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India Polluted

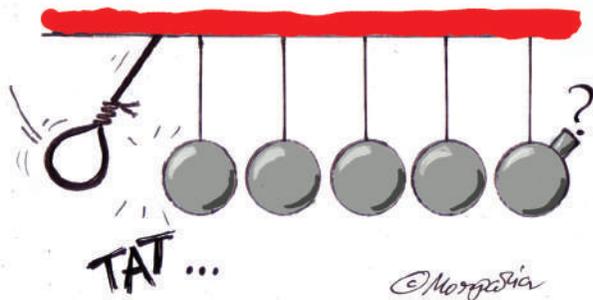
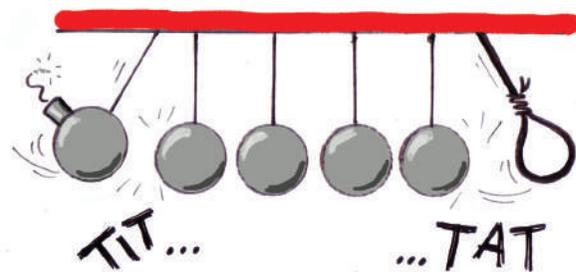
Monumental pollution

The Mind is just a garbage bin

When watchdogs are tame



MORPARIA'S PAGE



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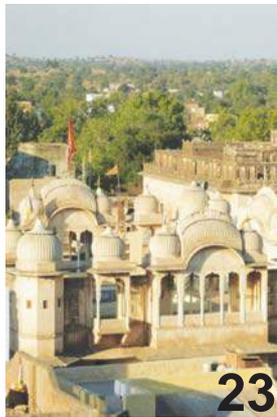
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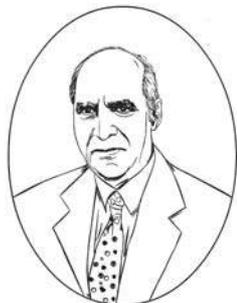


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Neeta Mohindra



K.P.P. Nambiar



S. V. Raju



Praful Bidwai

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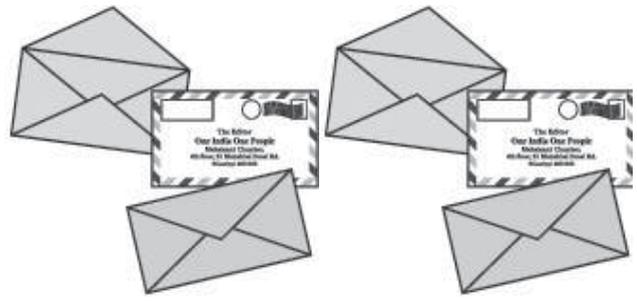
LETTERS TO THE EDITOR

We need a referendum on reservation

This is with reference to the article published in your esteemed monthly magazine of August 2014, 'Quotas - an electoral gimmick' by Dr. P M Kamath. Reservation is linked to casteism in our Indian society. I don't agree with Mr. Kamath that reservation has divided the society. Caste existed in ancient India. 'Annihilation of Caste' by Dr. B.R. Ambedkar is the best book for anyone who wants to know more on this topic. Reservation was maybe for 10 years Mr. Kamath.

But so long as the caste system and social inequality prevails in our society, reservation must continue. Reservation has benefitted the dalits and other backward classes who were oppressed and suppressed. Whether to continue reservation or discontinue it, the people of this country have to decide. The people are supreme in a democracy. Let there be a referendum on this issue.

– Sanjay Jayakumar Patravali
Dharwad.



Where the past and present meet

I really enjoyed reading the Know India Better article on Hyderabad by Gustasp and Jeroo Irani in your September issue. It was a really enjoyable article, written lucidly, with many anecdotes and details. The shenanigans of the Nawabs of Hyderabad never cease to amaze and the world they occupied is gone forever! The article has touched on all aspects of Hyderabad, including its delectable cuisine. There may be another more modern version of Hyderabad today, but the past nostalgically, continues to linger. Kudos to OIOP for highlighting such timeless cities. I hope to read more such features in your interesting magazine.

– Sreevalsan Menon, Mumbai

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Tribe, Tribal and Tribal Cricket

For all the fuss we make over our tribes and tribals, there was a time when they figured prominently in our cricket agenda, discovers V Gangadhar.

INDEPENDENT India had many problems to face from its infancy. These created tensions which led to divisions, sometimes leading to bloodshed, and figured prominently in the political agenda and in the Indian Constitution. But there was considerable goodwill for India. Many nations extended their hand in friendship and offered co-operation and economic aid. A huge, poor, over-populated, and newly-independent India suffered shortages of all kinds – food, fuel, technology, transport facilities, schools, roads, materials for primary education, in short, every essential component of life.

Yet, India battled on. Her sheer physical size, population and inspiring independence struggle under Gandhiji caught public attention. Despite poverty and other problems, poor India did not withdraw from the sports arena nor from international sporting events. Though not fully independent, our national cricket team undertook a full tour of England in 1946, and despite pangs of Partition, toured Australia in 1947-48. No one bothered that we were thrashed by Don Bradman's powerful team. The world admired how we rose to these challenges. In 1948-49, we hosted the West Indies team for a full tour.

Tours by foreign teams even then attracted huge crowds, but no tour was planned for 1949-50. Indian and foreign cricket authorities did not want to miss out on the financial bonanza of a 1949-50 winter tour. But with the international tour calendar full, no foreign country could tour India. The English winter was going barren and its cricketers were all set to lose a lucrative official foreign tour. English cricket brains came together and under former England wicketkeeper and Lancashire player, George Duckworth, planned a three-month unofficial Indian tour with players from cricket playing nations who were free and not committed to official matches. Though some of the top ranking English and Australian professionals were resting, there was a lot of talent available from these two nations (including former test players), besides star players from West Indies, New Zealand and so on. A powerful 17-member team was chosen with Duckworth as manager. 'Jock' Livingstone, former Australian

opener who played for Northamptonshire in English county cricket was made captain, the great West Indian batsman Frankie Worrell was the vice- captain and the team had enough variety and all round brilliance.

But for one name, George Tribe, an Australian all-rounder who had played three or four test matches for his country. The Indian cricket Board was puzzled at Tribe's inclusion because they did not know anything about him. Intrigued by his name 'Tribe', Indian Board officials wondered what kind of a tribal he was. Was he an Australian tribal, an untouchable, who would not be welcome in India? Was he a genuine Aborigine and kept out of Australian mainstream? How would he integrate with the rest of the Indian and Australian teams? Cricket, especially English cricket always had such divisions, like the "Players" and "Gentlemen", where the former played cricket for a livelihood and had to put up with an inferior status, while the 'gentlemen' played cricket for pleasure, were treated as royals and always led England. This led to strange anomalies.

The nation's top cricketers like Hutton, Compton or Alec Bedser (No. 1 bowler) could not share hotel accommodation with 'gentlemen' like Peter May, Norman Yardley, who were addressed as 'Sir' by the professionals. They had different entrances and exits from the ground.

It was clearly a caste system which existed well into the 1960's. A shadow of this was revealed in the 'Tribe' affair in India during the Commonwealth team's tour. But India was more tolerant. India's princes got along well with Tribe who returned to India with the next Commonwealth team. Tribe was not isolated, he visited palaces, monuments and other sights without any problems and performed brilliantly for his

team, which won the series. He was not interviewed by the Tribal authorities of the Government of India, nor taken to visit tribal colonies. It was clear he was a 'Tribe', but not a 'tribal'. That is INDIA FOR YOU! ■



The writer is a well-known satirist.

The sequel to pollution

From oceans filled with plastic garbage, to stars that we struggle to see in the sky, pollution is seeping into and corrupting every aspect of our lives. Human beings are responsible for this unmitigated disaster and now urgent measures are being taken to meet this crisis head on. But is this a case of too little too late? asks Akul Tripathi.

POLLUTION is today where climate change will be tomorrow. It is at the place where no one can deny it. For the simple reason that it is everywhere. The air we breathe, the water we drink, the food we eat and the roads we walk. True to the ancient aphorism of out of sight is out of mind, just like we hide away things inside cupboards and attics in a hurry to clear the house for guests, we try hard to get rid of all the waste that we can from front of us, in our daily lives, so that we don't have to see it around us, on a daily basis.

It would be wishful to think that all the garbage we generate, all the pollution we create, would just stay hidden there. Someday the cupboards will refuse to shut, someday the attic will overflow. Out of sight may make it out of mind and we can temporarily ignore it. How long though, is temporary? The consequences of this ostrich like hiding-the-face-in-sand behaviour are mounting fast - exponentially at that. Just beyond the line of sight.

Seas of plastic and oceans of ordure

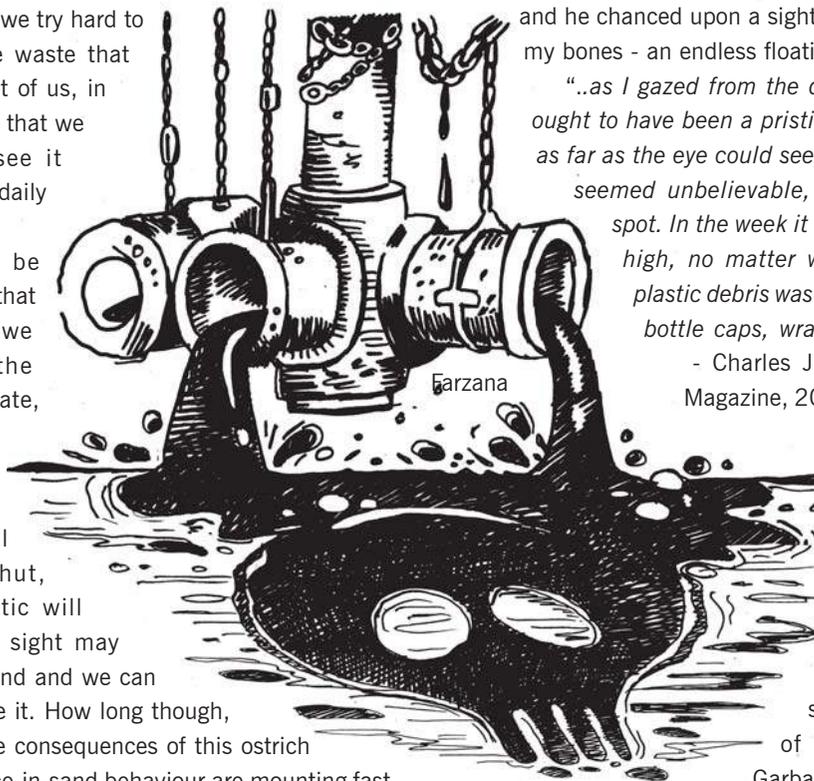
"One must be a sea", said German philosopher Friedrich Nietzsche, "to receive a polluted stream without becoming impure". Who could have thought that we could kill an ocean? But we are making good progress on it. The day is not far that we succeed in this impossible seeming task! For long we have believed the sea to be that ultimate cleanser. Dump everything in the ocean and forget about it. For decades going

on centuries, we have continued this practice of inserting cancer cells (our garbage) into the belly of the ocean and finally the symptoms have begun to show.

In 1999, racing boat enthusiast Capt. Charles J. Moore was returning home through the North Pacific Ocean and decided to go through a gyre (large system of rotating ocean currents) which fishermen avoided as there is poor catch, and he chanced upon a sight, the thought of which chills my bones - an endless floating waste of plastic trash.

"..as I gazed from the deck at the surface of what ought to have been a pristine ocean, I was confronted, as far as the eye could see, with the sight of plastic. It seemed unbelievable, but I never found a clear spot. In the week it took to cross the subtropical high, no matter what time of day I looked, plastic debris was floating everywhere: bottles, bottle caps, wrappers, fragments..."

- Charles J. Moore in Natural History Magazine, 2003



The Great Pacific Garbage Patch is a collection of marine debris in the North Pacific Ocean. Marine debris is litter that ends up in oceans, seas, and other large bodies of water. The Great Pacific Garbage Patch, also known as the

Pacific trash vortex, spans waters from the West Coast of North America to Japan. The patch actually comprises the Western Garbage Patch, located near Japan, and the Eastern Garbage Patch, located between the U.S. states of Hawaii and California.

The name conjures images of a floating island, something like the islands in the movie *Life of Pi*; only, horrific instead of beautiful. In reality, however, it is made up of tiny bits of plastic, called micro plastics which are invisible to the naked eye and also to satellite imagery, as it is suspended just below

the surface of water. Plastic, by its very nature is not biodegradable and instead of wearing down, they simply break into tinier and tinier pieces. The seafloor beneath the Great Pacific Garbage Patch may also be an underwater trash heap as it is estimated that 70% of marine debris sink to the bottom of the ocean.

Similar garbage patches have subsequently been discovered in all the major oceans, including the Indian Ocean. People who have seen these patches call them a kind of plastic soup with larger chunks of plastic items swimming in it. What is even more terrifying than the visuals these tales tell, is the fact that no one knows how much debris make the Great Pacific Garbage Patch or any other patches and nor do we have any estimates of the size of this disaster, as a lot of plastic floats centimetres and even metres beneath the surface.

It would be silly to even begin explaining the impact of all of this. The huge impact it has had and continues to have on all forms of marine life. To cut a long story short, let's just say that everything is within a circle of life - birds and fish feed on smaller fish and eventually the indigestible plastic will continue its march to eventually find its way back to us - in our tummies to be precise.

Startlingly, this sort of patch was already predicted in the mid 1980's and still matters were allowed to get so out of hand that the hypothesis today stands proved. Of course, now a plethora of laws have been thrown around and measures are being devised to arrest this problem. Yet it all reeks of too little, too late.

There has always been a chasm between laws and their implementation. However, this time, the fate of not individuals or races, but that of species hangs in the balance. So the next time you take comfort from the sight of the big deep blue, I hope the shadow of the evil lurking just beyond unnerves you, if only for a moment...

The end of night

To know of such slights to the home we live in, it is but natural to do what humans have always done - turn their heads skywards and take comfort from the forces that be. Smile at the twinkles in the sky and fill the heart with hope. But wait a minute. Where are the stars? All around, right up to the horizon is a haze of light fighting the little that is left of what was once the great inky black blanket with animated silver drops gliding through it.

Perhaps the least known types of pollution, but one with consequences as far reaching as any, is light pollution, also known as photo pollution or luminous pollution, which is largely the result of inappropriate and excessive use of artificial light that we fill in the areas we inhabit to allow us diurnal creatures to function for extended periods of time.

Light pollution is a side effect of our industrial civilisation. Its sources include building exterior and interior lighting, advertising, commercial properties, offices, factories, streetlights, and illuminated sporting venues. The fact is that much outdoor lighting used at night is inefficient, overly bright, poorly targeted, improperly shielded, and, in many cases, a completely unnecessary wastage of the light and electricity too.

For billions of years, the blue marble in the black void went merrily along lit only by the sun, moon and the stars. Its only in the last 100 years and incrementally within those to the last two to three decades, that light has become as much of a problem as a blessing. This engineering genius of lighting the planet that we have created, has its own share of consequences that affect the environment, wildlife and even humans.

A large number of species on the planet are nocturnal and to all species, light is a powerful biological force that acts as a magnet. Reports and studies are inundated with thousands of birds circling search lights and gas flares till they fall dead. Insects, as we all know, now cluster around streetlights and this has changed many feeding cycles. Birds are known to sing at unnatural hours and since longer days mean more time to feed, it has affected migration schedules. An increasingly persistent body of work is drawing parallels to various ailments in humans, like one that has found a higher rate of breast cancer among women who live in brightly lit neighbourhoods. Our own response to light and the way it affects our circadian rhythms, how it affects our sleep cycles are topics being studied in 'light' of the trappings of our modern world.

Solve and absolve

The mammoth scope and scale that these issues have assumed before we became aware of it is often intimidating. There is an immediate feeling of helplessness and of smallness against a gargantuan problem. As individuals, these are close to the most improbable situations that one can resolve. But there is no need to. The only absolution from this sin against nature is for every individual to abstain from it. Perhaps it is beyond each and every one of us on a personal basis to remedy this situation, but we can definitely take measures within our circles of influence to not be complicit in their furthering.

Not for some holier than thou ego trip or to step onto higher moral ground, but in hope of securing what were always



the simple and most easily found pleasures of life - drinking clean water, breathing fresh air, eating wholesome food and enjoying the magnificence of that divine celestial movie in the glory of unlit skies...■

The writer is a media professional and freelance writer.

When watchdogs are tame

The pollution control boards in India could have become really effective watchdogs, instead they are mostly ineffective, despite the powers and functions vested in them on paper. This situation really needs to change, says Leena Mehendale.

FROM time immemorial, Indian society has known the importance of keeping the quality of our land, water and air, pure. Vedas are replete with *diktats* on what needs to be done to keep these three *Panchmahabhuta* (the five natural elements air, water, soil, space and fire which combine to create a balance in nature) clean. The other two, namely sun and sky, were thought unpollutable by Man, hence very few references about them.

Creating the pollution watchdogs

After the advent of industrialisation, a strong need was felt to address the damage and pollution caused by it. The first consolidated action by the Government of India (GoI) came in the form of The Water (Prevention and Control of Pollution) Act, 1974. Under it, there is a provision for creating CPCB (Central Pollution Control Board) and other State level PCBs (SPCB). It is important to note that the CPCB or the SPCBs do not have the word “water” in their name, although their Authority comes from that Act. Later, as two more Acts were passed, namely, The Air (Prevention and Control of Pollution) Act of 1981, and the Environment (Protection) Act of 1986, the power and authority of the CPCB (and SPCBs) was expanded to cover the aspects of pollution like soil, air and noise. The beginning was good, so to say.

Thus the PCBs were vested with powers to control under the Water Act, Air Act and Environment Act. They cover a large number of polluting activities. In fact, theoretically, they cover all the activities known in the past and the present and whatever can arise in future, that can cause pollution. This is evident from a large number of rules and notifications brought out by GoI from time to time, which enhance the scope of the PCBs. Here is an impressive list from a wide range of subjects that these cover:

- pollution of water caused by industrial effluents
- air pollution through diesel engines and hence standards for gensets

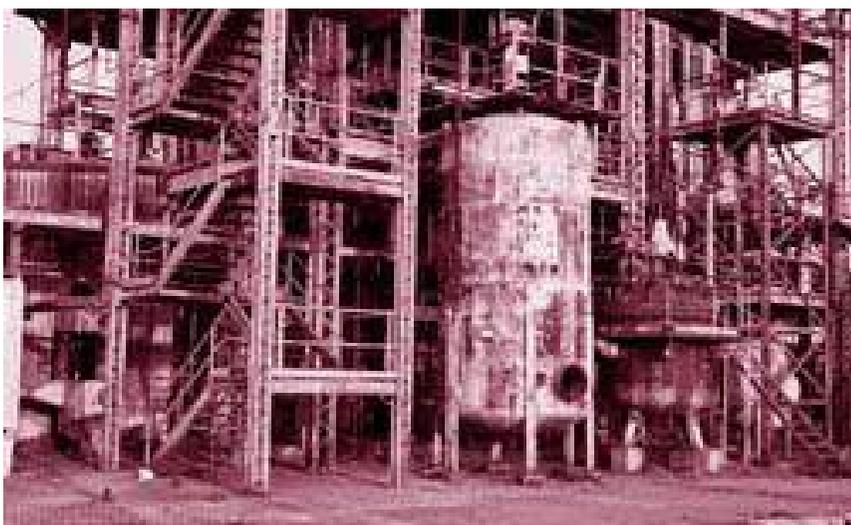
- noise pollution and fixing permitted decibel levels
- municipal waste
- biomedical, plastic and electronic waste
- waste from construction activity
- cigarette smoking in public places
- air or ambience polluting activities near Taj Mahal
- petroleum induced sea-pollution
- coastal pollution
- control of fly ash from thermal power stations
- local Acts for cleaning and conserving river basins such as those of Ganga, Godavari, and other rivers

Toothless watchdogs?

