that Australia won by 6 wickets. Later that year, Mandhana became the second Indian, after all-rounder Harmanpreet Kaur, to sign up for the Women's Big Bash League in Australia. Turning out for Brisbane Heat, she had a sub-par campaign, scoring only 89 runs in 12 matches.

Have there been injury scares?

During the Big Bash League, Mandhana injured her knee, and it was later revealed that she had ruptured her

anterior cruciate ligament (ACL). This forced her out of action for five months, which took a toll on her self-confidence. Tambwekar admits Mandhana was hugely demotivated during that period and says his only task was to make her mentally strong through constant positive reinforcement. She took inspiration from Test star Cheteshwar Pujara, who has successfully negotiated two ACL tears. The ongoing World Cup has marked Mandhana's return to the international arena. All concerns surrounding her match-fitness were set aside when she hit the ground running in her comeback match, against England.

Why is she important to the team?

Mandhana, who will turn 21 on July 18, is at ease against pace, getting into good positions early to play her shots. This sound tech-

nique comes from her training routine, where she regularly faces promising junior and senior boys in the fast bowlers' nets. The charged-up lads are told to fire on all cylinders.

"She plays the boys comfortably. They bowl quick, but she pulls and hooks the bouncers. In comparison, women fast bowlers are quite easy to handle," says Tambwekar. Mandhana has a playing style all her own, but cricket fans may be reminded of two great timers of the ball when they see her cover drives and pull shots - Sourav Ganguly and Sri Lanka's Kumar Sangakkara.

In Mandhana and the consistent Punam Raut, India boasts of a world-class opening pair. Punam is the less adventurous of the two when it comes to shot selection, which lends stability to the top of the order. With accomplished names like Deepti Sharma, Mithali Raj and Kaur waiting for their turn to get a hit, rival bowlers are up against the wall.

ASHWIN ACHAL

WHAT

The lowdown on farm loan waivers



WHAT IS IT Farm loan waivers are not new to the Indian economy. In 2008-09, the UPA-I government announced a farm loan waiver of ₹60,000 crore (that was the initial estimate, which went up to over ₹70,000 crore later). It hit the exchequer, and

not the banks, but it distorted the credit culture since it discouraged farmers from paying up their dues. In addition, when one State offered a waiver, it raised expectations in other States too. Since the BJP took office in May 2014, starting with Andhra Pradesh, several States have joined the farm loan waiver bandwagon, with Uttar Pradesh and Maharashtra being the most recent ones, despite Union Finance Minister Arun Jaitley's stand that the States would have to foot the bill.

Mr. Jaitley had shown resolve to maintain fiscal discipline during his budget speech earlier this year, which was lauded by industry and investors. Hence, he told the States that the Centre would not pay for the waiver. On the other hand, the Reserve Bank of India (RBI) warned about the deteriorating fiscal position of the States. "We need to create consensus so that such loan waiver promises are eschewed. Otherwise, sub-sovereign fiscal challenges in this context could eventually affect the national balance sheet," RBI Governor

Urjit Patel said. He pointed out that if on account of loan waivers, the overall government borrowing went up, yields on government bonds would also be impacted. In a cascading effect, this would crowd out private borrowers as higher government borrowing could lead to an increase in the cost of borrowing for others.

HOW DID IT COME ABOUT

Two successive years of below normal rainfall, in FY14 and FY15, are being seen as the main reason for the loan waiver demand. But the recent farmers' unrest in Madhya Pradesh took place despite a good monsoon that resulted in a bumper crop. However, the prices of farm produce came under pressure because of demonetisation as there were 'fire sales' of vegetables - a fact which was acknowledged by the RBI. The sharp decline in food prices in the consumer price index-based inflation was evident. Retail inflation dropped to 2.18% in May as the decline in the prices of food and beverages was

sharper in May than April (-0.22% in May against 1.21% in April).

WHY DOES IT MATTER

The loan waiver will have a significant impact on the States' finances. According to a report by the State Bank of India, the impact on Punjab will be the maximum, with the State's fiscal deficit jumping by an additional 4.8% of the GSDP. The report says that the States will make provisions for farm loan waiver in their budgets in multiple years. In its recent report on the States' finances, the RBI also pointed to the worsening position of their financial health. It noted that the consolidated finance of the States had deteriorated in recent years, with the gross fiscal deficit to GDP ratio averaging 2.5% in the last five years (from 2011-12 to 2015-16), compared with 2.1% during the previous five-year period.

The RBI observed that the State governments faced severe resource constraints as their non-debt receipts were often insufficient for fulfilling their de-

velopment obligations. There is one positive aspect of the current loan waiver schemes, as highlighted by some economists: the schemes announced in several States have emphasised that loans should be waived only up to a specified threshold limit (mostly ₹1 lakh), and any amount over that will have to be paid.

WHAT NEXT

More such schemes will possibly follow as the States going to the polls have started upping the ante for a farm loan waiver. There are protests in several parts of Gujarat demanding a waiver. The State will go to the polls later this year.

Bankers have been concerned about this. As SBI Chairman Arundhati Bhat-tacharya put it: "In a case of a farm loan waiver, there is always a fall in credit discipline because the people who get the waiver have expectations of future waivers. Future loans given often remain unpaid."

MANOJIT SAHA

WHY

is our air becoming dangerous?

What is polluting cities?

It is now a part of record that several cities in India are among the most polluted in the world. The villain, in most cases, is aerosols and particulate matter. It is a catch-all term for particles of a certain size that are suspended in the lower reaches of the atmosphere. Aerosols emerge from a range of sources including dust, half-burnt carbon particles from vehicle exhaust and crop residues. Natural sources of aerosol include fog and haze. Studies, most of them in Europe, have drawn a link between particulate matter-levels and increased incidence of cardiovascular disease and respiratory problems. Now, it turns out, aerosols may be a grave threat to the Indian monsoon and maybe a bigger worry than greenhouse gases, like carbon dioxide.

What about greenhouse gases?