Some details about the functioning of PCBs are worth mentioning. The CPCB is supported by state boards and can create suitable arrangements for Union Territories. It has the support from testing laboratories under the government and can also authorise other labs for testing specific aspects of pollution. Already it has recognised nearly 150 labs across the country. All the three Acts give elaborate authority and procedure to the officers and the Boards to set up standards, receive complaints, collect samples and get them tested from the labs, and initiate civil and criminal cases against persons who cause pollution. In addition, the parent ministry, namely, the Ministry of Environment and Forests has passed yet another Act and set up Environment Tribunals which can hear individuals or public litigations, and can order compensation and penalty for those causing pollution.

Despite such elaborate legal framework, authority, infrastructure, manpower resources, and budget for the PCBs, the pollution of water, soil, air, environment remains unabated. A common citizen is at a loss to understand the reasons for failure to control pollution. The worst failure of all was the Bhopal gas tragedy that will perhaps remain unparalleled in history, for its violation of all safety norms for air and environment protection. It was a failure of

Under the present Environment Protection Acts, the Boards (but not its officers) have authority to refuse certain permissions to the industry, but there is no prescribed action against those who carry out their operations without seeking permission.



The Union Carbide factory in Bhopal had flouted all environmental rules and was the site for the worst industrial disaster in India. It lies abandoned today

implementation as well as of effectively penalising the culprits and adequately compensating the losses, and reveals the glaring defects in the working of these Acts and their administrative or legal back-up.

Apart from such tragedies, the routinely known failure of these Acts comes from the huge pollution caused by industrial effluents, be it from chemical industries, sugar factories, tanneries, pesticide factories etc. The Boards are virtually powerless when confronting big industrial houses causing these. There are reasons for this. First, the inadequacy of functions entrusted and authority granted to the Boards. What are they? The concerned chapters on functions under each Act elaborates them. They are essentially:

- Power to enter any industrial premise suspected to cause pollution
- Power of inspection
- Power to take samples and send them to laboratory
- After receiving lab report, to file FIR and when the case comes up for hearing, attend the court to assist them to punish the guilty

This shows that the Boards only have “nuisance” power as their officers can inspect and collect samples. Beyond that, the Boards are powerless even when the pollution is visible. Secondly, the procedure laid down for collecting samples, their proper packaging and sending to the lab for testing is again too elaborate and time consuming. There is no power to punish or stop a very obviously happening pollution. Once the lab reports arrive and if an individual or agency is found guilty, an FIR is lodged against the guilty, and the matter is handed over to the police who routinely investigate the case, often without understanding the technical aspects of that

particular pollution. After the investigation is complete, the police file a case in the court. The authority for imposing financial penalty or imprisonment lies solely with the court. Additionally, the Board officers are not declared as investigating officers.

Under the present Environment Protection Acts, the Boards (but not its officers) have authority to refuse certain permissions to the industry, but there is no prescribed action against those who carry out their operations without seeking permission. Thus what seems and is often projected as a wide authority of the Boards is often of little consequence if the industry chooses to flout rules.

No real time solution

The Indian judicial system goes by the principle of separation of power. Thus, the investigating officers, the courts and the authority to implement punishment are three separate entities. Creation of PCBs has added a fourth entity. All this is too much of division of labour which becomes completely ineffective while dealing with small-level violations, where quick punitive action is the key to the visibility and effectiveness of the system. Today, equally elaborate procedure is required to be followed for dealing with both small and major violations. Hence, the focus remains on minor violations where the Board officers are able to demonstrate some “nuisance power”.

Another reason why PCBs have remained ineffective is that they seek to resolve the complete problem in one go, rather than dissecting the problem into several sub-problems and solving at least some so that they achieve part improvement. Declaring Board officers as Investigating Officers under CrPC is one such example. There are many more, smaller measures which can bring only about 10% improvement, but at a small budget and very little lag-time. Boards, while waiting for big ideas have often ignored them. Hence they fail to provide any real-time solution to our huge problem of pollution.

What is described above are the functional lacunae of the Acts and the working of the PCBs. But a much bigger issue often remains unaddressed. We can see that lots of efforts have gone into creating these laws and forming the Boards. A huge legal framework is created, and enough physical infrastructure, budget, and manpower have been put in place. Yet, the outcome is poor. This is because our regulatory and punitive agencies, modeled after the British system, are totally segregated from any role as an educator or researcher.

(Continued on page 39)

The looming crisis

Indian cities are reporting dangerously high levels of air pollution. Around 35 percent school-going children in Indian cities suffer from poor lung health due to breathing polluted air. Delhi tops the list of the world's most polluted cities, where almost 80 lives are lost daily due to pollution. In fact, 13 of the top-20 most polluted cities in the world are in India, says Nidhi Jamwal, ringing the alarm bell.

INDIAN cities, the engines of our growth, are choking the citizens on high air pollution, reducing their life expectancy, and destroying the health of the young children. Report after report, survey after survey (both national and international), show the ghastly manner in which suspended particulate matter (SPM) pollution is rising in the Indian cities and increasing the disease burden. Health experts and environmentalists are already warning of an emerging public health crisis if immediate and strict measures are not introduced to control the rising pollution.

No breathing easy here

Take the survey *BreatheBlue'15*, jointly conducted by HEAL Foundation and Breathe Blue as part of the Clean Air India Movement (CLAIM). Released four months ago, this nation-wide survey included 2,000 school students aged 8-14 years from various Indian cities and mapped the effects of air pollution on the breathing capacity of these young children using the Lung Health Screening Test (LHST). This test determines how much air the lungs can hold, how quickly one can move air in and out of one's lungs, and how well the lungs take oxygen in and remove carbon dioxide from the body. Poor results on LHST mean compromised lung function and high possibilities of contracting pulmonary diseases.

The results of *BreatheBlue'15* are extremely worrisome. Around 35 percent school-going children in India suffer from poor lung health with the national capital topping the list with 21 percent children having 'poor' lung capacity. The second worst city whose air is choking its children is Bengaluru (14 percent 'poor'), followed by Mumbai (13 percent 'poor') and Kolkata (9 percent 'poor').

This is not the only survey that has shown the grave impact of air pollution on the health of urban children. Another landmark study by Kolkata-based Chittaranjan National Cancer Institute, which spanned over three years and tracked 11,000 school children in Delhi region, found that key indicators of respiratory health, lung function to palpitation, vision to blood pressure, were worse off in children of Delhi (between four and 17 years of age), than their counterparts elsewhere, because of high air pollution.

No wonder then in April this year, several doctors in Delhi had only one prescription for the patients suffering from severe respiratory problems – “Leave Delhi”. Delhi’s air, which is a concoction of various toxins and pollutants, was worsening the medical condition of city-residents, especially children, who cough and wheeze each night, warned the doctors.

“Leave Delhi”

No wonder then in April this year, several doctors in Delhi had only one prescription for the patients suffering from severe respiratory problems – “Leave Delhi”. Delhi's air, which is a concoction of various toxins and pollutants, was worsening the medical condition of city-residents, especially children, who cough and wheeze each night, warned the doctors. Data from city-based hospitals is enough to ring the warning bells. For instance, the All India Institute of Medical Sciences (AIIMS) has seen a whopping 300 percent rise in respiratory illness cases between 2007-08 and 2013-14. The cases in Vallabhbai Patel Chest Institute (VPCI), too, have shot up from 47,887 to 65,122 during the same time period. Private hospitals have reported an increase (up to 35 percent) in respiratory ailments during the winter months of October-December, when smog sets in, as against July-August last year.

The rise in respiratory ailments in Delhi corresponds to the rise of air pollution levels in the city. The respirable suspended particulate matter (RSPM) levels in Delhi have gone up from 201 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) in 2008, to 316 $\mu\text{g}/\text{m}^3$ in 2014, nearly 16 times what is considered healthy by the World Health Organization

(WHO). RSPMs are tiny and toxic pollutants produced by vehicles and industries, which when inhaled cling to the lungs and cause various respiratory diseases.

Last May, the WHO, too, had voiced concern over the high air pollution levels in Delhi, when the capital was named the world's most polluted city in the 'Ambient (Outdoor) Air Pollution in Cities Database 2014' released by the health organisation. The WHO's database of ambient air pollution monitoring from 1,600 cities in 91 countries, covering the period from 2008 to 2013, found the annual average PM2.5 (particulate matter smaller than 2.5 microns) level in Delhi to be as high as 153 $\mu\text{g}/\text{m}^3$, which is six times the WHO's recommended maximum and 12 times the US standards (see figure: *The world's most polluted cities*).

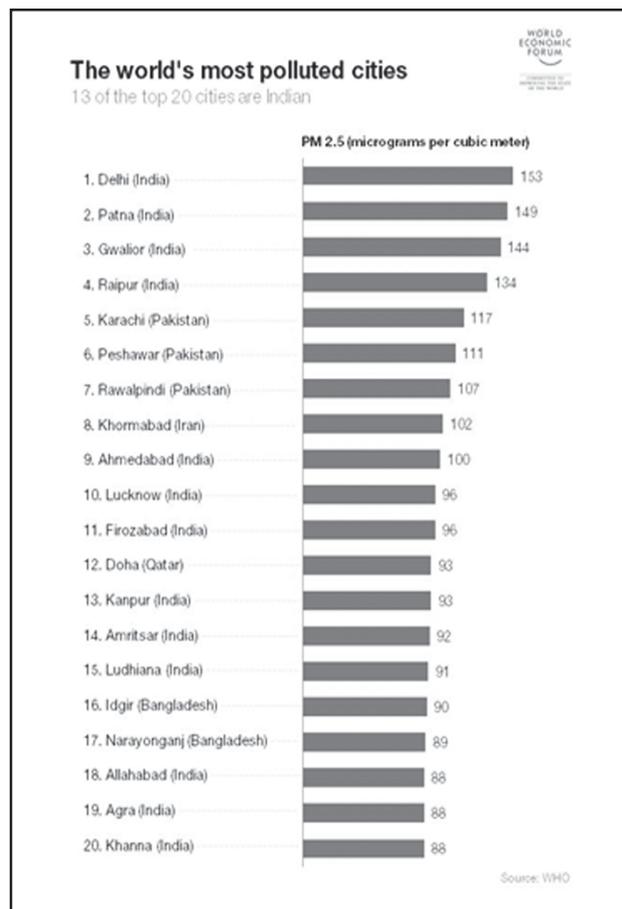
Can Delhi achieve another miracle?

It isn't that efforts have not been made in the past to clean the air in Indian cities. Delhi, at least, had a very strong movement against air pollution, which led to some significant results. In 1998, the Supreme Court of India ordered all public transport in the city to switch to compressed natural gas (CNG), a cleaner fuel as compared to petrol and diesel. This not only brought down pollution levels in the city, but also helped register a decline in respiratory illness cases. From a high of 409 $\mu\text{g}/\text{m}^3$ in 1995, the RSPM went down to 191 $\mu\text{g}/\text{m}^3$ in 2000, and then further to 161 $\mu\text{g}/\text{m}^3$ in 2007. At VPCI, the number of OPD cases dipped from 51,694 in 2003-04 to 47,887 in 2006-07. However, 2008 onwards, things started to change and have now reached a stage when RSPM levels in Delhi are again high at 316 $\mu\text{g}/\text{m}^3$.

Environment organisations, such as New Delhi-based Centre for Science and Environment (CSE) that fought a long and difficult battle to switch city's public transport to CNG and implement other reforms, feel the advantage of CNG-switch have been lost due to the sheer number of vehicles that are added to Delhi's roads every day – i.e. 1,400 vehicles per day. Apart from the private cars, another source of pollution in Delhi is the daily exhaust of 80,000 trucks that keep moving in and out of the city during the night time. Most of these trucks are 10 to 20 years old and run on a mixture of diesel and kerosene, spewing toxins into the air.

The story of rising air pollution in other Indian cities isn't any different, as ownership of private vehicles is on the rise and emission standards are weak. "The current regime of vehicle technology, fuel standards, and high growth rate of private vehicles, is likely to nullify all the past emission reductions by the end of 2020s," warns a scientific study by Rahul Goel of IIT Delhi and Sarath K. Guttikunda of IIT Mumbai.

Another study published in *Economic & Political Weekly* has calculated that 660 million people in India now live in



areas where PM2.5 levels exceed the country's national ambient air-quality standards. This is reducing people's life expectancy by 3.2 years. Yet another study reports that air pollution in Delhi kills approximately 20,000 to 30,000 people annually. This means 80 deaths every day due to pollution. And, majority of these are due to heart attacks and strokes, and not respiratory disorders. About 45 per cent of these premature deaths could be controlled if Delhi meets the national ambient air quality standard of 60 $\mu\text{g}/\text{m}^3$ for PM2.5.

While health experts and environmentalists are raising a battle cry against air pollution, the Indian government and city-level authorities are yet to acknowledge the public health threat of pollution and formulate an action plan. Controlling the rising levels of air pollution in Indian cities will require some hard decisions and strict implementation. Any more 'wait and watch' gimmick will cost us the future, as the health of our children is already compromised. ■



The writer is a freelance journalist from Mumbai who reports on the environment. Her Twitter handle is @JamwalNidhi.

The sluggish flow

We dump everything from raw sewage to untreated industrial effluents into our rivers despite investing heavily in treatment plants, which in most cases are also dysfunctional. Should we wait till all our rivers are reduced to toxic sludges before we take urgent action? asks a concerned Tirtho Banerjee.

WHEN a recent Central Pollution Control Board (CPCB) report revealed that the number of polluted rivers in India has gone up from 121 to 275 in the last five years, there were the customary knee-jerk reactions from the civil society groups and eco activists. The startling survey was quoted in a series of environmental forums and green campaigns to jolt the policy makers. It did create a lot of furore, but things were back to square one once the dust settled. Even as Prime Minister Narendra Modi is obsessed with his Ganga clean-up rhetoric, the pollution load in rivers like Narmada, Krishna, Sabarmati, Cauvery, Gaggar, Sone, Godavari and Yamuna – to name a few – is shooting up as is the fallout from their gross neglect. Every river is reeling under a host of problems and at the root of these is political as well as public apathy and sheer mismanagement of resources.

A cocktail of sewage, industrial waste and pesticides

What can you expect if most of the sewage treatment plants lie like white elephants and the ones that work don't have the capacity to treat the human waste fully; if untreated industrial effluents are dumped into the water bodies with rank impunity; if agricultural run offs – that are laced with obnoxious chemical fertilisers – find their way into the rivers. No wonder then that this toxic cocktail makes an ideal recipe for the aquatic creatures' slow and painful death. As the population of our cities grows rapidly, so will the generation of waste. To tackle this waste, we need to have efficient treatment plants that can work round-the-clock. Two years back, the CPCB found out that not even 50% of the installed capacity of the existing sewage treatment plants across the country was being used, and over 30% of the machinery was non-operational. In Delhi alone, the Comptroller and Auditor General of India (CAG) found that 15 out of 32 sewage treatment plants were working below their capacities. Delhi Jal Board is collecting and treating only 54% of the total sewage generated in the city. Therefore, it is the inefficiency, not insufficiency, of the treatment plants that is deteriorating the river quality. Similar is the case with effluent treatment



Free discharge of effluents into river bodies have led to the bad health of our rivers

plants (ETPs). Take for instance the tanneries in Kanpur. Even though ETPs are in place, they are unable to function properly due to frequent power outages. Many of them are ill-maintained. As a result, the waste leaches into the soil and makes the groundwater unhealthy too.

The sewage generated from 650 cities and towns situated along the 302 polluted river stretches have increased from 38,000 million litres per day (MLD) in 2009 to 62,000 MLD today, the recent CPCB assessment pointed out. In 2013, PCB surveyed 51 of the 64 existing sewage treatment plants along the Ganga. Only 60% of the installed capacity was being used. Until and unless sewage and effluent treatment plants are properly managed and used to their optimum, the revival of our rivers will remain a dream. A fortune has gone down the drain in Ganga Action Plan (GAP) and Yamuna Action Plan (YAP). Now is the time to hand over the management of treatment plants to private players. They will be able to do the job efficiently by cutting through corruption and ineptness. These enterprises should apply modern technologies and take a futuristic view with their eye on cost-effectiveness of their investments. It is also imperative that the union budgets allocate a large chunk for toilets and sanitation facilities so that the river pollution is checked at the source.

Pumping in money in clean technologies is good, but it is more important to take steps that ensure that the problems are prevented and nipped in the bud. The enormous toxicity of our rivers came to the fore when a few years back, many *gharia*s (alligators) died in the Chambal river basin in Madhya Pradesh as the dissolved oxygen plummeted alarmingly. Such deaths can be stopped if there is regular monitoring of water samples. Bacterial contamination in most of India's rivers is getting higher and higher. As the coliform levels of our rivers increase, we have to bring in legislations that make it mandatory for the departments and stakeholders concerned to analyse the water samples scientifically on a weekly basis. The polluting industries can then be tracked and nailed. This will also help us stem the outbreak of water-borne diseases. While the industrial discharge is the second biggest contributor to contamination after sewage, pesticides come in a close third. Farmers continue to use chemical fertilisers like DDT that are globally banned. As a result, rivers are choking and gasping for breath. In 2008, a study by PGIMER and Punjab Pollution Control Board found that in villages, fluoride, mercury, endosulphan and heptachlor pesticide were beyond the permissible limit in ground and tap waters. The water was also high in ammonia, phosphate, chloride, arsenic, chromium and chlorpyrifos pesticide. In Narmada, the use of nitrogen fertilisers is rampant in the basin area. By some estimates, its annual use is 140,000 tons. Whether it is the Vidharbha farmers or their counterparts in Punjab, the farming fraternity has to realise the old wisdom that earth is our mother and it has to be taken care of. If organic farming is given impetus by the government, water pollution can be reduced to a large extent.

Damn the dams

When big dams are made, they reduce the environmental flow of the river. River experts aver that every river has a quality to purify itself, but if the quantity of its water is decreased, it hampers the natural process. Deforestation in the catchment areas causes sedimentation, further aggravating the situation. Dams upstream on the Alakananda, Bhagirathi and Mandakini rivers have affected Ganga's flow downstream. Tehri dam has reduced the flow of the river. It's alarming but true that the Damodar river catchment areas are havens for coal mining. The resultant pollutants have turned the river

What can you expect if most of the sewage treatment plants lie like white elephants and the ones that work don't have the capacity to treat the human waste fully; if untreated industrial effluents are dumped into the water bodies with rank impunity; if agricultural run offs – that are laced with obnoxious chemical fertilisers – find their way into the rivers.

into a chemical cesspool. There are attempts to build a number of big and small dams to harness Narmada waters. Tawa dam has already cleared 24,000 hectares of forest cover. As forests are felled, the water level of Narmada gets reduced and poses danger during floods.

In many places, water is channelised for agricultural purposes, which causes the river to go dry. Irrigation and electricity are important, however, the price that we are paying for it far outweighs its benefits. It is a terrible tragedy that most of the development taking place today is marginalising the poor and wreaking havoc on their livelihoods. The challenge for India is that it has to stride ahead on the progress path, but at the same time not become oblivious to the long-term impact of plans that entail lopsided development and give short shrift to ecological concerns, while also fuelling inequities.

Coordinated effort - the need of the hour

Today, almost all river cleaning projects in India suffer from lack of coordination among the different departments that are involved in it. All are working on the same thing, but in isolation. The multiple agencies need to work in tandem. While the ministry of urban development can stop encroachment near the rivers, the water department can devise a strategy that prevents drains falling into the rivers directly. Coordination between various state governments is also necessary. If Haryana doesn't release enough water into Yamuna, the pollution in the river in Delhi will continue. India has less than two percent of the world's freshwater resources and it sustains five percent of the world's population. The more we pollute water, the more we limit its availability for

consumption and agriculture. If the current trend continues and laws are flouted with impunity, a time will come when most of our rivers will be consigned to the pages of history. The few that flow like gutters will unleash health hazards.