There's an ongoing debate on the relative role of greenhouse gases, such as water vapour and carbon dioxide, and aerosols in their influence over the

South Asian monsoon. To step back a bit, monsoon clouds gust into the mainland due to a pronounced difference in temperature between the land and the sea. Greenhouse gases trap heat and, over time, cause temperatures to rise over the land and the sea. This affects the temperature gradient between them and, over the decades, leads to a rise in the frequency of extreme rainfall or long, rainless spells. The IMD last year recorded 2016 to be the hottest year in India for over a century, and India has seen at least five drought years since 2002.

How are aerosols different?

Aerosols, while responsible for air pollution, smog and asthma, are known to shield the land from solar radiation. Though short-lived in the atmosphere compared to carbon dioxide, their absence would have made the earth hotter. However, the enormity of these dust clouds means that they depress land and sea temperatures. Consequently, this reduces the strength of the mon-



soon circulation. More than the quantity, it makes rain spells more erratic and because much of agriculture in India is still dependent on monsoon rains between June-September, they pose an additional threat to farmer livelihoods.

Why are aerosols a threat?

A study at the Indian Institute of Tropical Meteorology, Pune, led by climatologist R. Krishnan made us aware of aerosols. It is based on the institute's ongoing work to forecast the effect of

greenhouse gases - responsible for global warming and climate change - on Indian monsoon, over the next century. In 2015, Mr. Krishnan reported in the peer-reviewed *Climate Dynamics* that a combination of greenhouse gases, aerosols and changes in forest-and-agricultural cover was weakening the monsoon over the last 50-odd years. They derived this from mathematical modelling and simulating the climate on supercomputers. Then, the relative contribution of each of these factors were not known. "New simulations however suggest that aerosols may be a far more important factor than GHGs," said Mr. Krishnan while discussing preliminary findings at a meeting of the Indian Academy of Sciences in Bengaluru last week.

What does this mean for India?

The relative role of these climate-meddlers has consequences for India's plans to mitigate the effects of climate change. Measures to reduce aerosol emissions without curbing greenhouse

gas emissions could mean a hotter land mass and more instances of untimely, extreme rainfall events. Persistent aerosol emissions might lead to more instances of moderate rainfall but could mean anomalous weather and health hazards over large parts of north India. The aerosol-greenhouse gas relationship in exacerbating climate change is an old area of research but teasing out the relative contribution of each is challenging and influences the costs countries must incur to address them.

India has generally maintained that man-made carbon dioxide pollution is largely due to the years of pollution by the developed West. However, such an argument might weaken if aerosols were brought into the picture because this is a largely South Asian concern. Were carbon dioxide and aerosol interactions proven to be strongly linked, India could be under pressure to adopt more stringent climate-proofing policies.

JACOB KOSHY

WHEN

1 July, 2017

The thin red line: Fireworks exploded over Victoria Harbour to mark 20 years of Chinese rule, but President Xi Jinping, who travelled to Hong Kong for the occasion, had some harsh words. He warned that Beijing would not tolerate any challenge to its authority. "Any attempt to endanger China's sovereignty and security, challenge the power of the central government... or use Hong Kong to carry out infiltration and sabotage activities against the mainland is an act that crosses the red line and is absolutely impermissible," Mr. Xi said. Soon after he left the island, protesters took out annual pro-democracy marches, some carrying a large image of jailed Chinese Nobel Peace laureate Liu Xiaobo. Hong Kong was handed over by the British to China two decades ago in a tearful farewell. The Chinese President and Hong Kong Chief Executive Carrie Lam watched a presentation during their visit to a section of the Hong Kong-Zhuhai-Macau Bridge, which is under construction. This was Mr. Xi's first visit to Hong Kong after he became President in 2013. • AP & AFP



WHERE

In Mysuru, a yoga hub in the making



On June 21, Mysuru's yoga practitioners made headlines after 54,101 of them performed asanas on the turf of the expansive Mysuru Race Course on the foothills of Chamundi to commemorate the third International Day of Yoga. It missed making it to the Guinness Book of World Records but the event highlighted the fact that Mysuru is becoming a yoga hub.

Why is it a tourist spot?

Mysuru attracts a lot of tourists. Once the capital of the kingdom of Mysore, at

its heart lies the Mysore Palace, seat of the erstwhile rulers, the Wadiyars. Mysuru is also the gateway to several national parks. Other than tourism, another reason for foreigners to visit Mysuru is yoga. Like Rishikesh in Uttarakhnad and Pune in Maharashtra, which are important yoga destinations, Mysuru attracts many foreign nationals who want to learn the ancient art. Not just international visitors, enthusiasts from metros and IT sectors from key Indian cities also visit Mysuru to learn the ancient practice from yoga gurus.

Some yoga studios like Ashtanga Yoga Research Institute, Nirvana Yoga Shala (Mystic Yoga) and Vedavyasa Yoga Foundation are well-known internationally. The yoga education centres draw practitioners from the U.S., Europe, South America and other nations between October and March, considered the peak season for yoga.

Legendary gurus the late K. Pattabhi Jois and the late B.K.S. Iyengar popularised yoga globally. While Jois founded the Ashtanga Yoga Research Institute in



Mysuru and popularised Ashtanga Yoga, Iyengar, who learnt yoga in Mysuru, practised and taught in Pune. These stalwarts motivated a large num-

ber of students from the United States and Europe to learn yoga. Pop star Madonna, rock icon Sting and Hollywood actor Gwyneth Paltrow were among the disciples of Jois. Importantly, the reason why yoga got a firm grip on Mysuru is the fact that the Wadiyars patronised it.

Is the infrastructure in place?

The upmarket Gokulam and Lakshmi-puram are the city's leading yoga education destinations. On an average, about 2,000 foreigners visit the city every month in peak season to learn yoga. There are 150-plus yoga schools in the city, including 20 reputed studios.

Foreigners clutching yoga mats are a common sight in these localities. They take up short-term and long-term courses such as Hatha Yoga, Ashtanga Yoga and Pranayama, based on the duration of their stay.

How has yoga helped tourism?