We need to think about the unhealthy legacy that we are leaving behind, while there is still time to reflect and redress. The vicious cycle of pollution can only be broken only when we shed our myopia and become enlightened from within. ■

The writer is a freelance journalist who specialises in environmental issues.

Groundwater – a fast depleting safe deposit!

We think the supply of water is unlimited. If surface water is not available, we will tap underground resources. But given the fast depletion of underground water and its pollution by industrial and agricultural chemicals, we are not left with much choice, warns Nitya Jacob.

WATER comes in three forms usable to human life. Surface water, comprising rivers and lakes. Rainwater from the skies, and groundwater from under the earth's surface. For most part, human civilisation has depended on surface and groundwater for its survival, and rainwater for agriculture. The three sources are therefore closely linked – rainwater is the only source of fresh (non-salty) water that is suitable for life.

Groundwater exists under the surface of the earth in reservoirs called aquifers. Made of porous rock or underground caverns these are filled by water seeping from the surface through recharge zones. The process can take a few days or a few millennia depending on the nature of the aquifer, depth, geology and quantity of rainfall. It also depends on the surface conditions – whether they are forested, hilly, barren, sandy or cemented as in cities.

In a typical situation, where the surface of the earth is forested, about 7-9 per cent of the rain that falls on the surface gets absorbed by the earth and finds its way into aquifers. Shallow aquifers are filled first, while deeper ones can take much longer and depend on the conditions at their recharge zones. Therefore, a deep aquifer may have a recharge zone that is several kilometres away in a hill range or other geological structure. Hydro-geological mapping can help determine this.

The rest of the rain runs off into rivers or evaporates. Unless augmented by watershed treatment, most rainwater is lost to the sea. It is not wasted as it goes to support life in rivers and lakes en route the ocean. However, it's not available for human use.

Depleting water, contaminated water

India faces a water emergency now of enormous proportions. In the north especially, studies have indicated the disappearance of groundwater worth 116 cubic kilometres in

the past decade. That means Rajasthan, Haryana, Punjab, Uttar Pradesh and parts of Madhya Pradesh have overdrawn groundwater by this amount. More than 80 per cent of this would have gone to farming with domestic use, industry and energy using the other 20 per cent. If that sounds trifling, consider this: that is enough water to cover the entire state of Chattisgarh with water



The pesticide and fertiliser runoffs from agriculture are polluting our groundwater

one metre deep.

The disappearance means there is a water imbalance in these states; they are pumping out more than what is going in. This has implications for the short and medium-term water security. In the short term, wells will dry up and the shallow hand pumps installed as political sops will start failing, as aquifers start getting deeper. In the medium term, deeper wells that are now used mostly for drinking will start going

dry. This means drinking water will get that much harder to reach. In the long term, once the Himalayan glaciers have melted, water will become scarce. This will be exacerbated by the inadequate and insufficient rains.

Along with the shortage of quantity, quality of groundwater has been rapidly degrading. In many parts of the country, groundwater comes laced with fluoride bearing chemicals. In many other parts, the water is too salty to be consumed, or has fluoride. In both cases, treatment is needed before being distributed for drinking.

Chemical contaminants are lethal. Both arsenic and fluoride affect the human body in different way but ultimately lead to death. Both are naturally occurring elements that leach into groundwater and then are pumped up for human resource. The issue has become more severe as groundwater is being tapped from greater depths. This water that has travelled greater distances below the earth and is often called fossil water as it has spent centuries below ground and has had a long time to dissolve minerals that make it toxic.

Modern agriculture, industry and urbanisation are three major sources of man-made pollution. Agriculture uses pesticides and fertilisers usually in excess of what is needed. The water used for irrigation percolates back into the ground while some runs off into rivers and lakes. In both cases it contaminates the groundwater with pesticides and fertilisers. These are harmful to human health. One of the manifestations of this is in Punjab where in several districts the groundwater is so severely damaged, it is unfit for drinking. In Bhatinda, water for municipal supply is treated with reverse osmosis before being supplied, as cancer rates in the town and district have shot up largely because of contaminated groundwater.

Industrial pollution has severely contaminated groundwater in several areas. Under the water pollution act, industries are required to install pollution control equipment to bring the bio-chemical oxygen demand, a measure of pollution, below stipulated norms. This is an expensive process and industries mostly get away by bribing pollution control officials and injecting toxic waste into the ground to escape detection. The second activity has turned groundwater toxic in several parts of India such as along the Hindon and Ramganga rivers in Uttar Pradesh, Pali district in Rajasthan, the Musi river in Hyderabad and the Yamuna in Delhi.

Urbanisation has picked up speed in India. In the last Census about 3,400 new towns were identified. Existing cities

and towns have also grown rapidly and now a third of the country lives in urban areas. They cumulatively generate about 50,000 million litres of sewage every day. In an ideal situation this would be treated to river water quality before being discharged into water courses. India does not have the capacity to do so. The total sewage treatment capacity can handle about 30 per cent of this volume. Actual treatment is estimated at between 17 per cent and 22 per cent. That means about 40,000 million litres of raw sewage is discharged into rivers every day. This has polluted 75 per cent of the country's surface water and will inevitably lead to groundwater deterioration.

The writing is on the wall

So what is the big deal? The big deal is we get 80 per cent of our drinking water from groundwater. The big deal is we drink groundwater without treatment, assuming it to be safe. The big deal is we are running out of this resource that ought to have been held in reserve, instead of being the first to be used. It is the fixed deposit of water that is being exhausted and degraded, instead of using the savings account. Fixed deposits are hard to replace when depleted.

Groundwater pollution is impossible or extremely costly to fix. Aquifers can run for hundreds of kilometres underground. Pumping out all their water is difficult and costly. Treating and injecting it back into the earth is also equally difficult and costly. But the criminal industries polluting groundwater think nothing of this, neither do the officials complicit in this activity.

We need to do the following

- Shift back to surface or shallow groundwater for drinking purposes, suitably protected from pollution and treated
- Improve all irrigation infrastructure so reliance on groundwater is reduced
- Ensure strict enforcement of pollution control regulations
- Do widespread rainwater harvesting and watershed treatment to augment groundwater recharge



The writer is a research and policy advocacy professional and author with in-depth knowledge of the water sector. He was also the head, policy advocacy and research wing at WaterAid India, a leading NGO.

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Monumental pollution

Air pollution doesn't just affect our lungs and health. It is increasingly affecting the health of our historic, celebrated monuments like the Taj Mahal and the Charminar. Why are our heritage structures getting affected causes it and what is the solution? A team of researchers from the Vardhaman College of Engineering in Andhra Pradesh have submitted a report.

WITH the advent of industrial revolution, degradation of buildings has become a reality. Though there are many reasons for the degradation, the principal reason may be attributed to air pollution. The air pollution in the form of acid rain is chiefly responsible. The pollutants that are principally responsible for acid rain are sulphur dioxide and nitrogen dioxides. These two are emitted from the combustion of fossil fuels like coal and oil. The rapid industrialisation has encouraged the quantity of these emissions.

In fact, almost all materials are affected by the deposition of acid, but the degree of damage or intensity may vary. Some of them are more susceptible to its effects such as carbon, steel, zinc, nickel, limestone, marble, paints and some plastics.



Effects of air pollution

Corrosion causing acids may attack the material both in wet and dry forms. Some of the pollutants in the gaseous form may fall close to the source of emissions causing direct damage. Sulphur dioxide frequently falls as dry deposition within 30 km of its source. Wet deposition of acids occurs when the pollutants are released in atmosphere. They react with water vapor present in clouds to form dilute acids. Sulphur dioxide, nitrogen dioxide and carbon dioxide are the most responsible pollutants causing damage to the material. The intensity of damage caused by sulphur dioxide is more compared to the other pollutants. Sulphuric acid mist in the atmosphere causes deterioration of structural materials such as marble sculptures, and buildings have suffered damage in the last 30 years as a result of increased sulphur dioxide content in the atmosphere.

The damage due to air pollution on materials is really a serious concern, since the service life of buildings is remarkably reduced. It is true that the intensity of manmade pollutants on building degradation is more than the impact of natural pollutants. Most important, the effects of soiling,

The ethereal Taj Mahal is turning yellow due to air pollution

degradation, corrosion and erosion caused by sulphur dioxide are very serious.

How does pollution affect our ancient monuments?

Most of the research studies reveal that the effect of acid deposition on modern structures is significantly less than the effect on ancient monuments. Almost all heritage structures are built with limestone and calcareous stones, which are most vulnerable to corrosion. Hence, continuous renovation and retrofitting is a must to protect our heritage. The historic structures all around the world are affected by acid rain.

The Taj Mahal, one of the Seven Wonders of the World, and India's pride, greatest land mark is also being threatened from air and water pollution. The report submitted by the National Environment Engineering Research Institute shows how the 17th century monument is being damaged by air and water pollution. This is happening even after the remedial measures taken by the government.

The Ministry of Environment, Government of India, has conducted a survey to find out the facts of pollution on the

celebrated tomb. The report has revealed that the pollution levels in terms of both air and water have risen to most significant and dangerous levels, as a result of accelerated growth in industry, traffic and population. Illegal and irrational constructions are springing up around the Taj Mahal, the heavily polluted water of the river Yamuna are also causing serious damage to the monument. An air pollution control programme was launched in 1998, when it was found the monument's famous and peculiar white marble was turning yellow. The then American President Bill Clinton made an interesting statement that pollution had done, "what 350 years of wars, invasions and natural disasters have failed to do and begun to mar the magnificent walls of the Taj Mahal".

A series of serious measures have been taken including banning vehicles till 500 meters away from the structure. It was also noticed that the fluctuations in ground water table have been threatening the structure and the water in the river Yamuna is continuously polluted by the discharge of effluents. Many experts declared that the measurable Total Particulate Suspended Matter (TSPM), Respirable Suspended Particulate Matter (RSPM) and oxides of sulphur and nitrogen are all posing huge threats to the ancient monument. According to Suryanarayana Murthy, a conservation architect, the organic matter that settle on the structure along with the dust leads to moth formation due to rains.

A few other monuments which are victims of environmental pollution are the Charminar, the Jama Masjid, Mecca Masjid and so on. Architects notice that high levels of the TSPM are the biggest threat to monuments. It was also identified by Murthy that the formation of the layer happens much faster on structures with a rough surface as in the case of the Mecca Masjid, compared to the structure with smooth and plastered surfaces like Charminar.

The Charminar, which is an iconic monument of Hyderabad, has been suffering from the deadly effects of air pollution. It was identified that the minarets of the monuments have developed air cracks at some places. It was decided by the Archaeological Survey of India (ASI) to take up repair activities at a cost of ₹10 lakh. In fact, ASI is authorised to look after its maintenance and it has also planned to take up a chemical wash of Charminar. According to available sources, it is believed that the air cracks formed might be the result of



The famous Charminar of Hyderabad is badly affected by pollution

Illegal and irrational constructions are springing up around the Taj Mahal, the heavily polluted water of the river Yamuna are also causing serious damage to the monument.

climatic change. The seepage of rain water and the dampness have also shown their impact on air cracks. The ASI has also identified that the vibrations produced by relentless movement of vehicles around it are not good for the Charminar. Hence, the ASI started an awareness programme called "Charminar Pedestrianisation Project" to divert traffic away from Charminar.

Conclusion

The present contribution showed a general description on the current state of some of the historical structures. As far as the pollution on materials is concerned, the tropical climate with the presence of natural pollutants create conditions for deterioration of both metals and rocky materials. In fact, the present situation of historical structures is at critical junction. It is necessary that the government should initiate substantial measures to control the damage of structures. The awareness among the public is also important to stimulate the concerned authorities to initiate control and remedial measures. This paper tries to place the facts and bring awareness among the public and authorities. ■

The research paper *Detrimental effect of Air pollution, Corrosion on Building Materials and Historical Structures* by N. Venkat Rao, M. Rajasekhar and Dr. G. Chinna Rao from the Vardhaman College of Engineering, Andhra Pradesh, appeared in the American Journal of Engineering Research (AJER) in 2014 (www.ajer.org). We have carried excerpts from the paper here with the permission of M. Rajasekhar.

The silent killer of the rural kitchen

One of the least acknowledged forms of pollution is the kitchen pollution in rural India. The smoke from the burning of biomass fuels causes severe respiratory and other diseases in women. Dr. Ramakrishna Muley writes about this issue and the life-altering benefits of the smokeless chulha invented by his institute.

ENERGY is the prime mover of economic growth and it is a wheel of modern economy. Future economic growth crucially depends on the long-term availability of energy. India is a developing country and it needs more energy to accelerate the rate of development. India is the sixth most energy consuming country in the world. The energy resource is constant, but energy consumption increases day by day. So each country requires more energy efficient equipment for their development.

There are three ways for efficient energy conversion

- (a) Discover new energy resources
- (b) Minimise the energy losses
- (c) Waste heat recovery

The health hazards

More than 70% of Indians live in rural areas and they use traditional wood burning *chulha* (stove) for cooking their food. This type of *chulha* currently in use in villages operates at an efficiency level as low as 6-8%. This results in increase in demand of firewood that accelerates the felling of wood, resulting in deforestation. This has a disastrous effect on people's health. Respiratory illness affects the health of a huge number of low-income people living in rural, underserved areas of the world, who still cook indoors with biomass fuels (e.g., wood, crop residue, charcoal or dung). Nearly 2.4 billion people, which is more than 1/3rd of the entire global population, use biomass as their primary source of energy for cooking and heating.

Smoke from the traditional *chulhas* during cooking is one of the major causes for ill health of rural women and children. Acute Lower Respiratory Infections (ALRI) refers to various infections of lower respiratory tract mainly caused by bacteria in developing countries - the most serious case of which is pneumonia. According to WHO, 36 per cent of all ALRI is attributed to Indoor Air Pollution (IAP) from the use of biomass fuels for cooking, heating and light. In a typical household

cooking with biomass fuels, the level of particulate matter (LOPM), which is one of the health damaging pollutants due to IAP, is as high as two to twenty times higher than what the US Environmental Protection Agency (USEPA) considers a safe level and ALRI is not the only burden due to IAP. Studies have shown that Chronic Obstructive Pulmonary Disease (COPD) in women above 45 years has a strong and consistent association with IAP. COPD is estimated to claim 106,000 Indians every year. Other outcomes for which evidence is moderate or tentative, include asthma, low birth weight, tuberculosis, cataract, parental prenatal mortality, nasopharyngeal cancer and laryngeal cancer.

A *chulha* which doesn't smoke!

However, with a little effort, it is possible to increase the thermal efficiency of these *chulhas* considerably. The smokeless *chulha* is a low-tech solution to enable healthy indoor cooking. This *chulha* has been developed to fight the ill-effects of indoor air-pollution, a silent threat.

Energy efficient smokeless *chulha* would reduce:

- Firewood consumption substantially
- Pressure on CPR/forest
- Time and effort on collection of firewood
- Smoke related health hazard as women are at high risk due to long exposure to smoke
- Environmental hazard, and thereby make their utility economical & efficient

Benefits of the *chulha*

Social benefits:

- Less time spent cooking and collecting wood
- Reduction in indoor air pollution means healthier women and healthier families
- The slow cooking *chulha* fits the lifestyle and nutritional needs well



The smoking *chulha* causes many respiratory ailments among rural women and children

- More living space up as less firewood stored

Environmental benefits

- Lower fuel wood consumption. It uses up to 50% less firewood than traditional *chulha*
- Less need to cut trees for firewood, therefore increased green cover
- Reduced carbon emissions and indoor air pollution levels
- Its design is such that adequate oxygen is supplied in the cooking area continuously. This results in efficient combustion, which in turn results in: a) higher temperatures b) up to 80% less smoke.

Economic benefits

- Its fit with all types of biomass fuel makes the *chulha* an economical cooking solution
- No recurring or running costs
- Modular construction gives *chulha* a longer life
- Less indoor pollution means healthier families and less spending on medical care
- Entrepreneurs earn significant supplementary income making and selling *chulhas*

Health benefits

- Healthier indoor air quality benefits young children and women who spend maximum amount of time in and around the kitchen



A prototype of the new smokeless *chulha*

- Easy cleaning option reduces risk of injury

How else does this *chulha* score?

A rural household uses upto 3000 kgs of firewood per annum. Average cost of firewood is ₹ 2 per kg. Since the improved *chulha* uses 50% less firewood, a rural household using this *chulha* will save 1500 kg for firewood in a year. This translates into savings of ₹ 3,000 per annum or ₹ 250 per month. The monthly income of a representative rural household generally is ₹ 2000. A saving of ₹ 250 notionally increases the purchasing power of this family by 12.5%. This is very significant increase and will be reflected in raised living standards.

Also consider this: 1500 kg of firewood saved means saving of at least three full grown trees. If an entire village of say 200 firewood burning households adopts improved *chulha* then this village will be saving 600 trees per annum. This is equal to about 1.5 acres of forest area!

We, at the Sri Sri Institute of Agricultural Sciences & Technology Trust, Raipur centre, implemented a pilot project for Bhilai Steel Plant of Steel Authority of India under its Corporate Social Responsibility initiative. The project was implemented at Chhattisgarh where we installed these *chulhas*. The project was found to be successful by the Bhilai Steel Plant. They have in fact asked us to train a few BPL (Below Poverty Line) women who will make these *chulhas* for installation. The idea was to generate some income for BPL women.

We have observed that there is need of more efforts to make people aware about the smokeless *chulha*. People must be aware about the benefits of using smokeless *chulha* over traditional *chulha*. If people are healthy, the society will progress. ■

Dr. Ramkrishna Muley is Chairman, Sri Sri Institute of Agricultural Sciences & Technology Trust, Bangalore.

3Rs for a green future

Never have been the 3Rs – Reduce, Reuse and Recycle, been as critically significant as today. Living within planetary boundaries is the most promising strategy for ensuring a healthy future. Avani Jain talks about pollution control, green footprints, sustainability and the 3Rs which are necessary to help build a green future.

THE well-being of humanity, environment and functioning of the economy, ultimately depends upon the responsible management of the natural resources of the planet. However, these days, people are consuming far more natural resources than what the planet can sustainably provide. In fact, many of the Earth’s ecosystems are nearing critical tipping points of depletion or irreversible change, pushed by high population growth and economic development.

Further, issues like industrial expansion, extensive land use, etc., are leading to global warming, pollution and waste, which are both toxic and hazardous. So, it is needed for the industries and individuals to awaken and take care of their consumption of resources, save as much as they can and adopt the 3Rs – Reduce, Reuse and Recycle – to decrease pollution at all levels.

Decoding the 3Rs

Reduce: Creating more value with less

If we consume all natural resources, then our future will not be healthy. The environmental imbalances will seriously disturb the ecology, economy, ecosystems and life cycles. Thus, unplanned usage or consumption of natural resources like land, water, air, minerals, trees, energy sources etc., should be stopped if our future generations have to use the same planet, on which we live today.

All sectors like agriculture, power, land-use, and construction, industrial and technological, have to step in and make the right efforts. From turning the water taps off at home and offices to producing new paper, glass and metal products from recycled materials, 70 to 90 percent of the energy consumption and pollution can be reduced.

Reuse to lift off the burden

While reducing is necessary, reusing the resources is also

equally important. Scarce fresh water resources and rapidly deteriorating quality of water resources due to discharge of untreated or non-compliant treated effluents are compelling industries across the country to adopt effective technologies for treating wastewater for reuse.

With appropriate process

design and use of advanced technologies, wastewater can be reused for industrial process, non-potable domestic applications and indirect potable purposes.

Recycle and recover valuable resources

Recycling is the key for carbon footprint reduction and pollution control. Recycling reduces carbon emissions by reducing the need for raw materials, which generally require more energy to produce and transport. In the case of plastics, recycled plastics in end applications can displace virgin plastics and save an average of two tonne of carbon dioxide for every



tonne of plastics recycled. Further, recycling Polyethylene Terephthalate saves about 50 per cent of energy. Recycling also helps in reducing waste in landfill and the consequent methane emissions. Hence, many industries are going in for advanced recycling methods and technologies.