Many practitioners claim that yoga has played a role in bringing more tourists

to Mysuru, a most-sought after destination in the southern circuit, and benefited the local economy, especially the hospitality industry. Many PG accommodations have come up to house these visitors, giving employment to the locals.

Stakeholders in the tourism sector say that foreigners coming to learn yoga often write about the magnificent palaces, heritage buildings, the temples around it and so on, in their respective countries, helping to increase the tourist arrivals, especially during the world-famous Dasara festivities. Yoga guru Shashi Kumar of the Nirvana Yoga Shala says e-visa has helped to promote yoga with many foreigners applying for visa naming it as the reason for their trip to India. The perception of yoga has changed and people have started making it a part of their life. Mr. Kumar says the change can be attributed to the international status yoga got three years ago.

SHANKAR BENNUR

The monster in our drawing rooms

And it has its own priesthood: people, often very rich, very privileged, convinced that for whatever reason many millions need to die



THE CONTROVERSIAL INDIAN

TABISH KHAIR
is an Indian novelist and academic who teaches in Denmark

Ten million famine deaths are expected to take place in parts of Africa over the next few years. Around 300,000 indebted farmers have committed suicide in the hinterlands of India since 1995. At least 150,000 people have been killed by war in Afghanistan and Pakistan since 2001, and about half a million in Syria since 2011.

Do you want to be quoted the figures from Iraq, Libya, Sudan? The Christians killed in Egypt; the Muslims killed in Burma; the innocents mowed down by gun-rights fanatics in the U.S.; the refugees allowed to drown off the coasts of European nations?

There is a monster sitting in our

drawing rooms, and it has been swelling like a bedbug on all this bloodshed.

Was it always there, a homunculus hidden in the folds of our sofa, sucking tiny drops of blood every time we refused to protest the brutalisation of some person or group different from us in terms of caste, colour, religion, region, gender or sexuality?

How did it enter?

Or did it enter our drawing rooms, wafled like a germ from the neighbourhood, where people spoke of teaching some other people a 'lasting lesson'? It might even have entered on the glare of the TV set, for instance, when talk panels justified the sufferings of the poor and the vulnerable by quoting economic factors. I don't know. But believe me, even if we do not see it, the monster is there in our drawing rooms. Yours and mine.

Recently, an American friend exclaimed to me: "I do not understand how these Republicans can deny medical care to Americans! Can't they see that thousands of poor Americans will die needlessly and, at times, horribly?"



I felt like asking her, haven't you seen the monster in your drawing room? But I didn't because I have myself been avoiding the monster in my drawing room.

I can sense the monster getting bigger, but I refuse to look at it. I can feel its foul breath on my neck; I can hear its vi-

cious whisper. I pretend the whisper comes from elsewhere. It is easy to do so: there are similar whispers coming from elsewhere too, other drawing rooms, even the TV sets, for of course a similar monster is breathing down everyone's neck.

Often, the monster says this: Capital is the only index of value. Sometimes it also says this: You are only responsible for yourself. Or this: If they cannot manage, it is their headache. Or this: God would not have made them sheep if he did not want them butchered. Or this: Evolution means the survival of the fittest. Or this: Greed is good. Or this: Violence is natural. Oh, the monster says a lot of things. But there is one word it does not utter. That word is its own name. That word is: Genocide.

It does not utter its own name, because it does not want us to see it. Yet.

Yes, the monster is called Genocide, and it sits in our drawing rooms, justifying the eradication of those different from us in the name of wealth, science, god, nature, necessity, whatever. The monster whispers to us that this is inevitable. Some people just cannot man-

age, it murmurs. The world is over-populated, it smirks. Who cares for losers, it scoffs.

The monster has its own priesthood. There are people - often very rich, very privileged - who are convinced that (for whatever reason) many millions need to die. Some because of a different faith, some because of a different lifestyle, some because they are farmers, some because they are unemployed, some because they are poor Africans, some because they are poor Americans. The reasons do not really matter. This elite priesthood would find other reasons, if necessary, to justify the murder of millions.

I suppose when 1% of the world comes to own more than half of its wealth, it is inevitable that the lives of the other 99% will be progressively devalued. Some cut medical benefits in the U.S.; some talk of colonising Mars. It's the same devaluation of life on Earth.

People say we are living through an 'Age of Conflicts', an 'Age of Anger', an 'Age of Fundamentalisms'. I am convinced that we are living through the

'Age of the Monster'. And that monster is a hidden genocide, a slow genocide that is meant to cull the Earth of its 'undesirables'. In some circles, I suspect, this is said; in other circles, it is implicit. But the genocides are on, and they are multiplying, even as we sip tea in our drawing rooms.

Other mass murders

And behind these silent genocides are other, larger and more silent, mass murders: those of entire species of plants, birds, fish, animals, insects. The 'necessary' killing of those we can use in the short term, and those we find useless in the shorter term. The 'market-justified' reduction of the immense complexity of life on Earth - to the simplification of capital, usage, convenience. The monster in our drawing rooms is swelling. It looms over us now, but we still refuse to see it. Will we ever see it? Or will we see it at the last moment, and realise that we are powerless to do anything to stop it now?

As it always happens in horror movies, the last moment is too late for words: one can only shriek then.

A soul's right to pick its species

Being born a human, on a ball of dirt with no future, is a sign of cosmic dumbness



ALLEGEDLY

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I am at that stage in life where 'one plus' is not good news unless it's a phone I've been gifted. In the context of my age, it's the opposite of good news. The last thing I want is to attract undue publicity to my existential depreciation by a factor of 365 days.

But the day came by last week, and as happens every year, the barrage of birthday greetings plunged me into mild depression.

I find it impossible to make people understand that I don't want to be reminded of the day I took the most foolish decision of my life - a blunder that must pale in comparison to the one the Americans made recently when they picked a President. Invariably, I spend the day brooding over what might have been if only I had chosen wisely.

Liberation from a 'prison house'

Just imagine: once upon a time, you were a carefree soul wandering the ether, having only recently been liberated from the prison house of the body. You could go wherever you liked, visit whichever country or planet or solar system that caught your fancy.

You could be in Iceland one moment, enjoying the view from Mt. Eyjafjallajökull, and in Asgard the next, dancing with the gods in a rave party on Rainbow Bridge. You could make surprise appearances at random séances and scare the shit out of stupid teenagers mucking about with Ouija boards. You didn't have to worry about filing IT returns or booking an Ola cab - ever. You were a happily disembodied soul for whom the entire universe was an open book, just like private data in post-Aadhaar India.

And yet, this was the life I chose to give up - for what? For the opportunity to pay 18% GST on dental wax? To be bullied by heartless apps and mindless algorithms? To awake one morning from uneasy dreams and find my-



self transformed into a gigantic alphanumeric that's no longer valid?

Just consider: as per the latest estimates by NASA, there are at least 200-300 billion galaxies in the universe. Together, they offer you 1,000,000,000,000,000,000,000,000 planets to choose from. And I chose to be born on that one ball of dirt that has no future. What kind of cosmic dumbness is that? If you thought that was bad enough, hold on. There are 8.7 million species on Earth, still. As a soul on a long sabbatical from mortality, even if I had begun to miss the comforting warmth of biological tissue, I could have easily opted to be born as, say, a koala. I could have spent my life blissfully munching away on raw cauliflower or whatever it is that koalas eat.

Or I could have been born a sponge - where you wake up every day with the happy certainty that you need to do absolutely nothing to stay alive. No predators to flee from, no obsessing about finding a mate, and no deadlines. To top it all, you are beautiful, non-vegetarian, and get to live by the sea. Perhaps my soul craved excitement a little too much to settle for the life of a sponge.

And yet, even if I wanted a parasitical life of violence, death, and killing with zero risk of repercussions for my actions, I could have chosen to be born a virus. I'd be immune to the death penalty no matter what I do. I can right now think of at least five people I would love to infect, one of them a

large politician with a larger following on Twitter.

Penchant for self-destruction

Instead, I picked a dying species with a penchant for genocidal self-destruction. I picked Homo sapiens. Only to witness every day its steady extermination from the face of the earth. Today Homo sapiens have everywhere been displaced by different breeds of Bt humans: Homo economicus, Homo technologicus, Homo avarus, Homo mendax, and Homo ignorans, with the two most populous varieties being Homo patiens and Homo demens.

It was while processing these depressing thoughts that I got a message asking me to come to Jantar Mantar for the 'Not in My Name' protest. Thinking it might do me good to get some fresh air, I decided to go.

Imagine my horror when I reached the protest site and found it teeming - literally teeming - with rootless cosmopolitans. Every single one of them was busy practising emotional treachery. Though the protest was presumably against murder in the name of the cow, not one of the protesters chanting 'not in my name' was actually a cow. Neither was I. Then what was I? And why was I here?

That's when it hit me. No more mistakes. In case I don't crack *moksha* in this birth and must apply again by re-entering the cycle of rebirths, I knew exactly which species to pick: Homo taurus indicus.

The Aligarh connection

Both Shias and Sunnis offer congregational prayers in AMU's Jama Masjid



WHERE STONES SPEAK

RANA SAFVI
is a historian, author and blogger documenting India's syncretic culture

For every Aligarh Muslim University (AMU) alumnus, October 17 is special as it marks the birth anniversary of its founder, Sir Syed Ahmad Khan.

When I was studying at the AMU, the only time I saw its Jama Masjid was during a celebratory dinner somewhere near the Sir Syed Hall. But as it was dark and there was a huge crowd there, it didn't register. It was only while reading Sir Syed's book *Aasar-us-Sanadeed (Remnant Signs of Ancient Monuments)* that I realised its significance.

Destruction in 1857

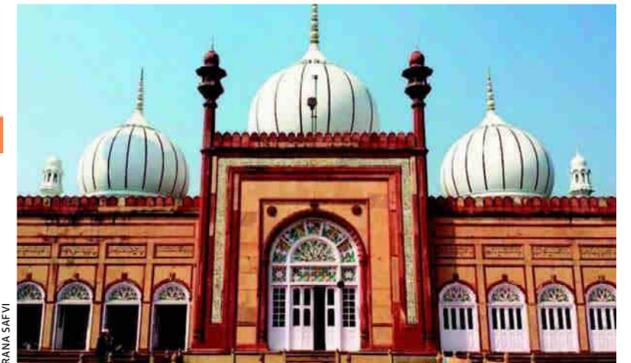
The year 1857 was a watershed for India, especially for its capital Delhi. After a four-month-long siege of Delhi, the Indian 'rebels' - as the British termed them - were defeated and the British East India Company with its army seized control of the Lal Qila (Red Fort) and the city of Shahjahanabad (Old Delhi) and imprisoned the ageing Mughal Emperor, Bahadur Shah Zafar. He was exiled to Rangoon after a travesty of a trial where he was accused of sedition against his own empire.

Having gained control of the city, the British systematically went about destroying all the places they thought had housed the 'rebels' or had played an important part during that time.

One of these was the beautiful Akbarabadi Mosque built by Aizaz-un-Nisa Begum, wife of Shah Jahan, in 1650 A.D. She had been given the title of 'Akbarabadi Mahal' after the place of her birth and thus the masjid also became famous by that name.

It was lovingly described by Sir Syed in the first edition of *Aasar-us-Sanadeed* as being a "beautiful and heart-pleasing masjid", one that "refreshes the eyes and rejuvenates the spirit".

He went on to write, "In front of it, even the Masjid of the Green Dome (in



Medina) looks small."

The mosque followed the prevailing style of the era and was built with three domes, seven arches in the façade and two lofty minarets. Sir Syed wrote, "In front of that there is a square 12 x 12 yards *hauz*, which can make the springs of the sun and moon blush." It stood in an area which was earlier known as Faiz Bazaar.

After its destruction in 1857, when Sir Syed visited the place, he was in tears to see the rubble. He allegedly said, "Sahib, angrezo ney Akbarabadi Masjid ko shaheed kardiya hey (Sir, the Englishmen have martyred the Akbarabadi Masjid)." The foundation and platform of the mosque were completely demolished when Edward Park was built in 1911. It is now known as Subhash Park.