Here, recycling at source as a concept is also important to consider. In this method, recycling is done at the actual process and not at the end of the treatment. As a result, no additional waste is generated and the same effluent can be used instead of fresh reactants multiple times. The major advantage of the tool is that it reduces the effluent load to the water bodies.

Just like recycling of plastics is necessary, recycling of water is of utmost importance too. Water recycling is not just an option, but a must for all the industries as availability of potable water is becoming scarce for human consumption and agricultural purposes. Thus, industries are increasingly adopting practices like Zero Liquid Discharge (ZLD), which strives to employ the most advanced treatment technologies to recycle and reclaim virtually almost all the produced wastewater. The growing importance of ZLD is due to environmental constraints leading to water demand, hazardous effects such as global warming and ozone depletion.

Time to conserve and create

The United Nations estimates that the population of the planet will grow to 9.2 billion by 2050. Thus, the efficient and productive industry engaged in truly sustainable practices is essential to meet the incredible increase in demand for goods and resources that this growth implies.

Hence, it is the right time that the industries as well as the individuals should get together, and act. It is important for all to learn to adapt the 3Rs, which can help in achieving sustainability by reducing pollution to a large extent.

What you can do

It is not all left to the industries to take steps for reducing pollution. While their actions may lead to pollution, you are a culprit too. So, every individual has to do their bit to reduce pollution. We agree that recycling at home is not possible in most cases, but how about reducing and reusing water and plastics. Here are 10 simple steps by which you can do so:

- Choose glass/stainless steel containers instead of plastic

ones for storage, heating and cooking - In fact, one should avoid non-stick cookware also as the Teflon coating or other resins emit toxic perfluorochemicals when heated. Also, cling wraps/microwave safe plastic containers used especially while operating the microwave should be avoided.

- Give up bottled drinking water - One should make it a habit to carry their stainless steel or reusable water bottles with them, whenever they travel. Use bottled drinking water, only when there is no other option available. Further, buying convenience foods packaged in plastics should be avoided.

- Bring your own cloth bags when you head to buy grocery - Instead of the shopkeeper giving you a polyethylene bag to put together your purchase, bring your own cloth bag or paper bag.

- Use rechargeable batteries - Through this, you will not have to buy batteries (packaged in plastic) too often. Also, avoid all kinds of products that have a lot of packaging.

- Line dustbins with paper bags instead of plastic bags - Everyone gets a newspaper in their house which becomes waste after one has read it completely. So, instead of throwing it away the next day, just use it to line your dustbins.

- Use biodegradable or reusable sanitary napkins - They reduce your waste and use of plastic trash bags.

- Avoid personal cars - Cars use a lot of energy and cause pollution. So, you should walk or ride a bicycle to your office or take a bus, instead of driving your car.

- Start a compost bin - The compost will be good for the soil in your garden and will

also mean less garbage for landfill.

- Turn off lights - Save energy by turning off lights that you are not using.
- Save water- You can do so by turning off the faucet while you brush your teeth. ■

The United Nations estimates that the population of the planet will grow to 9.2 billion by 2050. Thus, the efficient and productive industry engaged in truly sustainable practices is essential to meet the incredible increase in demand for goods and resources that this growth implies.



The writer is a journalist, poetess and nature photographer, who enjoys writing for print and online magazines. She has written extensively on food, fashion, lifestyle, education, real estate, B2B, environment, wellness and health. A voracious reader (admirer of William Dalrymple, Sudha Murthy and Rabindra Nath Tagore) and story teller at heart, Avani travels religiously to explore long lost history and virgin nature to get her adrenaline rush.

The Mind is just a garbage bin

The mind is just society's garbage bin, says Sadhguru Jaggi Vasudev of the Isha Foundation. But if you could pick and choose from it what you want, then it doesn't matter how full or how filthy the bin is. The mind doesn't need to be controlled. On the contrary, you have to be liberated from the mind, he says.

WHAT you call as your mind is just an accumulation that you have gathered. Please see, your mind is just society's garbage bin. Everyone who passes your way will throw some garbage into your head and go. You really have no choice about from whom to receive and whom not to receive. If you say, "I don't like this person," you will receive much more from them.

You may have the discretion about what to empower and what not to empower, but you have no choice about what to receive and what not to receive. Whatever you are exposed to naturally gets into you – you cannot help it. And this in turn becomes the content of your thought. The very content of your thought has come to you from outside. The content of your thought is all determined by what kind of situations you have been exposed to in your life; it is not really yours.

So what you think may have some social consequence, but no life consequence. If you begin to see that your thought and emotion have no existential consequence, suddenly things will start changing about you. Right now, you are hugely identified with the way you think and feel; it is the biggest attachment. If someone talks about attachment, the first thing people say is, "Should I leave my wife? Should I leave my husband?" However dear someone is to you, if they constantly go against the way you think and feel, they will drop out of your life. So your biggest attachment is to the way you think and feel.

The mind versus the physical body

We are too enamoured with the little bit of intellect that we carry in this bone-box. Your thought process can function only because there is a bank of memory. But in terms of memory, do you remember how your great-great-grandfather looked? No. But his nose is sitting on

your face now, which means that your body remembers. The mind remembers only certain things. But the body carries the information of our forefathers and can even remember what happened here a million years ago. Of all the gadgets that you have known, the human body is the most sophisticated gadget on the planet. With such a large brain, still you cannot figure out what is happening in a single strand of DNA. That is how complex the operations are. So your mind's memory is very miniscule compared to your body's memory. Your thought process is just this memory, the same old nonsense, recycling itself. Thought

has become such a compulsive part of human society. A large part of humanity has mental diarrhea because the thought process is simply *on* all the time. If you see the patterns of what it is, if you see the stupidity of what it is, then slowly you will distance yourself and without your attention, it will collapse.

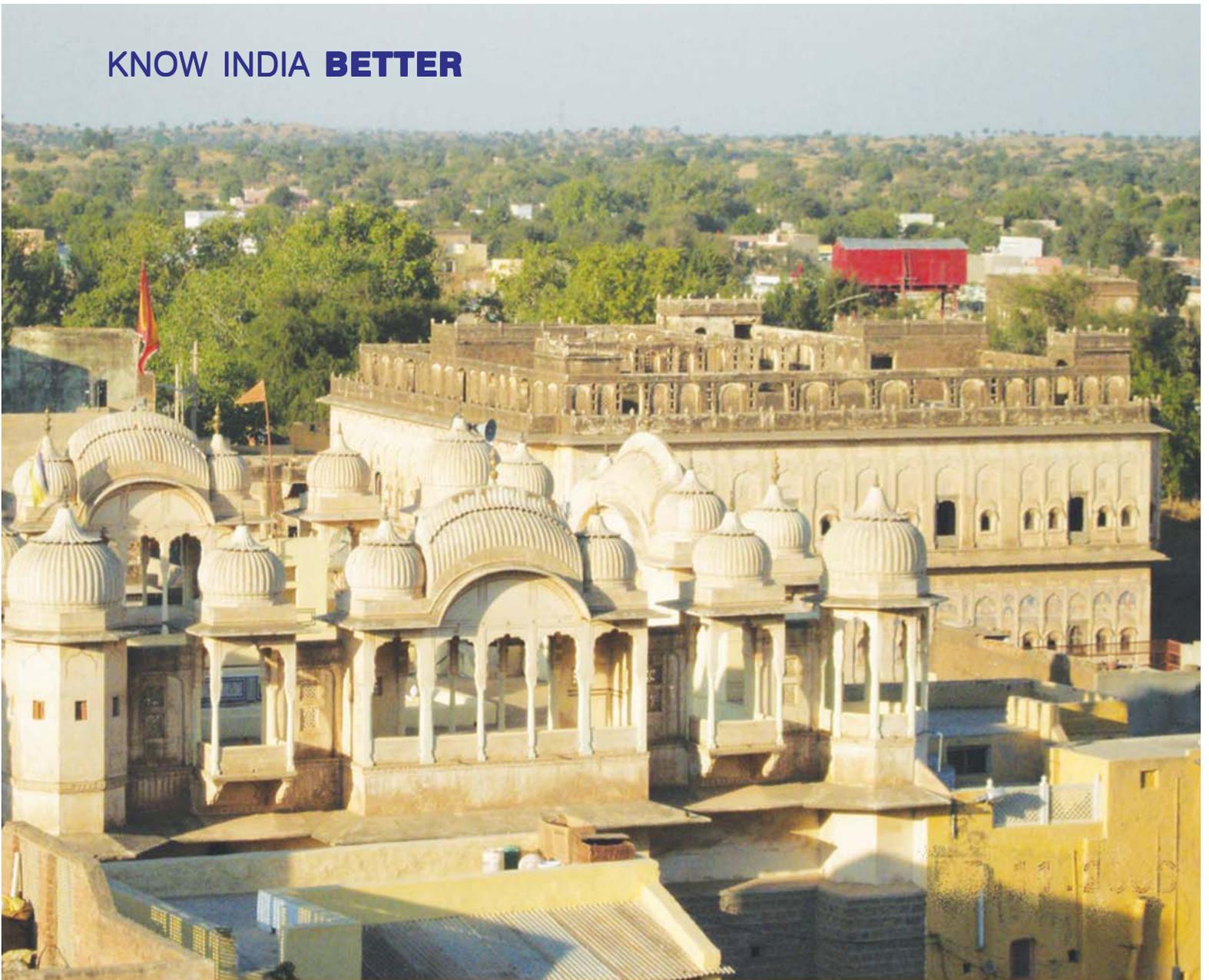
But right now, people in the world are trying to stabilise the mind with morality, ethics, belief systems and ideologies. Despite that, you will see the mind will do its own thing. For example, if you have observed someone who is super moralistic and correct with their life, is there a single crime on this planet that his mind has not committed? His hands might have been tied, but his mind has done everything. It does not matter how hard they try with their morals, fear of heaven and hell, and whatever else, still they are not able to stabilise their mind because that is not the way to do it. This effort to stabilise

the mind has not worked for thousands of years because people have not understood the fundamental nature of the mind. You do not know what the hell the mind is. You can make anything out of it because it has no character of its own. It is completely nebulous. It can shift from ugly to beautiful and from beautiful to ugly in a moment. You cannot control it, give it a form, or make it into a good mind. The

You can make anything out of it because it has no character of its own. It is completely nebulous. It can shift from ugly to beautiful and from beautiful to ugly in a moment. You cannot control it, give it a form, or make it into a good mind. The beauty of the mind is that it is formless.

(Continued on page 39)

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SHEKHAWATI

a desert bloom

How did an arid, remote part of Rajasthan become renowned for beautiful murals and enchanting havelis? How did the dry desert landscape inspire such splashes of vivid colours and inspiring art? As one journeys through the Shekhawati region of Rajasthan, one realises that human ingenuity can truly transcend shackles of the physical environment. All it needs to soar high are imagination and true creativity.

Text and photos: Katie Dubey



Sunset in the desert

WE were holidaying in Jaipur, when our friend sprang a surprise on us. “Anniversary gift for you two”, he announced, “I have booked you into Castle Mandawa tomorrow”. My husband’s jaw dropped, I burst into giggles, and our friend grinned like a Cheshire cat!

Next morning, while the sky remained colourless, the wind tossed sand on to the road and the pink city slumbered, we embarked on our 190 km drive to Mandawa, in the heart of the Shekhawati region of Rajasthan.

The Thar

Sand and sky is all there is. The Thar, generally called the



The desert ship, a camel in silhouette as the evening shadows lengthen

Great Indian Desert, is the 17th largest desert and the 9th largest sub tropical desert region of the world. Indigenous vegetation occurs in small clumps. Some *babul* trees, yellowing scanty grasses and desert weeds, defy the wind and sand and cling to life.

Crushing and cruel climatic conditions prevail. Temperatures dip below zero degree Celcius in winter and rocket over 50 degrees Celcius in summer, bringing waves of scorching hot air called the ‘loo’. The ‘loo’ smothers desert inhabitants. Scant rainfall affords only some relief to the land, and life goes on. About 23 species of lizards and 25 species of snakes thrive, several of them endemic to the area. Wildlife species, disappearing in other parts of India, survive here in large numbers, like the blackbuck.

The importance of the Shekhawati region

Shekhawati is a convenient term to describe three modern districts of Rajasthan that cover an area of about 30,500 sq km; surrounded by Jangladesh, Haryana, Mewar, Dhundhar, Ajmer and Marwar. Fertile and well watered on the eastern fringes, westward the land becomes a desert of rolling, drifting sand dunes interspersed with low grade millet fields, and sparse grazing for sheep and goats. The jagged chain of the Aravalli Hills lying east of the region, and rising to 3,000 ft, block precipitation to the west.

Shekhawati formed the physical border between two desert kingdoms, Jaipur and Bikaner. In the 18th century, this region also drew a timeline between two empires; a rapidly declining Mughal empire, and a speedily rising British Empire. The



A painted panel in Shekhawati showing Radha and Lord Krishna in dalliance, while Hanuman massages Lord Krishna's feet

interregnum saw the first mural paintings adorn the walls in Shekhawati.

Mural art – the pride of Shekhawati

Through the machinations of history, an impoverished corner of an arid region in the desert came to hold the most highly embellished structures with the largest concentration of mural art the world has ever seen. Not only are the outer walls of every home covered in murals, but also the inner ones, along with every structure; monuments, mansions, temples and step-wells.

The seeds for these paintings were sown in the ateliers of the Mughal court of Emperor Akbar. He induced artisans and painters from Persia to settle in India: First in Agra, and then in Fatehpur Sikri, where he had moved his capital for a short while. Here, the new school of mural paintings emerged. The Mughals prepared the soil for mural paintings, but prevented the seeds from germinating. It supported only the local Muslim *nawabs*, who were too terrified by religious taboos to indulging in artistic adornment. Art was thus left to the Emperor alone.

Two Hindu nobles held the territories surrounding those of the *nawabs*. These were later destined to become an outstanding “outdoor art gallery”. A century passed. The Mughal Empire was wilting. Beleaguered and threatened by the British, it faced pressing issues. The fate of a group of minor Muslim *nawabs* on the outskirts of their kingdom, surrounded by Hindu-ruled territories, amongst whom were the Shekhawat Rajputs, who held all of lands east of the Aravalli Hills, was not of

much interest to the Mughals at this juncture.

A Rajput revival of militancy occurred during the reign of the last Mughal emperor, Aurangzeb. They encroached through the hills and expanded their territorial holdings displacing the Muslim *nawabs*. Shekhawat’s expansion accelerated, until, in 1732, the conquest was complete. The Nawabs of Fatehpur and Jhunjhunu were vanquished and two Shekhawat Rajputs, Shardul Singh and his cousin Shiv Singh were installed on the conquered land.

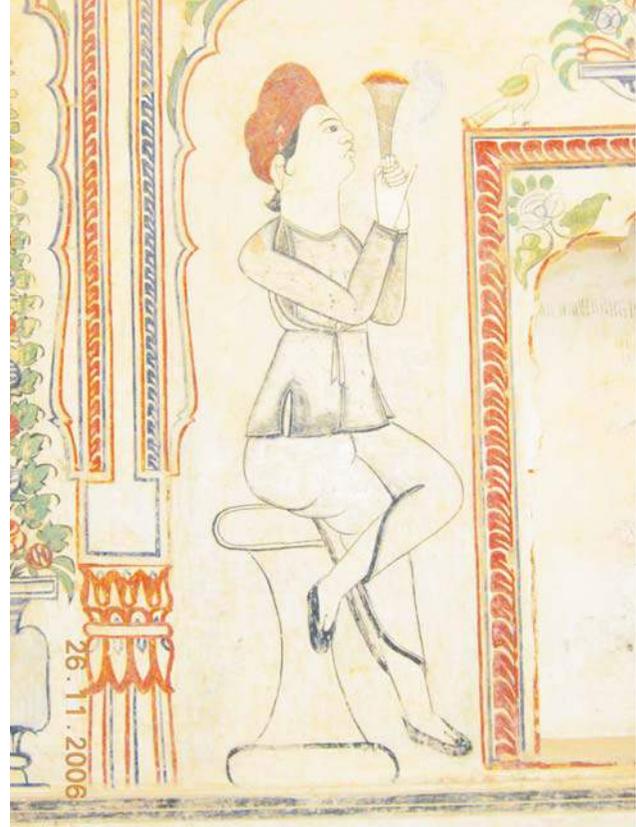
On their desert estates, the nobles had only two sources of income. They taxed farmers on their generally pathetic harvests, and imposed duties on the merchandise crossing their borders.



A carved wooden doorway, set in a painted archway of a haveli. The use of indigo is pre-dominant in this archway



A figurative painting of Lord Krishna as a rustic gowla or cowherd. Although the lines have faded, the colours are bright



A panel showing a man, probably landed gentry, smoking a pipe. The stool that he is seated on, and the pipe exhibit British influence

Camel-borne goods were the only form of trade in the desert and a major part of the economy. A small merchant community oversaw the local commerce.

In an era of strife, which the 18th century was, each prince found it difficult to fill his coffers. The Rajas of Bikaner and Jaipur tried every means to raise funds. Along with other rulers they raised tariffs on trade. Totally, their kingdoms spanned the whole of north Rajasthan, except for the narrow corridor belonging to the Shekhawats, who though vassals, remained independent and set their own rates. This meant that a caravan crossing through Shekhawati may have to pay several times, but, the rate was still lower than that levied by Jaipur and Bikaner. So, merchants preferred the circuitous route.

From the turn of the century until 1822, a vast amount of trade passed through Shekhawati and Marwari businessmen were attracted to the region. These men and their descendants were later to finance the majority of murals characteristic of Shekhawati, their prosperity enhanced by the deflection of trade. Some of the money they earned

went towards building temples, memorials and mansions.

But, the days of flourishing cross-desert trade were numbered. If it had merely been disrupted by growing banditry, then its repression by the Shekhawati Brigade during the 1830's would have brought relief. But, no such thing happened.

The British profoundly affected the traditional pattern of trade.

The ports of Calcutta and Bombay handling large European vessels

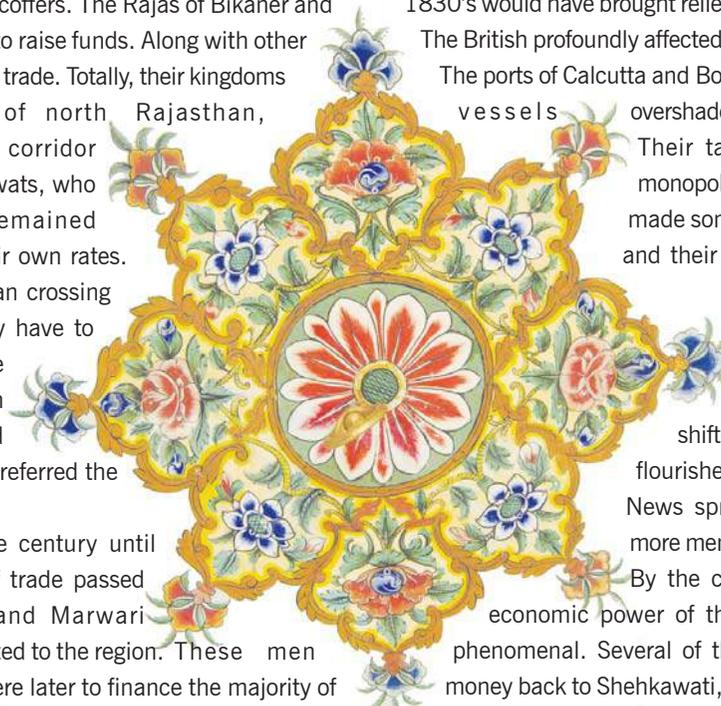
overshadowed the small ports of Gujarat. Their tariffs, designed to establish monopolies for the East India Company, made some established routes unviable and their pressure on the Jaipur Court

for reduction of duties rang the death knell for the Shekhawati trade route.

Unfazed, the Marwaris shifted their businesses to Calcutta, flourished and amassed huge fortunes. News spread to Shekhawati, bringing more men from desert towns to Calcutta.