In the aftermath of the Uprising of 1857 and the systematic persecution of the Muslim community, especially the elite who the British felt were mainly responsible for the 'revolt', Sir Syed set about thinking of ways to rehabilitate the community. One of them was to integrate them into Indian society via Western education and thus was born the idea of the Muhammadan Anglo-Oriental College, which went on to become the Aligarh Muslim University.

Though the foundation of a Jama Masjid (congregational mosque) for the college's students was laid in 1877, its construction got delayed due to various reasons, getting completed much after Sir Syed's death. It was declared open in February 1915.

Ali Nadeem Rezavi, a professor at the AMU's history department, tells

me that the inscriptions on the Akbarabadi Mosque, which included the *Surah Fajr*, were unique as they were done by Abdul Haq Amanat Khan, the same genius behind inscriptions on Taj Mahal and Sikandra.

To cite the AMU's gazette, these inscriptions were presented to Sir Syed for use in the Jama Masjid by Shahzada Sulaiman Jah Bahadur. The latter had bought them from a scrap dealer in Aligarh, who had the rubble of 1857 monuments brought for sale.

As Mr. Rezavi says: "These Shahjahani calligraphic panels in black stone on white marble connect the AMU Jama Masjid with the Taj Mahal and Akbar's tomb in Sikandra. At all three places one can see the workmanship of the same master-calligrapher."

He says many features distinguish the AMU's Jama Masjid. It was the last mosque in India to be built with an arcuate-style true dome. (An arcuate dome is built on the system of true arch, with the help of voussoirs and keystones.)

Emperor Jahangir claims in his memoirs that in the reign of both him and Akbar, his father, Shias and Sunnis offered congregational prayers in the same mosque. The AMU's Jama Masjid is the only place where it still happens, says Mr. Rezavi.

To the west of this grand mosque are the cricket grounds where, as a student, I remember cheering for my favourite team.

Sir Syed himself lies buried in a simple yet very elegant grave and it is to him that many owe their education and career.

The moral coarseness of our public culture

Our complex moral sensibilities are cultivated less within the family, more through systematic teaching in the humanities



THE PUBLIC EYE

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If some wrong is done to people close to us, to our family or friends, we respond with utter horror, as we must. Why then do we react feebly or, worse, not at all when people beyond our little community are treated cruelly? More specifically, why has there not been greater collective outrage at mob lynching of a poor Muslim or the horrendous brutality regularly faced by Dalits?

Why is it that instead of a chorus of straightforward condemnation, we confront moral indifference or troublesome public statements such as that we must first or also condemn other instances of brutality in the past? Imagine Nirbhaya's mother being told in the aftermath of the dastardly incident that any denunciation of what happened is conditional: we must in the same breath

also condemn all brutal rapes in the past. The moral coarseness of this response simply jumps to the eye.

Our public culture

Has the savagery around us numbed our sensibilities to the suffering of others? Has the 'dirty' politics around these incidents put off 'decent' men and women, compelling them to withdraw into their shell, fall silent? I don't know. I admit to having no direct explanation of this phenomenon. But I draw attention to two aspects of our public culture that contribute to our shared moral coarseness.

First, many of us, the metropolitan middle and upper classes, have begun to believe that moral values are individual preferences, a matter of subjective taste, something each individual can choose, so that what is valuable for one person need not be valuable or good for another. Moral values, it is claimed, vary from individual to individual. There is no objective morality - call it moral subjectivism. Two lessons are usually drawn from this: (a) that we can never arrive at a common understanding or agreement on moral values, and since there is no shared morality, (b) no one should pass moral judgment on others. One step further and we arrive at

the calamitous consequence of presuming an absence of common moral judgment even on issues where agreement can easily exist, such as that it is wrong to be cruel to other human beings. This too is mere subjective opinion!

The second, equally serious, is the other side of the moral subjectivist coin. This is the widespread belief that while no common judgment is possible in value-laden human affairs, in the non-human domain, in the world of nature and things, where no moral values reside, a unique common judgment, one right answer is always available. Get rid of subjectively moral values from the world, free it of moral or human understanding, and shared judgment and objective knowledge will follow - objectivism. Furthermore, wherever humans can be viewed as objects or things, as in purely scientific treatment of human affairs, mainstream Western medical regimes or in the economic domain, a unique value-neutral answer exists, valid not just for one but for all.

Where both subjectivism and objectivism converge is that they make common human understanding either impossible or redundant. In the moral domain, subjectivism tells us, there is no common human understanding. And the objectivism of the scientific



world view tells us that a common understanding is possible only in a world free of moral values.

But an urgently needed moral response to all kinds of social situations, including lynching or bombing of innocents, depends precisely on human-to-human or common understanding, the ability of one human to actually or imaginatively share a situation with others and to understand his pain, suffering or predicament. Moral judgment and moral outrage depend on empathetic understanding and compassion.

But we are not born with these capacities; they are learnt. Understanding the perspectives of others by their own

lights and imagining their sufferings and predicaments is an acquired skill; we are taught to rise above one's own provincialities, to respect difference and plurality, to value the social uses of reason that help explore new forms and levels of agreements or experiment with reasonable disagreements; to critically examine received knowledge, to make sound judgment in the face of complex dilemmas, to achieve greater self-understanding.

All these capacities depend upon thought and imagination that are cultivated. And for all this we need not physics, chemistry and mathematics, but philosophy, literature and narratives embedded in different religious traditions. We need to read and think with the *Panchatantra*, the *Jatakas*, the *Mahabharata*, with Plato, Buddha and Confucius, with Al-Ghazali and Rumi, with Annamacharya and thinkers in the Varkari tradition. In short, we need education in the humanities.

Not just employability

Our complex moral sensibilities are cultivated less within the family and more through systematic teaching in the humanities. An education system that neglects the humanities is slowly moving towards a moral disaster. But it is just this,

a technocratic, humanities-free education system that devalues common human understanding, that many of us from the middle and upper classes wish to have for our children. By viewing education solely in terms of its employability quotient, how it helps us secure jobs - instruments of greater material prosperity for individuals, and tools for multiplying objectively measurable national assets (GDP, bigger profits and greater power) - we unwittingly invite moral coarseness upon ourselves.

When it comes to our family and close friends, our raw moral intuitions suffice. These intuitions are so strong that they overwhelm the moral vacuum encouraged by our humanities-devaluing education system. But when it comes to all other humans, our raw intuitions are too feeble. We desperately need a humanities-sensitive education to cultivate a sophisticated moral sensibility, for moral enlargement beyond kith and kin.

Alas, what we are receiving instead is further moral restriction. A culture that once treated all its elders with generosity and respect shows increasing sign of moral callousness towards even old parents. I fear this development may not be unrelated to the brutishness with which we treat those outside our fold.

CAPSULE



Zika and microcephaly
There is better understanding of how Zika virus infection in pregnant mothers can cause microcephaly in the child. A neural precursor protein MS11 binds to the Zika virus RNA enhancing virus multiplication in the cells. This interaction leads to risk of giving birth to a child with microcephaly.



Spreading cancer
It was thought cancer spreads from the tumour to the lymph nodes supplying that area and thereby to distant organs. This sequential progression model is now found to hold true for only one-third of people. In the rest, spreading to distant organs and lymph nodes rose from independent sub clones in the tumour.



Galapagos is hot!
The earth's mantle, the layer between the crust and the outer core, is not uniformly hot everywhere. Studies have found that below the Galapagos region, the mantle is about 400 degrees hotter than the average! This was found by examining the chemistry of the Tortugal lava suite from the Galapagos area.



Gossiping bees
It is not that bees find nectar by searching flowers only. They also pick up a lot from social cues. This came to light by studying 42 species of bees that were collecting honeydew from shrubs, produced by scale insects. Since honeydew is usually unadvised, the guess is that they use social cues to locate it.



Feminist butterflies
Male cabbage butterflies produce complex ejaculates contained in spermatophores along with sperm. This helps their sperm defeat those from other males in the race to fertilise the eggs. This sets off an arms race between males and females. The female develops a range of proteases that can restore her own control over her receptivity.

ODD & END

Supersmellers get fat

Our sense of smell is key to our enjoyment of food, therefore, it may be no surprise that in experiments at the University of California, Berkeley, obese mice who lost their sense of smell were found to also lose weight. Researchers developed ways to temporarily eliminate the sense of smell in adult mice and discovered that those mice that lost their sense of smell could eat a high-fat diet and stay with a normal weight, while littermates that retained the sense of smell ballooned to twice the normal weight. Supersmellers gained more weight than did normal mice on the same high-fat diet. Smell-deficient mice burned excess fat instead of storing it, thereby suggesting a link between smell and metabolism.

IISc works to make a common antibiotic more effective against TB

R. PRASAD

Bacteria develop resistance against a drug only when they are exposed to it or when the drug is misused. But now, a team of researchers from India has found whether and how drug resistance can develop against a candidate drug called Augmentin even before the drug is approved for treating patients with drug-resistant TB. Augmentin is currently undergoing clinical trials in patients with drug-resistant TB; it is already being used for common bacterial infections.

Besides deciphering the mechanism by which TB bacteria can develop resistance against Augmentin, the researchers have found ways of overcoming this potential resistance mechanism, thereby making Augmentin a potentially powerful drug to treat both multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB).

The beta-lactam class of antibiotics such as penicillin, ampicillin and amoxicillin is one of the most widely used class of antibacterial drugs. Despite its ability to kill several types of bacteria, the beta-lactam antibiotics have never been used against TB bacteria. This is because TB bacteria are naturally resistant to this class. TB bacteria inherently produce an enzyme called beta-lactamase which breaks down beta-lactam class of antibiotics (through hydrolysis) and makes the drug ineffective against TB disease.

Making of Augmentin

One of the strategies of getting around using the beta-lactam class of antibiotics is developing an inhibitor against beta-lactamase enzyme. Clavulanic



On a mission: Prashant Shukla (Left), Amit Singh and Saurabh Mishra used integrated experimental technology and computer tools to understand the mechanism by which resistance sets in.

acid is one such inhibitor, which blocks the beta-lactamase enzyme. Augmentin, which is a combination of a beta-lactam antibiotic (amoxicillin) and beta-lactamase inhibitor (clavulanic acid), can thus be an effective drug against TB bacteria.

"Till now no one knew the exact mechanism of how the combination of beta-lactam and beta-lactamase inhibitor was killing TB bacteria and how resistance against the combination can emerge in future," says Dr. Amit Singh from the Centre for Infectious Disease Research at the Indian Institute of Science (IISc), Bengaluru, and the corresponding author of the paper published in the journal *eLife*. "Our study was able to provide insights into how resistance against Augmentin can emerge."

The team used integrated experimental technology and computer tools to understand the

mechanism by which resistance against Augmentin can set in.

Deciphering the mechanism

The first thing that the researchers asked was how the TB bacterium senses the presence of the drug combination in and around it. "We found the bacterium when exposed to this drug combination changes its metabolism and respiration, which led to the production of sub-lethal amount of reactive oxygen species (ROS). The ROS acts as a danger signal for the bacteria to mount a defence mechanism against Augmentin," Dr. Singh explains.

The defence mechanism is through a protein called WhiB4, which is normally present in bacteria and is responsible for regulating the production of beta-lactamase enzyme. When the WhiB4 protein senses the ROS signal, it produces large amounts of beta-lactamase enzyme in the TB

bacteria. "This could be one method by which the bacteria can become resistant to Augmentin," Dr. Singh says.

Besides producing beta-lactamase enzyme, the WhiB4 protein also controls the production of an antioxidant molecule called mycothiol. The main role of mycothiol is to reduce the excessive increase in ROS so that ROS level is kept in balance; excessive ROS can kill bacteria by damaging proteins, DNA, and cell wall lipids.