By the close of the 19th century, the economic power of the Marwaris in Calcutta was phenomenal. Several of the migrants began ploughing money back to Shekhawati, into their ancestral properties.

From that time on, they completely eclipsed the Rajputs in power and pomp.



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A room in the Mandawa Castle. Keeping its old world charm intact, its only modern touch are the fans and the modernised bathroom

In the 18th and 19th centuries, Marwari merchants constructed grand havelis in the Shekhawati region. Steeped in wealth and affluence, these merchants got busy outdoing each other in building grand edifices. They financed painting and architecture in Shekhawati, maintaining their status in their hometown. As the century progressed, mansion or memorial, temple or well, every building was covered with paintings. When famine struck Shekhawati, they poured in more money. Their relief projects took the form of yet more palatial buildings embellished with yet more paintings. Each

building was an expression not merely of affluence, but also of confidence in a new era of stable government.

Initially, the pictures were limited to panels between the stone brackets which supported the projection of an upper story over the lower façade. Soon they spread to any surface worthy of becoming a canvas. Outer walls, inner courtyards, sitting rooms, bedrooms – all received the painters' attention. Up to the early 19th century, the themes were largely religious. Later, historic events, personages, battle scenes, and folk heroes or whatever caught the artist's fancy, was also painted in great



A wall mural of two nobles engaged in a camel race in the desert



A painted panel showing Gopinathji being worshipped by the rulers



Commorative *chatris*: These small monuments are memorials to the dead and can be seen from time to time in isolated spots set back from the road

detail. Later, cars, trains, airplanes, ships, telephones, foreigners in hats, suits and gowns began to appear on the walls along with scenes from Lord Krishna's life. The paintings acquired historical value portraying the changing times.

Extravagant buildings sprang up in the 1830's and continued

into the early years of the 1900s, transforming a large part of Shekhawati into a "desert gallery". Fine architecture was not unknown to the region. The Shekhawat Rajputs had built and so had the Kaimkhani *nawabs* before them. Much earlier, in the 10th century, under the Chauhan Rajput rule, the beautifully carved temple of Harshnath had been constructed on a hill-top near Sikar. Handsome buildings were not new, but the sheer burst of output in terms of quantity and quality in Shekhawati surpassed anything done earlier.

Given the nature of Shekhawati, building materials could not be transported over any great distance easily. There were few stretches of road, and even these were rendered un-useable when covered with shifting sand. Camels or bullocks were used for transport. No first class stone was quarried nearby. The fine red sandstone quarried to the west of Churu, was too far to be of use during the building boom. The carved stone elements – brackets, pillars and decorative panels – seen in local buildings, were all quarried at the foot of the Aravalli Hills, particularly at Raghunathgarh. For the walls, three materials were used, depending on their availability - brick, stone fragments and a hardpan material, *dhandhala*.

Away from the hills, brick was used. Closer to them, in towns like Jhunjhunu, Khetri, Singhana and Udaipur, stone

The origin of Shekhawati



The havelis of Shekhawati are very famous

his *guru* granted him a boon. He asked for a son.

Mokul was asked to return to his principality and graze cows in a designated area and worship Gopinathji, Lord Krishna, as lord of the *gopis*. Having done this, a son was born to Mokul Singh whom he named Shekha. When only 12 years of age, Shekha inherited his father's estates. During the 15th century, he conquered and held a considerable amount of territory in this region of Rajasthan and the lands he conquered came to be called 'Shekhawati'. Gopinathji is the region's reigning deity. ●

LEGENDS thrive in India, particularly in small towns. One legend talks of Shekhawati being under the sea in pre-historic times. According to geologists, the presence of fossil forms found in the stone formations here are sufficient evidence to prove the theory. What remains a mystery is what caused the sea to recede, leaving arid land in its wake. The region also finds a mention in texts as ancient as the Rigveda, Manusmriti and the Ramayana. It was then the Matsya kingdom, and extended up to the Saraswati River, not limited to the two present day districts.

The more cognisable story is that of Mokul Singh, the ruler of Barwada in the 15th century. Lacking an heir, he retired to Vrindavan, the land of Lord Krishna, to live in austerity. Pleased with his devotion,

The road to Mandawa

THE road was velvety; a narrow bitumen strip that cut through a landscape as flat and yellow as a pancake for the most part, relieved by rare patches of dirty green, where hardy xerophytic herbs had taken root and a strange creeper with fruit like small melons, crept stealthily along the sand in patches. On enquiring with the driver, I was told that camels ate this strange fruit.



As small as a tennis ball, this desert fruit of a sandy creeper, is consumed by camels and fauna that feed on thorny vegetation

The landscape hardly varied and as we neared Mandawa, got even more stark, if possible. By mid-morning, even though it was winter, the sun was burning an already scorched landscape. Protected by the air conditioning in the car we journeyed on, but at 1.30 pm, when pangs of hunger hit, it was hard to find a spot where one could halt awhile to eat the packed lunch. Driving down the treeless road, we finally did come to a spot where a large *Prosopis juliflora* bush cast a short shadow across the road. Under this welcome shade we finally halted for lunch. *Prosopis juliflora* was introduced in the desert to halt its march, but ironically, it is overtaking the desert itself! Lunch over, we moved on and around 3.30 p.m., entered through a maze of narrow streets, the castle town of Mandawa, centrally located in the Shekhawati region.

Our entry into Mandawa was uneventful. For a town of historical importance, it was sadly sleepy, fairly dirty and unkempt. Unimpressive in fact, with narrow winding streets between large mansions that were going to seed. The first haveli (mansion) that we came upon as we entered and which was in good shape, was the Goenka Haveli. The Goenkas remain a prosperous business group to date, and are well known to the public at large on account of the Indian Express, a well received newspaper throughout the country. Their haveli is prominently located along the road and well maintained. From this point on,

wherever we turned, we encountered painted walls. Weaving in and out of narrow streets, checking with locals at every turn, we finally entered a slim alley that brought us before the massive gates of Mandawa Castle. As those gates were pulled open by a couple of liveried guards, literally in the blink of an eye, we were transported to another world and transformed to royalty.

The gates swung close, as our vehicle pulled up by the portico. The car doors were held open for us deferentially by more liveried personnel and as I stepped out of the car, indeed, I was a princess.

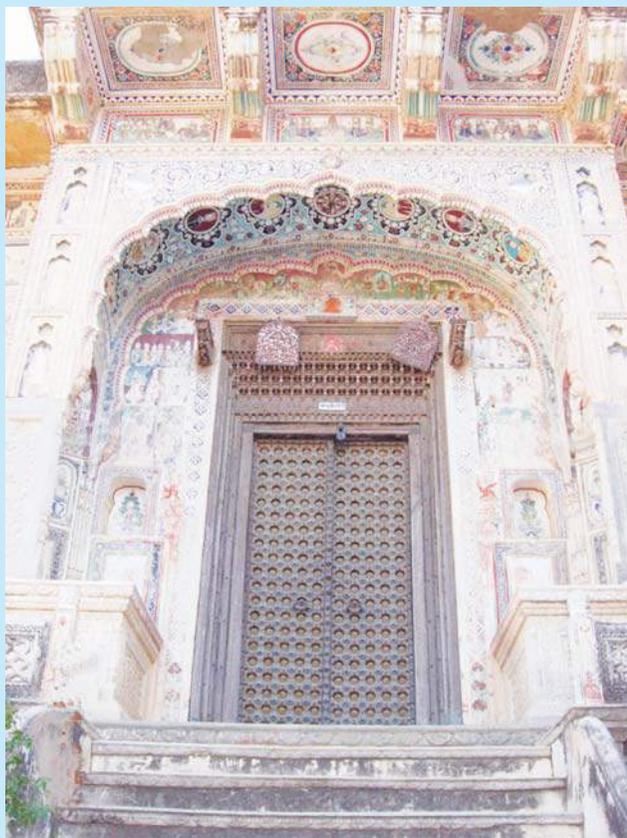
I found myself in what was once the durbar hall. It was so highly ornate that I felt distinctly uncomfortable taking a seat there, while check-in formalities were being completed. Two throne chairs occupied a central position. They were flanked by carved camphor chests and topped by enameled lamps. A large crystal chandelier hung from the ceiling and the walls were crammed with paintings and antiques while the arches were painted from end to end. The overall effect of this blend of eastern and western opulence was rather overwhelming. Even the low arch carried portraits that were obviously restored, and the work was in gold leaf, no less! I am told that no two rooms are the same here! How could they be in this maze, where rooms are tucked away at various angles? They have been remodeled to suit the modern tourist, but with its old world charm left untouched.

Formalities complete, we were shown to our room on the first floor via an extremely narrow stairway. As the staircase came to an end we had to double up under a really low arch that opened on to a terrace. Rooms fronted the terrace. The bellboy brought forth a bunch of huge



The Durbar hall of Castle Mandawa, now being used as a visitor's lounge in the hotel section of the castle. Much of the painting has been restored and the seating apart from the throne chairs, are modern

ra – a travelogue



The covered entrance of the Chokhani haveli with ornate arch and overhang, above the intricately carved doorway

keys and fitted one to the padlock of room 208. Then he flung open the wooden doors with a flourish and bowed us in. I don't recall now if my jaw dropped at what was before me; a good sized room in which a carved four poster bed dominated. An enclosed verandah ran the length of the room along which was a narrow divan covered with woven silk and strewn with cushions of several sizes. Above the divan was a row of skylights of coloured glass that set the room aflame with varied hues. Granite pillars supported the low arches that were figure painted and framed with flowers. A coffee table, refrigerator and a few other pieces of furniture were inconspicuously, but elegantly placed in the room. A passing thought – I wondered how such massive pieces of furniture were hauled into the room given the narrow access? But there was much more to occupy my mind.

We gathered our cameras and were soon bending through the connecting arch and moving up to the battlements of the castle. Erected on a hillock, the castle dominates the town below as it is meant to. From the battlements we garnered a bird's eye view of the town sprawling below. We clicked away!

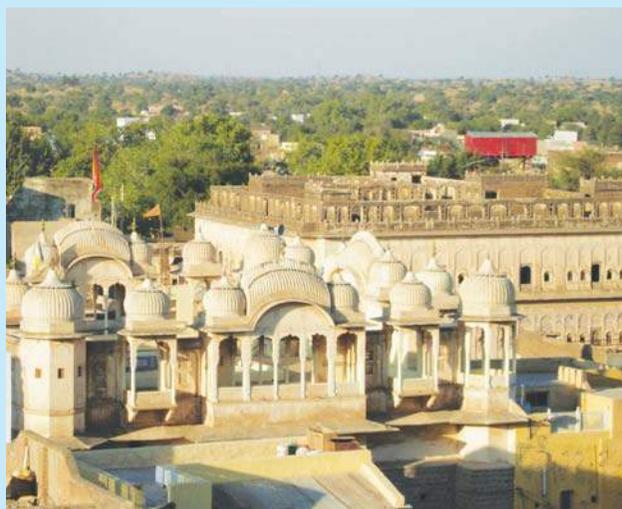
We returned to the castle as dusk was setting in. A messenger came to the door to inform us that dinner would be served on the spreading, manicured lawns; His Highness Bhim Singhji, current owner of the castle would

dine with his guests. Dressed in our limited finery, we entered the dining area. Attentive waiters materialised, wine flowed into crystal glasses, the firelight glancing off them. There was romance in the air. We clinked glasses, sank back into the deep armchairs happily and sipped the excellent Chablis. Completely relaxed, we began to enjoy the bracing cold without and felt a warm glow within.

Warmth from the braziers placed around the lawns began to counter the chill in the air. The embers glowed fluorescent red and gold, and the stars looked down from a clear indigo sky. Magic floated around making an everyday routine sublime. Guests began to fill the lawns and soon after, a troupe of rustic musicians came into sight, led by an old man, with well oiled and curled handle bar mustachios. He carried two flares and was followed by musicians carrying a *dholak*, cymbals and other instruments. He sang a folk song in the local lingo moving from table to table, while the musicians followed, accompanying him with a lilting tune. We looked on enthralled and forgot to eat for a while, completely immersed in the music. The veil of a time bygone lifted for a while and led us into the embrace of a gracious past.

Regality prevailed over every aspect of the evening from the heart-warming hospitality to the regal buffet spread. We ate at a leisurely pace and watched the stars hang low in the sky. Guests began to leave, but we lingered, and as the lawns emptied we savoured the privacy accorded to us. We strung each moment, a precious pearl in the string of memories, sitting in companionable silence. The staff waited unobtrusive and uncomplaining in the periphery of the lawn.....

And for a day and a night, we were 'royalty'. ●



Mandawa Castle: Seen from the battlement of the castle are the living quarters of the current owner Shri Bhim Singhji. Beyond lies the town of Mandawa



Painted arch in the Durbar hall of the Castle Mandawa bearing portraits of ancestors of the royal family and embellished with *torans*

fragments. In the central areas, *dhandhala* which were grayish lumps of hardpan. Many of the best painted towns are in the *dhandhala* belt.

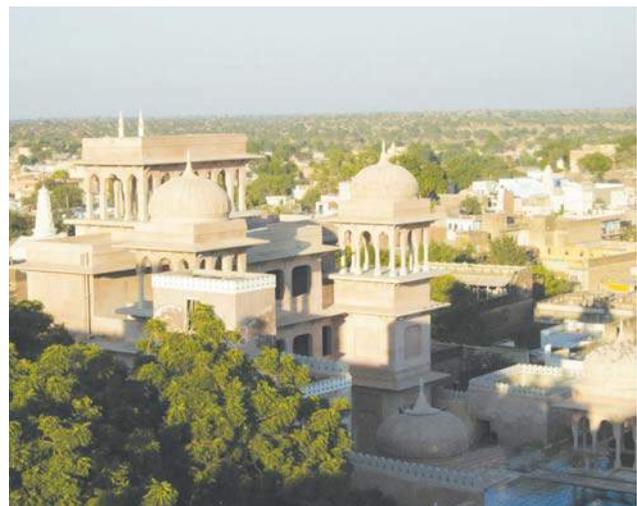
Timber, rare in the desert, has only one source – the ‘rohaira’ tree large enough to provide timber for fine woodwork in forts and havelis.

The fort and havelis of Mandawa

As always, the town came to be known by the name of its originator – Mandu. Mandu Jat, established a *dhani* – a hamlet, and dug a well here in 1740 AD. The village was known as ‘Mandu *ki dhani*’. Gradually, it evolved into ‘Mandawa’.

Located in the centre of the Shekhawati region, it grew into a trading outpost for the trading caravan routes that traversed the desert from China, Middle East and parts of India. In 1756, Thakur Nawal Singh, who ruled Navalgarh and Mandawa, built a fort here to protect this lucrative post. With protection comes security and in no time at all, more traders came to Mandawa and settled here. A township evolved. But, the Thakur’s family did not inhabit the fort until the very end of the 18th century, when Naval Singh’s grandsons, Padam Singh

and Gyan Singh came over to Mandawa from Navalgarh. Originally a walled city, today little remains of its defences, but in 1828, when the combined forces of Jaipur and Sirkar attacked the fort, it successfully withstood the siege for an entire week.



Mandawa Castle: Multiple levels are visible with a swimming pool below. *Chatris* and terraces of traditional Rajasthani architecture are prominent on the higher levels



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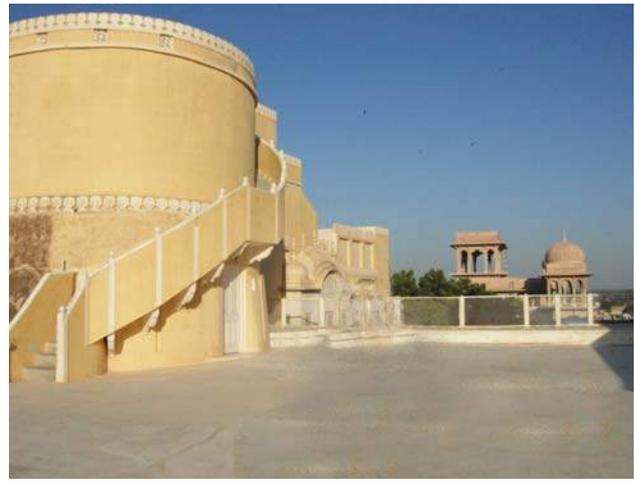
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An evening on the lawns of Castle Mandawa. A troupe of local musicians entertain the guests as they move around the lawns



Turrets were brought in by the British and adopted by the Indian princes and kings in their fortifications

The fort is the mainstay of the town and built in the medieval style. It has a painted arched gateway, adorned with images of Lord Krishna and his cows over a single gate.

Forts were built by the Thakurs on their *Thikanas* - 'fiefdoms' - to safe guard their holdings in a violence prone era. The fort was always established on the highest elevation available so as to give the lookout a clear view of anyone approaching it. They were all functionally built on a square plan with a thick wall and sometimes a moat surrounding it.

The focal point of Mandawa, the castle, is built in mixed architectural styles that blends Rajput canopied terraces with Chinese pagodas and British turrets, using both *dhandhala* and stone visible in the turrets and arches.

Rivaling the castle in opulence are the havelis. The haveli was to the *Bania* what the fort was to the Rajput – his home, his status, his headquarters and his defense from the outside world. Most of the havelis are sprawling mansions with four courtyards covered in murals and frescoes within and without; paintings of Lord Krishna, Shivji, Ganeshji and other gods of the Hindu pantheon are interspersed with family portraits and lesser subjects like dancing women, *hooka* smoking men, and

the more contemporary English men and women, cars, trams and airplanes.

The Gulab Ladia Haveli, one of the most palatial mansions of Mandawa is quite exceptional in its presentation of mural art. Gold leaf adorns most of the clothing of Lord Krishna on the walls. Latticed windows and carved wooden gates are evidence of the skilled workforce of the times. The Jhunjhunwala Haveli built in 1859 is no less outstanding a monument to traditional Rajasthani art. The epitome of the grandiose, the Goenka Double Haveli, is unique with its twin grand entrances; their outer facades featuring camels and horses among other subjects. The Poddars, Lohias, Ladhias, Chokhanis and other business tycoons, whose lines continue to this day, can trace their ancestry to the towns of Shekhawati to which their forefathers were drawn 300 years ago. ■



The writer is the author of three coffee-table books and writes for various newspapers and magazines on nature and environment.

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“It never was, and I do not think it ever will be a financially viable profession for anyone involved in theatre in India”



Neeta Mohindra is a multi-faceted person gifted in two different forms of art – fine arts and theatre. Her involvement with painting is research and academic oriented. Her work in theatre is performance and experiment oriented. Backed with a Ph.D. in ‘Tribal Arts of Southern Rajasthan’, Neeta has been teaching fine arts for over two decades and has exhibited her work in around twenty solo and several group exhibitions across the country and abroad. But theatre remains her belief, her love and her passion. Recently in Kolkata to perform her latest play *Chanda Mama Door Ke* directed by M.K. Raina under the banner of ‘Rangtoli’, Neeta’s own theatre group, this widely-travelled and amply awarded Sangeet Natak Akademi awardee opened out in a free-flowing, one-to-one interview with **Shoma A. Chatterji**.

What intrigues me is that, basically being a painter, an artist and an art teacher, what triggered this passion for theatre in you?

I started doing professional theatre before I graduated from college, though my family was not comfortable with the idea of my taking up theatre as a career. They allowed me to do theatre along with regular studies on the condition that my grades in academics do not go down. My career in theatre began in 1978 and to everyone’s pleasant surprise, my grades improved when I took on theatre seriously. Painting began in real seriousness much later with my first exhibition in 1984.

It is really difficult for a woman, specially a Punjabi woman to venture into theatre because of the tremendous demands it makes on time and space and takes you away from the conventional roles of wife and mother - so how did you cope with this contradiction?

It may sound clichéd, but it would not be an exaggeration to say that I have ‘lived’ theatre from the minute I took it up. I have remained single and I am so devoted to my passion and committed to painting, that there were times when I forgot the basic needs of food and sleep and this took a heavy toll on my health. In 1994, I was teaching art in the mornings, directing and rehearsing for *Jisne Lahore Nahin Dekha* in the



evenings, and painting for my exhibition at night. But I loved doing all this because I am a workaholic. Finally, it was my ailing mother who came to live with me, who forced me to take breaks between work schedules to take care of her. Yes, it has been tough being a woman and that too, a Punjabi woman taking to theatre. I used to get solid roles but in the beginning, it was more for my looks than for my acting. But it paid in the end.

Is theatre a viable profession today than it was earlier? In other words, can theatre be a full time occupation today in India?

The answer is no, no and no. It never was, and I do not think it ever will be a financially viable profession for anyone involved in theatre in India. Of course, the scenario differs for those who are well connected and can manage grants regularly, but not for all of us. We are fully aware that theatre is surviving because of the people who work elsewhere for bread and butter and do theatre because they love it and are passionate about it.

Which play among your entire repertoire would you choose as your personal favourites and why?

Topping the list is *Buhe Barian* which was my solo performance in Punjabi. It was scripted from four short stories of four famous Punjabi writers Amrita Pritam, Ajit Kaur, Kartar Singh Duggal and Veena Verma. The stories presented microcosms of women from different strata in society. It was a challenging task and I grew as an actress along with this play. It opened in 2003 and is still extremely popular among the audience. Over a hundred shows, I learnt more about the characters I was portraying and this impacted on my presentation every time. It is still tough to do this play because of the demands it makes on



Neeta Mohindra, depicted in a painting.

your body, energy and speech, and these are also the reasons why I find it so fulfilling.

Tell us something about your recent production *Chanda Mama Door Ke*.

It is a dialogue between a mother and her unborn child. A modern, educated and liberal woman, the protagonist of the play raises question about the rights of an unborn child. She starts talking to the child the day she conceives and continues to do so, treating her unborn child as an intelligent, equal, individual being who can both comprehend as well as respond to the range of social, political issues that are being discussed with it. As the play progresses so does the dialogue, gradually moving beyond the mother-child paradigm onto a new level of human understanding and communication. The child chooses not to be born in a world filled with strife, conflict, death and disaster. Since this is also a one-woman performance, I am both mother and child and other characters, and this is the challenge I meet each time I perform.

What about other memorable plays over the years you would like to mention?

I loved *Mother Courage* directed by M. K. Raina in which I played the mother.

The role of Mallika in *Ashadh Ka Ek Din* is every actress's dream role and it has been no different for me. After I founded my own theatre group Rangtoli, the first play we performed remains one of my favourites. It was called *Abhisarika*. I directed this play besides acting in it and during the rehearsals, M.K. Raina spotted me and cast me in a telefilm based on Bertolt Brecht's *Caucasian Chalk Circle*.

I would like you to mention the names of leading women in Indian theatre whose work has truly impressed you and who you think have taken the movement towards socially relevant theatre forward and why?

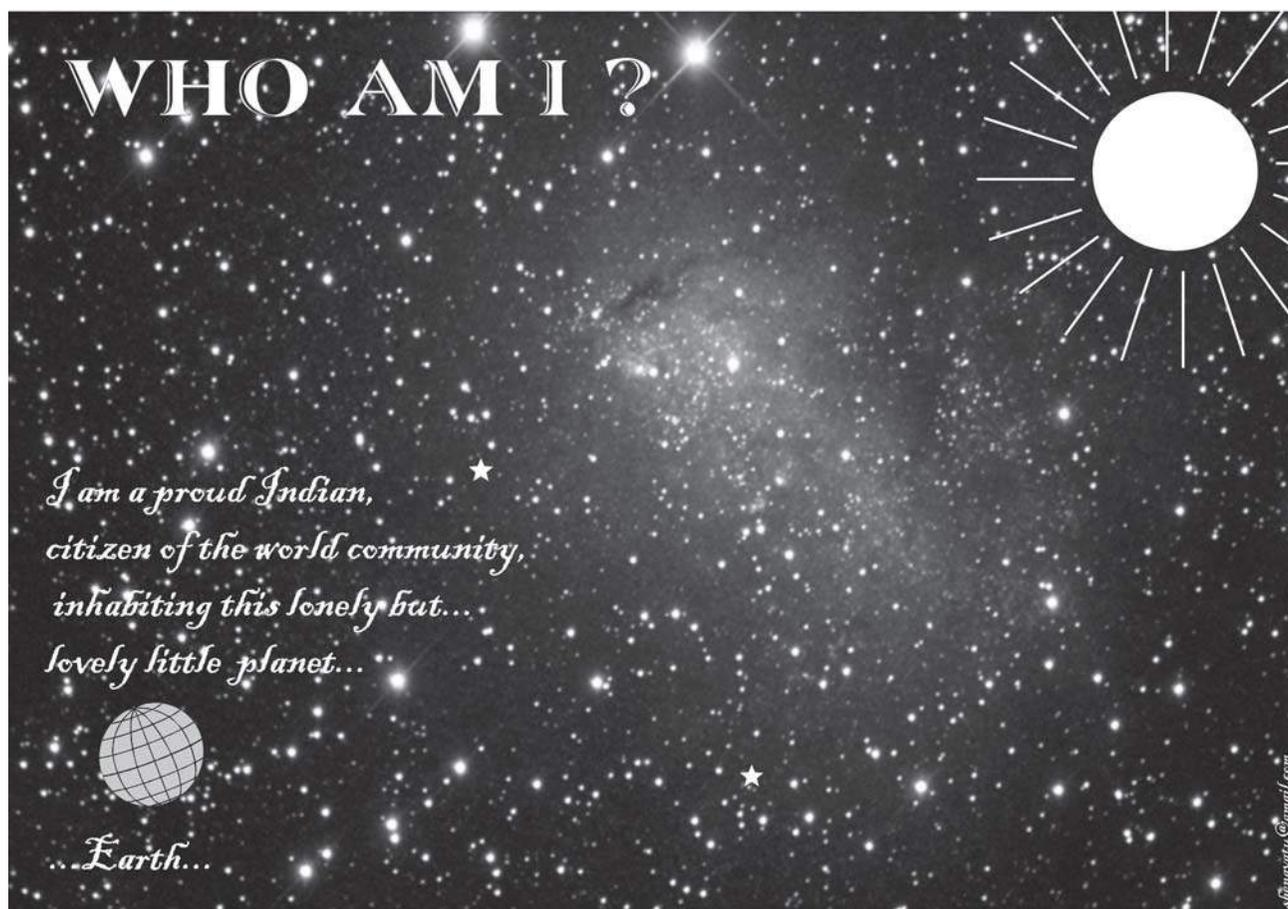
Many women are doing very good work consistently. Among them are Neelam Mansingh Chaudhary in Chandigarh, Maya Rao is doing a very different kind of work, Usha Ganguly is running a big group in Kolkata and then there are Anuradha Kapoor, Kirti Jain, Amal Allana and so on. But on a personal note, I must confess that I do not idealise any of them. I choose to be my own person.

Let us hear about your group Rangtoli.

Rangtoli was founded with the aim of promoting the taste and flavour of theatre in a city like Chandigarh that has reveled more in culinary delights than in theatre. I think, with our plays under the Rangtoli banner, we have been able to make a dent in the mindsets of the people of this city. We have staged productions like Gargi's *Abhisarika*, Ibsen's *Doll's House*, Ajay Shukla's *Doosra Adhyay*, Safdar Hashmi's *Aurat*, Gurcharan Das's *Larens Saheb* and *Nine Jakhoo Hill*, Ariel Dorfman's *Death and the Maiden*, Rani's *Cleopatra* and *Buhe Barian*. *Chanda Mama Door Ke* is our latest production.

What is the basic difference between professional theatre, group theatre and individual performances?

Theatre is a group activity. Even a solo act is a team effort because the solo actor needs a basic script to work from, a group comprised of a costume designer, an art director, a music director, musicians, light men, sound people and so on, so there is nothing like individual performance in theatre. Professional theatre is basically one that is self-reliant. For instance, it has its own performing space, space for rehearsals, money to pay the cast and crew, guaranteed audience and so on. Fortunately, theatre friendly audience is on the rise in the country and therefore, one hopes professional theatre keeps going. The term 'group' theatre is generally applied to a group that is committed to a particular kind of performance within theatre or has a social agenda or both. Proscenium is not the last work for group theatre people and they are trained and prepared to perform anywhere – on proscenium stage, in the open, in gardens, fields, schools, *chaurahas* and so on. They are loosely structured because they are not economically viable. ■



New OIOP Clubs in Mumbai

St. Joseph's High School, Kandivali (W), Mumbai



Ms. Anuradha Dhareshwar, Editor, OIOP, Mrs. Sucharita R. Hegde, Trustee and Managing Editor, OIOP, and Principal Rev. Sister Dollyrose D'Souza lit the lamp

Mrs. Hegde presented the OIOP Club membership certificate to the Principal

Students with Mrs. Hegde, Ms. Dhareshwar and college staff

P.J. Pancholia High School, Kandivali (W), Mumbai



Mrs. Sucharita R. Hegde presented the OIOP Club membership certificate to the Principal Mr. Vasant Kumar

A section of the student audience

Mrs. Hegde fielded questions from the students

National Kannada Education Society's Junior College, Wadala, Mumbai



Mrs. Sucharita R. Hegde, Principal Mrs. Sarojini Rao and Ms. Dhareshwar inaugurated the event by lighting the lamp

Mrs. Hegde, Mrs. Rao and Co-ordinator Mr. R. Kuckian unveiled the OIOP club banner

Students pray on the occasion

The Mind is just a garbage bin

(Continued from page 22)

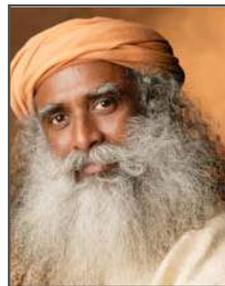
beauty of the mind is that it is formless. The problem is that you have lost the choice. Your association with the mind right now is such that there is no distinction between what is yours and what is you. The reason for all this trouble is that you have gotten enmeshed in it. If there was a little distance between you and the mind, your mind would be like a shopping mall.

If you go into a mall, you do not pick up everything there and come home – although a whole lot of people are picking up enough to make their house look like a mall! Whether you want to live in a house or a warehouse, you must decide. A house means you have things that you need, but a warehouse means you have everything. Similarly, everything that you have perceived through the five sense organs is stored there in the mind. In fact, the more there is the better, because there is no such thing as a pure mind. It is a garbage bin. A pure garbage bin is no good because a garbage bin must be rich with all kinds of things. The only thing is, you must have the freedom to pick what you want. If it has gotten all over you, then it is trouble.

Once you are not identified or submerged in it, the content of the mind is not a problem. It is just what society has offered me in my life. All the rubbish that has happened around me is there in my mind, but once I have the choice of what to pick and what not to pick, the content of the mind is not my concern. I want the whole universe to be in it. I want the most fabulous things and the filthiest things

to be in it, but I have the freedom to pick what I want. This is why in yoga, we do not attach any importance to the content of the mind. We only attach significance to the mechanism of the mind, how it functions. Whatever stuff you have in it, if you learn to work it properly, then the quality of life changes.

Now, because people have not achieved the freedom to choose, they are trying to curtail the possibilities of the mind which have turned into such a big problem. The mind need not be controlled – you have to be liberated from the mind. Once that happens, it travels with you, but you are not in it. You can put your hand in it when you want, otherwise your hand is out of it. If your hand is out of it, then you can sit here as pure perception. Your perception is distorted only because the content of the mind is constantly interfering. If you look at a person your memory will say, “Oh, he’s like this, he’s like that.” If you can leave it aside and simply look, your perception will be absolutely perfect. You will not imagine anything good or bad; you will just see what is there.■



Sadhguru is a yogi, a mystic and a visionary, and a prominent spiritual leader. An author, poet, and internationally-renowned speaker, Sadhguru’s wit and piercing logic provoke and widen our perception of life. More of his sayings can be accessed at: isha.sadhguru.org

When watchdogs are tame

(Continued from page 9)

Where is the budget for training and awareness?

We do not see the Board budgeting for any training or research. The parent Environment Ministry provides a miniscule budget, if at all, on training and almost nil on research. So when there is a real-time problem, especially with semi-government bodies, e.g. municipalities, I have seen spurious agencies offering huge schemes, making tall claims, requiring and getting huge financial support, and finally reporting half-success or failure. Secondly, the PCBs do not involve citizens in their programme of inspections. In fact, any citizen-oriented programme, if ever taken up by the Boards or the Ministry, is never focused on local, visible problems for which citizens may have much greater insight and can also be a monitoring agency. Local schools and colleges are never invited in the problem-solving exercises. Our models and systems built on these models require a paradigm shift in that direction. PCBs will do well if they spend some budget on education, training, research and citizen-orientation.

In Western countries, two thumb rule criteria are used to mark the cleanliness and goodness of their cities. One is freedom from dust, pollution and noise. The other, I think, shows great foresight. It recognises the right of citizen to enjoy a ‘watchable’, ‘starry’ night-sky and hence puts restrictions on the frequency, intensity and the angle of inclination of street lights, so that the “starry night” is not masked in their glare. We are still way away from this.■

The writer retired as Chief Information Commissioner of Goa in the rank of Supreme Court Judge. She is an accomplished administrator, teacher, thinker and writer. She has travelled over 400 out of 650 districts in India and is proficient in many Indian languages. As an administrator she has worked in various departments which include education, women, children, industries, petroleum, agriculture, and health. Some of her service highlights are economic rehabilitation of Devdasis, making TV and radio serials for energy conservation, designing, training and framing policies for Yashada (Yashwantrao Chavan Academy of Development Administration) and promoting Indian languages on computers. Presently, she is actively pursuing revival of Sanskrit language. She has authored 25 books on diverse subjects.



A *salam* to Kalam!

There has been no Indian President in recent memory like him. The late Abdul Kalam was a pioneer in many things, not least of all in his humility while occupying India's highest office, and his all-consuming passion to reach out to the younger generation.

B. Ramesh Babu pays a tribute.

THE sudden and sad demise of the Peoples' President A.P.J. Abdul Kalam came as a bolt from the blue. Each and every Indian was overtaken by a deep sense of personal loss. An unprecedented outpouring of love and admiration for the "uncommon common man" was palpable across the vast land. What is most remarkable is that everyone – young and old, men and women, high and low, living in Kashmir or Kanyakumari, Ahmedabad or Arunachal Pradesh, were touched to the core of their being. "Gentlemen" in public life have become so rare that a rare feeling of adulation and love for the true gentleman, an unusual nationalist and a patriot in the best possible sense of that word, swept the nation. Kalam's transparent love for all, simplicity, integrity, dedication, and irrepressible optimism had a magnetic effect on one and all. He was a role model par excellence in an age and a country where good human beings are woefully scarce! What is remarkable is that throughout his life, especially after he ceased to be the President of India, he toured the nation, inspired youth and children to dream, and work hard to turn their dreams into reality. He believed that science and technology would enable them and the country to realise their goals.

As a scientist and leader in public life, he did everything possible to harness science and technology for the welfare of the common people, especially the poor and the vulnerable. For instance,



The late President Abdul Kalam, who was 'People's President'

Kalam partnered with scientists in the bio-medical field to develop and market a cheap and affordable stent for polio victims, by using the materials he helped create for the "nose" of his missiles! In the words of a polio stricken young lady from Hyderabad, "God has given me 'janma' (birth), but Kalam has given me 'punarjanma' (rebirth)".

The way he lived and conducted himself, whether in the imperial precincts of the Rashtrapathi Bhavan or in the mundane bylanes of Rameshwaram, were reminiscent of the fabled 'Karma Yogi' extolled in our scriptures. Though born into a poor Muslim household, he respected all faiths. His love for Carnatic music and *veena* are well known. He loved M.S. Subbalakshmi (MS, as she was popularly called) on par with his mother, who influenced him profoundly. While he was the President of India there was an occasion when the great

MS could not attend the concert he was to inaugurate, because she was unwell. Throwing all protocol out of the window, he directed his convoy to go to her house and called on her to enquire after her health! At a formal treat he hosted for all the Rashtrapathi award winners he had a chair fetched for an elderly lady who had difficulty in standing. Then he personally served her snacks! People around him were aghast. But for Kalam, it was the most natural thing to do!

Let me recount another episode. A scientist colleague in Kalam's office told him that he had promised to take his children to an exhibition in the evening. But once in the lab, he got absorbed in his work and forgot all about it. He later found that Kalam had sent a manager from the office to take the children to the exhibition! That was how Kalam was made! The greatest tribute we can pay to the departed soul is to work hard to fulfill his dream of transforming India into a developed nation with urban facilities in all villages. ■

The writer is the Scholar in Residence, Foundation for Democratic Reforms, a think tank and advocacy group based in Hyderabad. He was formerly the Sir Pherozeshah Mehta Professor of Civics



and Politics, University of Bombay. He was associated with the ASRC, ICFAI University, Institute of Public Enterprise, and the Central University in Hyderabad.

A school with a difference

Here's a silver lining in the dark cloud of the dismal education sector in India. A school in Chattisgarh and its Principal prove that it just needs a genuine love for education, parent participation and some creativity, to make learning enjoyable.

Purusottam Singh Thakur reports.

AS far as schools go, the Government Primary School in Motwada village in Kanker district, Chhattisgarh, is innovative, unusual, progressive, and inclusive. That's a whole lot of adjectives to describe a learning institution located in the otherwise violence-affected and poverty-ridden North Bastar region, but then the amazing work being done here by Headmistress Anusuya Jain, 51, and two other committed women teachers simply cannot go unnoticed.

From the impeccable, landscaped grounds to the neat and clean building, to the cheerful classrooms, the school has indeed created a reputation for being a model institution. "And not just the facilities, but the informal environment and interactive lessons encourage local children to come to school regularly, which is a definite change from the usual absenteeism and high drop out rates among government run institutions," points out Jain proudly.

At the Government Primary School in Motwada, classroom learning certainly takes on a whole new meaning. Instead of the customary chairs and tables, students and teachers sit together on the floor, interact with each other as equals and there is a concerted effort towards making lessons fun and informative for the young ones. Besides the classes, the modest campus, too, is lively and filled with creative artwork, alphabets, numbers and stories painted on the walls. "We apply the Multi Grade Multi Level (MGML) teaching method



The Government Primary School in Motwada village in Kanker district, Chhattisgarh, brings a wave of fresh change as women teachers and a committed headmistress make learning fun for students here. (Credit: Purusottam Singh Thakur/WFS)

here, which enables children to enjoy their class work and also develop confidence in their abilities. These are small children from the village and to engage directly with them and make them comfortable, we sit with them on the floor like their parents do at home", she explains.

It was in 2007-08 that MGML was introduced on a pilot basis in select government schools in the district with an idea to improve the quality of education and the learning abilities of the children. Under the MGML method, student groups are created as per their existing knowledge and learning capacities, and then they are promoted once they master a level. Although, unfortunately, due to the lack of teaching materials and proper training this programme has now been discontinued, but the school in Motwada, which was one of the first ones to be chosen for the

experiment, has been able to continue the good work.

The beginning of change

When Jain, a mother of two grown-up sons, had come to Motwada five years back things were being done quite differently. "While children were coming to school, it was not the inviting and stimulating place it should be. Moreover, there was no involvement of the parents in either the running of the school or what was being taught to their children. A School Management Committee (SMC) was in place, but it was inactive," she recalls.

For starters, Jain decided to do a small survey of the village to gather data, like the number of families, what they did for a living, the educational qualification of the parents, and so on. With the assistance of her colleagues and a few members of the SMC she



Instead of the customary chairs and tables, students and teachers at the Government Primary School in Motwada, sit together on the floor, interact with each other as equals and there is a concerted effort towards making lessons fun and informative for the young ones. (Credit: Purusottam Singh Thakur/WFS)

embarked upon this mission to better understand the mindset of the parents as well as their living conditions. Her findings were definitely enlightening – no one in the village had studied beyond Class 10 and most of the teenagers and elders were employed as daily wage farm labourers. But while their day-to-day life was tough, most harboured dreams of a better life for their children. “That attitude and hope is what has brought about the transformation. Right at the onset, I called a meeting of the parents and told them: ‘Do you want your children to become labourers? If not, then you have to pay attention to what your children are doing and play a part in the working of the village school’. The revival of the SMC has given a great boost to our work,” shares Jain.