"The WhiB4 protein can detect the ROS signal produced by antibiotics and direct the production of both beta-lactamase and mycothiol, which work together and contribute to bacterium's ability to resist Augmentin," says Saurabh Mishra from the Centre for Infectious Disease Research at IISc and the first author of the paper.

Making Augmentin powerful

The researchers demonstrated that it is possible to kill MDR-TB and XDR-TB by simply changing the levels of the regulator, WhiB4, and/or increasing the ROS levels inside the bacteria. "When we knocked out mycothiol production, the level of ROS increased inside the bacteria and ultimately resulted in efficient killing of drug-resistant TB bacteria," he says.

There are certain antibiotics (such as clofazimine) that work by increasing the ROS levels inside bacteria. The researchers are currently testing if using such antibiotics along with Augmentin can efficiently kill drug-resistant TB bacteria. Augmentin and clofazimine antibiotics can together elevate the production of ROS. The excessive ROS inside the bacteria can then kill all forms of drug-resistant TB bacteria.



Superstars: Nearly 200 candidates were found. •SPECIAL ARRANGEMENT

Twenty-five giant radio galaxies found

SHUBASHREE DESIKAN

A team of six scientists has discovered the presence of a large number of what are known as giant radio galaxies (GRGs) across the universe. Such galaxies are, as the name suggests, huge, and the smallest one in this batch that has been discovered could big enough to hold 33 copies of the Milky Way placed next to each other. The galaxies have a supermassive black hole, which could be even billions of times as massive as the Sun, at their centre. Jets of charged particles are ejected from this black hole at very high speeds, close to that of light. In fact, the jets reach out to a distance even larger than the giant galaxies which host them, making the galaxy prominent when imaged with a radio telescope.

Nearly 200 new GRG candidates spread across the sky were found by the six researchers, most of whom were in institutes in Pune. "Twenty-five select galaxies are published in this work. [The] Rest will be published soon. Some are followed up for further studies with our own Indian radio telescope - the Giant Metrewave Radio Telescope (GMRT) located near Pune, India," says Pratik Dabhade, who is a PhD student of Joydeep Bagchi of IUCAA in Pune,

and is an author of the paper, published in *The Monthly Notices of the Royal Astronomical Society*.

In order to discover the 200 GRGs, Pratik and colleagues had to search carefully through 300 big radio images from the NRAO VLA Sky Survey, taken nearly two decades ago. From this they identified candidate GRGs and then further searched the (optical) host galaxies by poring over the literature.

What started off as a Master's thesis problem for Pratik grew into a project with six people getting involved.

This is, however, not the first detection of a GRG by Indian astronomers. "There was the previous detection of a single GRG from India in 2015-16 using GMRT. It was special because it was found at a very long distance from us," says Pratik in an email to *The Hindu*.

He also describes the significance of the discovery thus: "Since GRGs extend to Mpc [megaparsec] scales (which is almost the size of a galaxy cluster), they can be used as a probe of the medium between galaxies and clusters of galaxies. Finding them at a larger distance from us means finding them in the older universe. GRGs are very useful in understanding the growth and evolution of radio galaxies."

Tea plantations decrease bat diversity

Forests now fragmented by tea or coffee plantations were their home

AATHIRA PERINGHERY

A recent study shows that tea plantations in the Western Ghats harbour less-diverse bat communities - that perform fewer ecological functions - than those found in coffee estates and forests. Protecting existing forest fragments and river stretches in such intensively-cultivated landscapes could be crucial for bats, which are important insect controllers, pollinators and seed-dispersers.

Different bat species can perform these varied ecological functions due to the physical features they have evolved, which help them specialise in hunting different prey across habitats. Bats with short, broad wings, for instance, are better suited to plucking off large insects on the wing, in densely-vegetated patches like the forests of the Ghats.

But forests in this mountain range have changed drastically. In Tamil Nadu's Valparai, for instance, tea and coffee plantations have fragmented natural forests. To examine how bats respond to such extreme changes in land use, scient-



Homeless: Bent winged bat

•RAHUL KHANOLKAR

ists from the Nature Conservation Foundation, National Centre for Biological Sciences and the University of Leeds (UK) quantified bat communities in Valparai, based on their ecological functions. Across different habitats, they examined bat diet, echolocation, body size and wing morphology (which determines their mode of hunting and what habitats they are adapted to).

The scientists found that tea plantations fared badly: only few insectivorous bats that could adapt to highly modified habitats thrived here. However, rivers running through plantations helped offset

this slightly. Coffee plantations did better because of native tree presence which is required for coffee growth; but protected areas and forest fragments were the most 'functionally' rich, home to bats with diverse morphologies corresponding to their several functional roles in the ecosystem.

The team's results show that bats with shorter and broader wings, like the lesser woolly horseshoe bat, are most vulnerable and require urgent conservation action in Valparai. "These bats are insect eaters; they keep ecosystems healthy and functioning by keeping the insects they eat in check," says lead author Claire Wordley.

Bats and other fauna could benefit if tea plantation owners leave a buffer of native trees on both sides of every river, write the authors. Protecting existing forest fragments and extending them wherever possible could also help.

"While tea plantations will never be as rich for wildlife as coffee plantations, it can be more biodiversity-friendly if small changes in land use practices are implemented," says Divya Mudappa of NCF.

Studying the health of Arabian Sea

The impacts of annual ban on trawl fishery will be assessed

K.S. SUDHI

The marine ecosystems of eastern Arabian Sea would soon become the stage for a series of biogeochemical and biological studies, which are expected to throw light into the ocean dynamics and economy.

The Centre for Marine Living Resources and Ecology (CMLRE), Kochi, and the Integrated Coastal and Marine Area Management - Project Directorate, Chennai, both functioning under the Ministry of Earth Sciences, have drawn up a three-year-programme to study the coastal seas of western India. The researchers have primarily identified health of sea, carbon credit, biological productivity, trawl ban effects and oceanography as the thrust areas for the research.

Under the category health of sea, the researchers would assess ecosystem status of western coastal India for biological resources which are influenced either by natural processes or man-made effects.