Truly, the 16-member SMC, of which 14 are women, is functioning in tandem with the school authorities. It’s not uncommon for Committee President

Godavari Yadav and her deputy, Sabita Yadav, to drop by the campus to discuss the progress of the children, get an honest feedback from the teachers and even talk about any pertinent administrative issues that may need to be addressed. Elaborates Godavari, “We have learnt a lot by interacting with Anusuya *didi*. We have understood the value of good quality education and also know that as parents we need to be involved in the functioning of the school. After all, our cooperation can facilitate the teachers to give our children a better learning experience.”

Apart from that, these days, most mothers, including Godavari and Sabita, are keen on sitting with their children as they do their home assignments. “Anusuya *didi* has motivated us to sit with our kids while they are reading and doing their studies. Even if we don’t really understand what they are saying or writing, our attention eggs them to perform better and we, in turn, learn something new,” says Godavari.

Beyond the school

Of course, the synergy between the school and the villagers has gone beyond dealing with matters of education. The SMC and the panchayat members seek Jain’s opinion and advice on tackling other issues as well. Ramkumar Kuldeep, who is a member of the SMC, reveals, “Everyone is of the unanimous view that Anusuya madam and the other teachers are our well wishers and can provide sound guidance on a variety of issues. Just recently, when there was a proposal before the panchayat to merge Motwada into the Kanker Municipality, we were not sure what this would mean for our village, whether it was a beneficial move. After we came together and consulted with her we decided to reject the proposal and went confidently to the District Collector. Anusuya madam is always ready to talk to us and share her personal point of view. We can take

our personal problems to her, too.”

Be it information on maintaining good health and hygiene or how to support children in their education or learning the right social etiquette, Jain is at hand to show them the way. She vividly recalls how she patiently taught her students the value of cleanliness and the merits of keeping the school grounds neat – something that has had a ripple effect in the entire village. “Today, our campus is green and we have planted a variety of colourful flowers and plants. No one plucks flowers or litters in the garden. Earlier, this was not the case. Parents used to ask their children to pick flowers to offer in the temple. So I decided to tell students to take saplings and plant them at home. Once they had their own flowers they stopped plucking. One has to think of easy, workable solutions instead of dwelling on the problems”, smiles Jain.

The first one to come everyday and the last one to leave, Jain has generously shared her time and tapped into years of experience to ensure that the school delivers on the promise of quality learning and also make Motwada a better place to live. On their part, villagers like Ramkumar Kuldeep are quick to acknowledge her contribution, “Madam has transformed the school and has even enthused our children to work hard and do well. Her dedicated approach is appreciated by everyone in the village.”

It was a decade ago that the National Council of Educational Research and Training (NCERT) had created a revised National Curriculum Framework (NCF) with the express idea of building a schooling system that would reduce children’s burden and, at the same time, facilitate learning. The Government Primary School in Motwada is among the few schools that have been able to realise this goal. ■

(© Women’s Feature Service)

Nobel laureates urge India to fight climate change

The Lindau Nobel Laureate Meetings held in Germany this year concluded with an appeal to fight climate change and reduce carbon emissions. The Lindau Meetings also focused on the crucial role that India could play in this, reports Anuradha Sharma, who attended the colloquium.

INDIA, along with China, will play a crucial role in the global fight against climate change. This was once again underlined by Nobel-winning scientists at the 65th Lindau Nobel Laureate Meetings held in the Bavarian island of Lindau in Lake Constance, South Germany, from June 28 to July 3, 2015.

On the concluding day of the colloquium, 36 of the Nobel laureates signed on the Mainau Declaration on Climate Change, calling for decisive action on the part of the world to reduce carbon emissions. A day before the signing of the Declaration, five Nobel laureates - Brian Schmidt, Steven Chu, George Smoot, David Gross, Peter Doherty - addressed the press jointly and spoke about their coming together to sign a declaration against climate change. Role of India and China, the two big polluters of the world, was emphasised by most of them.

The India role

Gross spoke of his recent trip to Ladakh during which he came in contact with Himalayan communities living on the “edge of survivability”. He said that the fragile communities were worried about their survival amidst increasing concerns over climate change. “It was very touching and sad to see them talk about the rapid changes they are experiencing,” he said. “They can see the glaciers melting...A few more changes like that and they are gone”.

Later, I spoke to some of them about their views on what steps India can take to fight climate change and global warming. They called for more government action in promoting solar power, building energy-efficient infrastructure

and investing in technology innovation. “India has some very, very smart people, and a very innovative industry,” Doherty said. “India needs to innovate in areas like renewable energy”, he added.

Recalling from his trips to India, Doherty told me that, big cities apart, he was particularly shocked by the pollution of rural areas and small towns: “I’ve been to India several times (Mumbai, Delhi, Bangalore, Mangalore, etc) and also to a lot of rural areas. The cloud of pollution right in rural areas was terrible”. According to him, particularly in the villages, the use of solar power will prove to be more effective. And keeping in mind the influx of people in cities, he said, “It is really important that the cities be constructed with energy efficiency in mind”.

Climate change is a major topic of discussion this year, in the light of the upcoming United Nations Conference on Climate Change to take place in



Indian Nobel Winner Kailash Satyarthi addressed the Lindau Meetings

Paris this November-December, and the Mainau Declaration of Nobel laureates hopes to influence opinion in favour of a global consensus on climate change and take “decisive action to limit future global emission”.

The Mainau Declaration

Nobel laureate Brian Schmidt, who is also the spokesperson for the Mainau Declaration, said in his speech introducing the declaration that it was a “moral obligation” on the part of the Nobel laureates to come together on an issue that has lasting consequences. “We want the decision makers of the world to be empowered to know what the best science is. We also want to hold the decision makers responsible for charting the future course of humanity. It is their responsibility to make and chart the course which is the correct one. And

we believe they should be using the best possible science to do so," he said.

Here are some extracts from the declaration:

Successive generations of scientists have helped create a more and more prosperous world. This prosperity has come at the cost of a rapid rise in the consumption of the world's resources. If left unchecked, our ever-increasing demand for food, water, and energy will eventually overwhelm the Earth's ability to satisfy humanity's needs, and will lead to wholesale human tragedy. Already, scientists who study Earth's climate are observing the impact of human activity...

Based on the IPCC (Intergovernmental Panel on Climate Change) assessment, the world must make rapid progress towards lowering current and future greenhouse gas emissions to minimise the substantial risks of climate change. We believe that the nations of the world must take the opportunity at the United Nations Climate Change Conference in Paris in December 2015 to take decisive action to limit future global emissions. This endeavor will require the cooperation of all nations, whether developed or developing, and must be sustained into the future in accord with updated scientific assessments. Failure to act will subject future generations of humanity to unconscionable and unacceptable risk.

India's Kailash Satyarthi, who won the Nobel Prize for peace in 2014, is among those who signed on the declaration. While the conference, dedicated to interdisciplinary scientific exchange, was for Nobel winners in the field of science, Satyarthi and Nigerian Wole Soyinka, 1986 Nobel Prize winner in Literature, were the two laureates from other disciplines who delivered special addresses at the conference.

While Satyarthi called for greater budgetary allocation for children's education, Soyinka touched upon how internet was spreading radicalism

The Department of Science and Technology (DST), GOI, is one of the partners of the Lindau Nobel Laureates Meetings. R.K. Sharma, Scientist-E (Director), International Cooperation Division, DST was in Lindau to co-ordinate India's participation at the conference. Excerpts from an interview (for the full interview kindly check the blog on our website: www.oneindiaonepeople.com)

What is DST's association with Lindau Nobel Laureate Meetings?

DST is associated with Lindau Nobel Laureates Meetings from 2001. So far, DST has deputed and supported about 345 students in 15 batches to attend the meeting.

among the youth, in the wake of rising fundamentalism and terrorist activities of outfits like Boko Haram, ISIS (Islamic State of Iraq and Syria), etc.

The six-day conference saw the coming together of 65 Nobel laureates - one of them being the Indian-born British American molecular biologist Venkatraman Ramakrishnan - and about 650 young scientists (from masters, PhD and post doc levels) from different parts of the world. There were more than 30 young scientists from India. The conference was marked by open lectures, panel discussions, master classes and various other formal and informal events, during which the young scientists interacted closely with the greatest brains from the world of science.

Three of the Nobel Laureates were women scientists--Ada Yonath, Elizabeth Blackburn and Françoise Barré-Sinoussi - and 42 per cent of the young scientists comprised women scientists.

The Lindau Meetings have come a long way since its humble beginnings in the post-war era of the last century. Two doctors from Lindau - Gustav Parade and Franz Karl Hein - conceived this idea in the year 1949,

How does attending the Lindau Meetings encourage the young scientists of our country?

The students who are basically in the very early stage of their research careers, are motivated to get involved and interact not only with Nobel Laureates, but with their peers and fellow students from other countries.

What was the selection process? How many applicants were selected and on what basis?

Based on the eligibility criteria prescribed by the Lindau Council, DST invites applications from Indian students through advertisements in leading daily newspapers in all states of India. The final selection is done by the Lindau Council.

just four years after the end of the World War II, during which Germany faced alienation from the rest of the world and was excluded from the global scientific exchange. The larger objective was to make Germany a part of the global scientific exchange. Count Lennart Bernadotte of Wisborg became the patron and, in 1951, the first "European Meeting of Nobel Laureates" was held with just six Nobel laureates. Over a decade or so, the Meetings assumed a truly international character with young scientists being invited from all the continents.

The theme of the Meetings generally keeps rotating between Physiology and Medicine, Physics and Chemistry. An interdisciplinary meeting involving all three natural sciences disciplines is held every five years. This apart, the Lindau Meetings on Economic Sciences are held every three years. ■



The writer is a Calcutta-based independent journalist. She attended the Lindau Meetings on invitation from the Council for the Lindau Nobel Laureate Meetings.

Climate change and impact on coastal societies

When we talk of global warming and climate change, we have to understand that it affects every ecosystem on Earth, including the very vulnerable coastal ecosystem.

Shanta Ghosh dwells at length on the impact of global warming on India's vast coastal zone.

In recent years there have been a lot of discussions about climate change. Why it occurs, how it occurs, and how it affects our life. The climate change phenomenon is not a new occurrence. What is new is the understanding of climate change from various dimensions, through the understanding of 'science of climate change'. Research carried out by scientists show that basically climate change has been caused by the release of carbon dioxide and other 'greenhouse gases' into the atmosphere as a result of energy consumption by human activities.



Our development agenda has largely contributed to global warming

The greenhouse gases

Greenhouse is a closed house generally used for gardening where sunlight is allowed through any transparent glass or other materials. This helps to convert the same into heat, that is stored as thermal energy. So even after the sun sets, it releases that energy slowly and properly.

In our atmosphere, some chemical compounds are available in the form of gases like carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), fluorinated gases etc., which can trap heat from the sun. The molecular structure of these gases enable them to absorb heat available from the sun during day time, and keep the atmosphere warm at varying magnitude at various geographical locations,

generally known as global warming. Since the process of warming by absorbing the heat is similar to that of a 'greenhouse', these gases are known as 'greenhouse gases'. Therefore, when more greenhouse gases are available in our atmosphere mainly due to industrial activities, the capacity of the atmosphere to retain heat from the sun would be greater. When a greater quantum of heat is retained in the atmosphere, it leads to warming of the atmosphere. If more greenhouse gases are retained in the atmosphere at a faster rate, there will be faster warming indicated by faster temperature rise, and all the irregularities of the natural system of functioning on the Earth, known as 'ecosystem functioning', would be interrupted.

The beginning of global warming

Human activities in the form of energy consumption, have contributed these greenhouse gas emissions to the atmosphere, since the year 1764, with the invention of the spinning engine and the growth and spread of industrial revolution. Carbon dioxide emissions into the atmosphere started. But at that time or even long thereafter, till World War I, the retention of CO₂ in the atmosphere was not at an alarming rate. But when – (i) population growth started to increase at an alarming rate, and thus, food requirement also shot up and (ii) rural deforestation started to make available more agricultural land for food production; and (iii) rapid cutting of trees and plantations in the urban and sub-urban areas started happening

– all these simultaneous activities increased the greenhouse gas retention in the present day atmosphere, thereby causing the Earth's surface temperature to rise at an alarming rate.

With the growth of industrial development, the energy consumption level of human society has increased phenomenally. This negative impact has been aggravated by deforestation. In the absence of deforestation, trees and phytoplankton would have absorbed the CO₂ for their own needs, thus resulting in: (i) reduced volume of such gases in the atmosphere, reducing the capacity to retain the heat available from the sun, and slowing the atmospheric warming, and thus mitigating naturally the temperature rise; and (ii) release of Oxygen or O₂ into the atmosphere, which is required for all living and non-living resources on planet Earth.

What is coastal society?

Coastal society is a society that has grown in the coastal zone and enjoys both the privilege of coastal ecosystem functioning as well as of the nearby hinterland, i.e., the land away from the coastal zone. Coastal society summarily means the demography or the population dynamics of a coastal zone. Our perception of the coastal society has components like: (i) people with low economic status; (ii) both male and female adult members of most of the families are daily wage earners; (iii) most of the working people are fisherfolk by profession; and if such coastal zones are designated holiday destinations or used for coastal tourism purpose, the fisher folk can work for their livelihood as (iv) service providers to hotel and resorts as temporary or permanent employees; (v) independent small traders of handicraft through shops or seller of food items like coconut (most of the coastal areas have plenty of coconut trees) or fish caught from the nearby coastal waters; and (vi) local transport and tour operators.

All these demographical components of any coastal society put together sustain the local economic growth of any coastal society, and there is no doubt that all such components are fully dependent upon robust 'coastal ecosystem functioning'.

The coastal ecosystem functioning

The dynamic operational way of an ecosystem in a coastal environment influenced by offshore marine environment may be called 'coastal ecosystem functioning'. Since the components of a coastal ecosystem varies from coast to coast, the operational way of functioning of coastal ecosystem varies – most surprisingly the end product, i.e., release of oxygen and sequestering the carbon dioxide. If this is accepted, it can safely be said that coastal ecosystem, through its 'operational way' or functioning provides direct services to human beings.

Relation between a coastal society and coastal ecosystem (services)

In order to understand the relationship between the 'coastal ecosystem functioning' and 'sustenance of livelihood of a coastal society', it is necessary to understand the resultant factors of any ecosystem functioning. Components of natural coastal ecosystem are enormous, complex, and varying in nature – from planktons to mega-consumers like humans. Deliverables or the products of coastal ecosystem functioning are of two types: (a) goods and (b) services.

Green planktons absorb the CO₂ from the atmosphere and fix it as food through the process of photosynthesis, to provide fish and other economically valuable fishery food for their growth and the fisher folk catch and sell the catch to local markets or to the exporters. Also through coastal ecosystem functioning, O₂ is released into the atmosphere – simply put, enabling us to

breathe! Therefore, a particular coastal ecosystem provides: (i) direct services to human beings by converting CO₂ into O₂ and, (ii) providing the serene coastal environment that people can enjoy through coastal tourism.

Impact of climate change on a coastal society

Various scientific reports have opined that because of high energy consumption and rapid deforestation in the land area along with the coastal deforestation caused mainly by the oil pollution at sea, have reduced the capacity of carbon sequestration (absorption to fix) by plants at land surface. This has also led to the killing of plankton in the seawater, change in the chemistry of air-sea interaction of CO₂ resulting in ocean acidification. This means, the alteration of marine biogeochemical cycles, in turn altering the coastal ecosystem functioning, upon which the very basis of coastal society depends.

Not only has the availability of 'goods' and 'services' of the marine and coastal environment altered, but because of excess of heat in the lower atmospheric level down to the upper layer of the seawater, the health of the coastal environment is also deeply and adversely affected. We need to decide now, and immediately, how such a trend of adverse impact on the coastal society can be reversed. ■

Shanta Ghosh has specialised in Coastal Geomorphology and works as a senior scientist at the Asian Marine Conservation Association (AMCA). She is also its co-founder and member of the governing council. She has a vast experience about various coasts



of West Bengal, Odisha and Andhra Pradesh and also has a number of research publications to her credit that have received international recognition.

Safe cities and gender budgeting

Gender budgeting is the need of the hour, as is evident from the increase in crimes against women. Never has there been a more pronounced need for better budgetary allotments to make women's spaces safe and convenient, says Dr. Vibhuti Patel.

URBANISATION often goes hand in hand with a rise in urban violence and crime that manifests itself in stalking, sexual violence, blackmailing and extortion rackets. Children and women are seen as soft spots who can be victimised by predators.

Smart cities, also safe cities?

Town planners, policy makers and budget experts need to do gender budgeting, incorporating facets such as women-friendly civic infrastructure - water, sanitation, health care, safe transport, public toilets, helplines, skill development for crisis management and, safety at work place. While preparing budgets for social defense services, consideration must be given to safety of girls and women in schools and colleges in terms of prevention of child sexual abuse, through public education and counselling facilities, separate toilets for girls and boys in schools, legal literacy on POCSO Act, 2012 and Prevention of Sexual Harassment Workplace Act, 2013, special cells in the police department to take action against display of pornographic images, cybercrimes that victimise young girls at public places, in public transport - buses, local trains, rickshaws and taxis. Installation of panic buttons for customers in rickshaws and taxis need to be made mandatory in all cities. Women vendors and child workers, women employees working in the night shifts (who are highly exposed to unwanted

sexual advances and petty harassment). Hence, budgetary allocation for referral centres /information desks should be provided in markets and public places.

Urban infrastructure and safety of women

From the point of view of macroeconomic policies, gender friendly infrastructure plays a pivotal role in creating gender friendly cities. City planners need to make budgetary provision for safe housing and night shelter for homeless women, and half way homes for elderly women.

Budgetary allocation for installation of CCTV cameras must be made at all public places, highways and streets in the business hubs. Proper street lighting in the peripheral areas of the city is vital for safety of citizens, especially women, children and senior citizens. Safe, clean and free toilets for women at railway stations, bus stops, markets, public places are urgently required in the cities. Budgetary allocation for gender sensitisation workshops for police personnel is important to change the mindset of 'victim-blaming' among them.

For women, feeling safe is to feel protected. It is a feeling of well-being which can envelop a family, a community, a neighbourhood and a city. Its composition is hard to decipher, but it is an all-encompassing feeling of calm which is often as invisible as clean, unpolluted air. Safe cities ensure more freedom, less confinement and control,

and enhance women's opportunities to travel, to attain education-job-career.

What is a gender sensitive budget?

A gender sensitive budget demands re-prioritisation of financial allocations by municipal bodies in favour of:

- Women's hostels, crèches, cheap eating facilities, public toilets
- Women-friendly and safe public transport be it local trains, metros, buses or autorickshaws
- Housing subsidised for single/ deserted/ divorced/ widowed women
- Strengthening PDS (public distribution system), mid-day meals
- Abolition of user fees for BPL (below poverty line) population, one stop crisis centre in public hospital for women/girls survivors of violence linked with shelter homes
- Skill training centres for women and tailor made courses
- Safe, efficient and cheap public transport - bus, train, metro
- Safe drinking water in the community centres
- Occupational health and safety of recycling workers/rag pickers
- Proper electrification in the communities
- Multipurpose community centres, half-way homes for elderly and mentally disturbed women

Method of revenue generation

Several state governments have allotted 5% of total revenues for women and children. This should be

increased to 10%. Kerala has done this. Moreover, urban local self-government (LSGs) bodies can raise revenues by heavy taxes on tobacco, alcohol, private vehicles and entertainment industry. A portion of the fine collected for causing damage to environment (introduction of Green Tax), high speed driving, wrong parking and breaking rules can be used for welfare of women and children.