The green house gas emissions from the ecosystems would be assessed for redefin-



Coastal zone: The study would redefine marine carbon credit

•VIVEK BENDRE

ing marine carbon credit, as part of India's commitment to the 2016 Paris Climate Change Summit, said M. Sudhakar, Director, CMLRE.

The impacts of annual ban on trawl fishery and its impact on fishery resources will be looked into. The influence of coastal upwelling and associated biogeochemistry and biological oceanography on coastal fishery including their mortality, will be studied as part of the project, said G.V.M.

Gupta, the Principal Investigator of the project.

Preliminary studies carried out at the south-western coast of India, according to a project note prepared by CMLRE, have indicated that monsoon trawl ban had a positive impact on benthic production. Similar studies are essential for entire west coast to assess the overall impact of monsoon trawl ban on fishery resources, it said.

The "evolution to decay of upwelling, its dynamics and associated bio-geo-chemistry all along the eastern Arabian Sea," the inter-relationship between winter convective mixing (oxygen minimum zone) and coastal upwelling, "factors behind the formation/intensification of seasonal hypoxia (deoxygenation) and greenhouse gases production along the eastern Arabian Sea shelf" will be monitored under the project.

The National Institute of Oceanography, Kochi, and Physical Research Laboratory, Ahmedabad, and a host of fisheries and scientific research institutions are expected to join the project.

Cocoa: A tonic for cognition and memory retention

This third-in-line beverage tops the other two, coffee and tea, in health benefits, yet it has not become as popular



SPEAKING OF SCIENCE

D. BALASUBRAMANIAN

Coffee and tea came to be popular in India essentially due to colonial history. They are both imports into our country, and we now grow them in large plantations. Today, Darjeeling Tea and Coorg Coffee are world famous and coveted. Yet, an equally popular drink, cocoa, has not become that popular. All we do is, pretty much to eat it in the solid, processed form as chocolate bars, but not as a "Cuppa."

Colonial history has a role in the popularisation of cocoa too, but elsewhere. Cocoa was first discovered and coveted by the Mayan civilisation of Central America. The Mayans gave the plant (and its seeds) the name cocoa (or cacao), meaning 'The Food of the Gods'. Cocoa seeds were used in family and community functions, and even used as currency. The Aztec Indians there made a drink with cocoa powder, chilli, musk and honey, calling it *Chocolatl* or "beaten drink"; hence the name chocolate.

When the Spanish colonised much of the Americas, they popularised and monopolised cocoa, making its production a well guarded secret as they brought

it to Europe. Cocoa became the drink of the super rich. A lot of romance and class was associated with it. Love songs, courting the beloved, were written and sung (and are still done) in Europe and America. (For example, you can enjoy watching Doris Day singing "A Chocolate Sundae on a Saturday Night" on Youtube). But as the Industrial Revolution made machines popular, the grinding of cocoa seeds in large amounts and making them available to "all and sundry" made cocoa or hot chocolate lose their fancy.

Only 3 million tons

Today, while 10 million tons of coffee and 5 million tons of tea are produced yearly across the world, cocoa has a production of about 3 million tons. Yet, this third-in-line beverage tops the other two in health benefits. Indeed, much to the consternation of many in South India, we need to point out that coffee is a "drug," albeit a mild one, because of the caffeine it contains. Because of this, many people have taken to drinking "decaf" coffee (which is neither here nor there!). Tea, on the other hand, is now recognised to be a health drink, with its content of molecules of the so called flavonoid family acting as antioxidants and cell-protecting molecules (True, it too has caffeine and theobromine, but much less than coffee). But it is cocoa that tops the list as the healthiest drink. Yet it has not become as popular as tea and coffee - a quirk of history based on who our colonials were!

Over the years, it has become increas-



Health drink: Should one quit coffee and tea and go for this dark brown powder? •GETTY IMAGES/ISTOCKPHOTO

ing clear that cocoa and chocolates not just good to taste, but are good for cognition as well. Of particular interest is a paper published by Valentina Soggi and colleagues, titled "Enhancing human cognition with cocoa flavonoids," which has appeared in the journal *Frontiers in Nutrition*, 16 May 2017 (free access). The authors point out that the family of flavonoids (catechins, quercetin, anthocyanidins) present in cocoa not only act as antioxidants and cell protectants just as tea does, but they protect human cognition, counteract cognitive decline and memory loss as well. In other words, they act directly on the nervous system of the body and the brain. The Soggi paper above quotes several earlier works, both relating

to the basic biology of the flavonoids in improving health and cognition, but also about a dozen trials involving human volunteers, many of whom show improved working memory, in addition to improvement in blood pressure and insulin resistance.

Cocoa and cognition

An Italian group led by Dr. G. Desideri has conducted randomised controlled human trials, and found benefits in cognitive function, blood pressure and the metabolic profiles of elderly subjects with mild memory impairment. They call these studies the Cocoa, Cognition and Aging (CoCoA) study.

What are the molecular underpinnings

involved in the mechanisms contributing to learning and memory? An earlier paper by Dr. J.P.E. Spencer, in the journal *Proc. Nutr. Soc.*, 2008, on the control of long-term potentiation and memory lists a series of proteins and enzymes, and how these plant flavonoids reach the brain, crossing the blood-brain barrier, and effect their action. While the exact modes of action are yet to be clarified, it appears that they may protect neurons against damage, reduce inflammation, promote and even generate new connections between nerve cells.

An editorial in the *American Journal of Clinical Nutrition* in 2015 agrees with much of the conclusions drawn on the positive effects of cocoa on memory retention and gain, and points out that unsweetened and unprocessed dark cocoa powder would be the best, while that processed with alkali (which is paler, and more common in candy-bars) is less effective. It is estimated that 100 grams of the usual dark chocolate contains about 100 mg of flavonoids, while 100 mg of unsweetened and unprocessed cocoa powder may have as much as 250 mg.

Should one then quit coffee in the morning and go for dark cocoa powder? A friend (whose name skips me for the moment) has suggested that I drink a cup of cocoa every day, along with the morning coffee and the afternoon tea, and perhaps include a glass of red wine in the evenings, so as to maximise benefit - sound advice!

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