Civil society groups must be allowed to give their opinions on suitable budgetary allocations and generation of revenues from local sources. They can verify/cross check collected data and results of the surveys/interactive workshops, and prepare a vision document.

Women's groups are discussing micro economics involved in dealing with problems faced by women at ward levels such as drinking water, health centers, garbage disposal and are moving beyond grievance redressal. Women's groups such as Anandi (Ahmedabad), Alochana (Pune), Stree Mukti Sangathana (Mumbai), National Alliance of Women's Organisations (Bhubaneswar), Singamma Srinivasan Foundation (Bangalore), Action India (Delhi), are organising workshops for awareness about technicalities of budget, building knowledge about programmes, schemes, projects under different departments, gathering procedural information about critical issues/felt needs, skills of proposal writing.

With this perspective in mind, urban LSGs have to work for gender budgeting. Striving for 'Gender-friendly' cities has become a strategic objective of the urban planners, policy makers and practitioners. Citizens' fora, community based organisers and NGOs are publicly debating the issues concerning revenue generation and public expenditure of the urban bodies with gender lens. Right to information (RTI) has proved to be an important tool in the hands of

civil society for transparency in public expenditure.

Gender budgeting in urban LSGs

The process of gender budgeting demands special programmes targeting women, based on enumeration of differential impact of expenditures across all sectors and services - gender disaggregated impact on literacy, school drop outs, mortality, morbidity, malnutrition, illnesses, safety and security. Hence, they need to ensure the review of equal opportunity policies and opportunities in the public sector - jobs, school education, wages, health care, skills, technical training, and computer education.

State governments must devolve substantive powers, funds, functions and functionaries upon urban LSGs.

The following classification of financial allocation on schemes and programmes for gender audit as well as gender budgeting have been recommended:

- Women specific schemes where 100% of the allocation is required to be spent on women
- Pro-women schemes where at least 30% of allocation and benefits flow to women. E.g., all anti-poverty programmes
- Gender neutral schemes meant for community as a whole

Need of the hour

State governments must devolve substantive powers, funds, functions and functionaries upon urban LSGs. The central government should strive for simplification of programme guidelines by central ministries and departments regarding women specific schemes.

Structures and mechanisms for RTI Act must be put in place to sort out problems concerning utilisation of funds allocated for area development. To avoid urban unrest and guarantee socio-economic justice, at least 100 days of employment at minimum wages must be provided under EGS in all urban centres. Elected representatives, ward officials and NGOs working in the area should act as facilitators in preparation of the plan for area development and social justice.

Conclusion

Budgets garner resources through the taxation policies and allocate resources to different sections of the economy. It can help to reduce economic inequalities between men and women as well as between the rich and the poor. Hence, the budgetary policies need to take into consideration the gender dynamics operating in the economy and in the civil society. There is a need to highlight participatory approaches to pro-poor budgeting, bottom up budget, child budget, SC budget, ST budget, green budgeting, budgeting for differently abled people, local and global implications of pro-poor and pro-women budgeting, alternative macro scenarios emerging out of alternative budgets and inter-linkages between gender-sensitive budgeting and women's empowerment. Gender economists must lift the veil of statistical invisibility of the unpaid 'care economy' managed by poor women, and highlight its equality and efficiency dimension, and transform macro-policies so that they become women friendly. ■



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The eye exotica

Nothing enhances a woman's beauty as much as a line of lovingly applied kaajal or kohl in her eyes. Used by brides, dancers, queens, courtesans and young girls alike, the kohl is truly a beauty enhancing product. Its health benefits just add to its allure, says Shoma A. Chatterji.

“EYES are the windows to the soul”, is a saying we have heard since we were knee-high. The beauty of the phrase did not register then. But as time went on, the elaborate eye-make-up on Vyjayanthimala's eyes when she performed a *Varnam* from her repertoire of Bharat Natyam at a Mumbai theatre many years ago, one witnessed how exotic and attractive eyes can be made to look with a traditional enhancer like the *kaajal*, known in English as lamp-black. Bridal make-up in any part of India makes eye make-up mandatory. The best form of eye make-up that is traditional and beautiful is *kaajal* or kohl or *surma*. It existed in the world much before modern and sophisticated lines like the eye-liner, the mascara, the eye-shadow, the false eyelash stepped into the cosmetic scenario. Literally, *kohl* means, 'to brighten the eyes'. So, when the bridegroom looks into the *kaajal* lined eyes of his bride, her eyes appear to be the most beautiful in the world at that moment.

The recipe

The basic recipe for *kaajal* is simple – it is made of soot. This soot is collected on a small upturned bowl held atop the flame of an oil lamp. This soot is used to beautify the eyes. Another way is to take a tiny piece of camphor or almonds, set it alight, and hold a clean teaspoon over the flame to collect the soot. Your *kohl* or *kaajal* is ready for single-time use. The smudging effect can be reduced by mixing a little castor oil to the soot.

There are a hundred different ways of preparing *kaajal*. They vary in their elaborate recipes. The ingredients that compose the flame are said to transfer their beneficial values to the soot. Ingredients used in another preparation (sandalwood/*Manjal karsilanganni*, castor oil, ghee) are believed to have medicinal properties. They are still used in Indian therapies like Ayurveda and Siddha medicines. This lamp black is used on new-born infants till they are one or two years for the good health of the eyes. A small black dot of this soot-made *kaajal* is applied on the baby's chin or on one side of the forehead as a ritual to ward off the 'evil eye'.



Kaajal enhances a woman's eyes

Kohl is known by various names in South Asian languages, like *sirma* or *surma* in Punjabi, *kaajal* in Hindi and Urdu, *kaajal* in Bengali, Assamese, Oriya, *kaatuka* in Telugu, *kan mai* in Tamil and *kaadige* in Kannada. In Kerala, women of the household still prepare the *kaajal*. Local tradition considers it to be a very good coolant for the eyes and believes that it “protects the eyesight and vision from the sun”. In Punjabi culture, *sirma* or *surma* is a traditional ceremonial dye, which predominantly men of the Punjab, especially the Sikhs wear around their

eyes on social or religious occasions. It is usually applied by the wife or the mother of the male. Traditional Muslim men, who stick to the conventional Islamic style of dress, use the *surma* whenever they step out. But one does not know whether they wear it as an ornamental cosmetic or as a mark of their Islamic identity.

This conventional style of eye make-up is neither new nor culture-specific to India. Catherine Cartwright-Jones in her researched book (2005) unfolds the ancient practice of *kaajal*. In Rome, women painted their eyelids and brows with a black eye cosmetic. They applied the colour to their eyes by dipping a feather into prepared soot and pulling it between their nearly closed eyelids. Some women believed that blackening their eyelids and eyebrows would protect them from the glance of the “evil eye”, and also prevent them from transmitting the “evil eye” to another person. Most women applied *kohl* every week, or for any social occasion, except during *Ramadan*, when *kohl* and all hennas are set aside. Eye paints were nearly universal across North Africa, the Middle East, and South Asia. The black paint provided relief from the glaring sun and reflection from the sand before sunglasses were invented. Lamp-black was the most common source of pigment.

The use of kohl the world over

Traditionally, *kohl* was used by men, women and children in Egypt, North Africa and India for its supposedly therapeutic qualities. It was believed

(Continued on page 52)

Chhau, the hoary art form

The Chhau folk art forms – whether they belong to Orissa, West Bengal or Bihar – have many commonalities and some pronounced differences. Here, Dr. Kanak Rele describes the Mayurbhanj Chhau of Orissa and the Purulia Chhau of West Bengal, in vivid detail.

The Mayurbhanj Chhau

Mayurbhanj Chhau originated in Orissa (now Odisha). This was once a state and adjacent to it were the states of Saraikela and Purulia, the former today a part of Bihar, and the latter a part of West Bengal. The entire composite area where all the three Chhau traditions belong is teeming with a large number of tribes. Many of these tribes are agriculturists or cultivators, and are bound by rituals which symbolise veneration of fertility.

The Mayurbhanj Chhau, though reflecting village culture, also exhibits very strong influence of tribal elements as well. This dance is traditionally performed close to Dussehra and also to celebrate the Chaitra Parva.

A very distinctive feature of this dance is that the *gurus* are called 'Ustaads'. It is very obvious that at some point in time this term, which belongs to the Urdu tradition, came to be adopted in the Mayurbhanj Chhau terminology. The 'Ustaads' and musicians offer prayers at a temple dedicated to Lord Bhairava as a preliminary ritual before starting the actual Chaitra Parva. At this propitiatory ceremony, new dancers are ritually initiated. There are other rituals also that have to be performed. There is the worship of a pitcher which is called the *nishighata* (the night pitcher) also called '*kaamanaa*' or desire, which is supposed to represent *Shakti* (the female energy). There is also a ritual of offering scented sweet drink called 'pana' to the Sun god to propitiate



Mayurbhanj Chhau

him and seek his protection. All these rituals clearly have their deep roots in the Hindu philosophy from times immemorial and have deep symbolic meaning. It is apparent that the totality of Chhau as an institution was meant to achieve religious, social and cultural integration by encompassing different streams of Hindu religion.

In the growth of this stream of Chhau, it is evident that the technique of ancient warfare, in the form of martial practices, has played a very important role. This tradition has embraced the tribal dances which collectively morphed into Chhau. Like the Saraikela stream, the Mayurbhanj also received royal patronage. Chhau was well suited for an important three-pronged purpose – perpetuating an art, retaining and nurturing the royal tradition of martial practices, and bringing about the integration of the princely culture with tribal culture.

Evolution and growth

In the initial stages of its development, the Chhau was limited to

the performance of *Rookmaar naach*, which means 'the dance of mock fight'. As the system developed, many more themes with a special emphasis on heroic deeds were added to the repertoire. Thus, the stories from the Ramayana and Mahabharata, the Puraanas and the Bhagawata, came to be enacted together with Shiva, Parvati, Krishna, Vishnu and other gods and demi-gods from the Hindu pantheon. This development towards portrayal of characters and enactment of dramatic themes very naturally ushered in a more polished level of stylisation. During the later stages of development, to bring in uniformity, the Saraikela Chhau started using masks for every character, whereas the Mayurbhanj Chhau totally discarded the mask.

Without the mask, the Mayurbhanj stream adopted a high level of stylisation in the performance technique which retained extreme virility of the original martial practices. This resulted in excellence in choreography, specially of groups. In Mayurbhanj Chhau, it is the movement alone that becomes visual poetry, a poem that is redolent with nature and her manifestations like storms, rivers, lagoons and the sun.

The technique of Mayurbhanj Chhau, though quite distinctive, has certain similarities with that of Saraikela. But in Mayurbhanj the movements are broadly divided in three groups, each with its own specific mood: *Hatiaardhara* (holding of weapons), *Kalibhanga* (bending of a bud) and *Kalikaata*

(cutting the tender sprig). Like the other Chhau streams, *ufflis* and *topkas* make up the dance patterns. Totally, there are 36 *ufflis*; of special beauty are the *ufflis* that are inspired by the daily chores of a housewife. These are unparalleled and their equivalent is not to be found in other dance traditions. These *ufflis* reveal the rhythm and the charm hidden in even the mundane activities of a housewife.

There are three types of dance in the Mayurbhanj Chhau: *Phoot naacha* (solo dance), *Jodi naacha* (duet dance) and *Mela naacha* (group dance). Each dance presentation has three successive stages as progression:

Rangabaajaa: Play of music which takes place behind the screen and cannot be seen by the audience. It prepares the dancer to achieve the mood of the dance, making him forget the corporal, worldly surroundings.

Chaali: After *Rangabaajaa*, the orchestra plays the basic tune of the dance. Here, after the curtain rises, the different characters come down the stage into the centre of the dancing space in a very stylised way of walking called *Chaali*.

Naacha: The thematic content of the dance is developed and the drama is built up.

Naatki: A fast tempo is built up with great vigour. This stage is characterised by fast paced movements with intricate choreographic patterns.

Due to this extreme vigorous



Actors wear masks in Purulia Chhau

dancing, it is thought that they are totally unsuitable or out of the reach of women and thus the female characters are essayed by men only. The music for Mayurbhanj Chhau is mainly inspired by the folk songs of the region. Of late, Hindustani ragas are also incorporated. The tunes are played on the *Mahori*, which is a wind instrument resembling *shehnai*. The rhythm is provided by the percussion instruments like *dhol*, *chadchadi*, *tikra*, and the *dhumsa*.

The Purulia Chhau

Mayurbhanj Chhau of Orissa and Saraikela Chhau of Bihar represent a relationship that arises out of a common tradition of dance, which has its roots in martial practices. Yet another facet of this tradition is Purulia Chhau of West Bengal. It exhibits facets of the other two traditions – it embodies the vigour of martial grandeur, and an epic style of performance which is akin to that of Mayurbhanj Chhau; at the same time, like Saraikela Chhau, it is a masked dance presentation.

Unlike Saraikela Chhau, Purulia is not performed by the princes. On the contrary, it appears to be the preserve of what is termed as socio-economically backward classes. But today it is this class of people who are repositories of a tradition of dance and music which is highly developed and rich in its content. From the outside this tradition appears to be popular art, but when it is studied in-depth, it is beautifully structured with a highly sophisticated form.

The geographical area from which Purulia Chhau hails is inhabited with many scheduled castes and tribes, whose cultural ethos exhibit overlaying of faiths and beliefs of their tribal ancestors by the later Hindu emergence of the Vaishnava sect.

Like Mayurbhanj and Saraikela Chhau, Purulia Chhau is also an open-air performance. There is a 20 feet by 20 feet area in the open ground, which



A scene from Purulia Chhau

can best be described as the stage in the modern parlance. The audience sits on three sides of the area. The musicians sit together on one side. The performance begins at night by 10 p.m. There are, like in the other two, pre-performance rituals to be performed.

The performance begins with the entry of the orchestra. Then enters a dancer who wears the mask of Ganesha. The entry of Ganesha signals the beginning of the dramatic episode. Then on, the story moves forward swiftly with quick entries and exits of other characters. The stances and the stylised walk employed by the actors are similar to the other two Chhaus. Earlier, lighting was provided by mobile lightmen bearing flaming torches on their heads; now they use petromax lights which lessens the dramatic impact.

The music variety is rather limited. Connection with Hindustani music is negligible. The dance is always accompanied by a wind instrument which resembles the *shehnai*. The percussion instruments - the *dhol* and the *dhumsa* are almost similar to Mayurbhanj Chhau. The *taala* cycles are very complex and unlike any other known systems.

The dance technique of Purulia Chhau exhibits some similarities with the other two Chhau streams. There are some specific individualities also. The animals crawl on all fours, the birds leap and jump. All parts of the body are effectively used. There is the walk on knees and pirouetting on the knees. At the same time, certain *ufflis* and *topkas* of the other two can also be discerned.

Certain movements are very forceful, representing attack and defence of the martial tradition. Really breathtaking are the leaps and jumps where the actor/dancer lands on the ground on his knees, which is the unique feature of this dance-drama style. The extensive use of the torso and expressive use of the lower limbs are different from those of the other two Chhaus. Purulia Chhau exudes dynamism.

The mask

No discussion on Purulia Chhau can be complete and comprehensive

without mentioning the most distinctive quality of the masks. The Saraikela masks are highly refined, smooth and stylised and courtly in their effect. The eyes are expressive but never drawn realistically.

In Purulia, the same characters create totally different effects. They represent very vital, aggressive beings, raw masculinity, without any delicacy or lyricism, yet they are strangely realistic.

Unique to Purulia Chhau are the masks for birds and animals which completely mask the entire body. The birds are shown with a pair of wings,

a head and face mask and costume which represents the body of the bird. In Saraikela the masks are made of wood, whereas in Purulia they are made from the mud collected from streams and rivers. ■



The writer is Director, Nalanda Dance Research Center and is a recipient of Padmabhushan award, Akademi Ratna (Fellow of Sangeet Natak Akademi)

The eye exotica

(Continued from page 49)

to protect against eye disease and its blackness was thought to control the sun's glare in the desert. It was also thought to be a powerful measure to ward off the evil eye. Ironically, the very substance that indigenous people used for centuries with much belief in its benefits is now being interpreted as being harmful.

It has been discredited as a source of lead poisoning. The FDA has banned the import of kohl and kohl-derived products in the U.S. Kohl contains heavy metals lead and antimony, which are very toxic when applied on the skin. Today, commercially manufactured sticks of kaajal, that look like lipstick, and even surma powder and kaajal paste are said to contain dangerously high levels of lead and other toxins. Surma and Kohl powder are dangerous for the same reasons. But in January this year, French researchers have alleviated our fears by reporting that the heavy eye makeup may actually have had medical benefits. At low levels, the lead, theoretically harmful, actually stimulates the immune system by producing nitric oxide.

Egyptian queens applied kohl around the eye, extending outward and upward in the corners, something only the royals

and the gods could do. A delicate inner extension that seemed to join the two eyebrows was also in fashion at the time. Much later, the fashion changed. A line of kohl was drawn from the outer corners of the eyes to the front of the earlobes. In Morocco, Kohl is a symbol of the Kaaba, Islam's holy black stone housed in Mecca. Most North African mothers applied kohl to their infants soon after birth, not only on the eyes, but also on the eyebrows and umbilical cord. This was done to make the eyes bright and strong, as well as to adorn the baby with a personal amulet to ward off the evil eye.

Interestingly, the 'evil eye' quality of kohl is mentioned for every culture where it was used as an eye adornment. Indians use the index finger to apply it but most other cultures use an applicator to apply it. Dancers usually apply it with a brush and use an improvised form of kohl, usually a thick black paste or paint, because their eye-make-up is elaborate. Today, most brides who believe in conventional bridal make-up insist on getting the make-up person to do up their eyes like the Bharat Natyam, Odissi, Kuchipudi, Mohini Attam, Manipuri and Kathak dancers do. For dancers, there is no

gender divide for kohl because men too use elaborate eye make-up to underline the eye expressions that form part of the dance mudras. Male Kathakali dancers wear the most elaborate and complicated form of eye make-up before their performance.

Courtesans, kothewallis, prostitutes and court dancers wear either kohl or surma as a mandatory part of their make-up and costume. Looked at from this perspective, kaajal is perhaps the most democratic and egalitarian form of facial make-up in history. Bar dancers do likewise, though cabaret performers use it as a personal option. Nothing ritualistic seems to be behind the practice of wearing the kaajal specifically addressed to the Indian bride in Indian weddings. ■

The writer is a freelance journalist, film scholar and author. She has authored 17 published titles and won the National Award for Best Writing on Cinema, twice. She won the UNFPA-Laadli Media Award, 2010 for 'commitment to addressing and analysing gender issues' among many



awards. She is currently Senior Research Fellow, ICSSR, Delhi, researching the politics of presentation of working women in post-colonial Bengali cinema 1950 to 2003.

The double whammy

In the last decade, new commercial crops were introduced like Bt cotton, which have wreaked havoc with the small farmers' cropping patterns and food security. A lot more thought has to be applied before introducing such crops.



Bharat Dogra

is a Delhi-based freelance journalist who writes on social concerns.

VARIOUS rural communities have evolved cropping patterns keeping in view the primacy of their food needs. What is more, these crop rotations which meet their basic needs, are generally also in conformity with the need to maintain soil fertility and water levels.

However, when new commercial crops are introduced rapidly without assessing their impact on food availability as well as soil and water conditions, then this can be a very disruptive experience. These days, due to a number of reasons, rural communities are under pressure to earn some extra cash. Hence, they may agree to any offer which brings a lump sum payment, regardless of its long-term impact. But after some time, the harmful impacts on food security and ecology far outweigh the small cash gains.

Such a situation can be seen in the Kotra block of Udaipur district (Rajasthan) following the introduction of Bt cotton crop and its rapid spread for some time. Babu Lal and his wife Mirdi Bai have been traditionally cultivating wheat, maize and *bajra* (a millet), on their farmland in Palesar village (Kotra block of Udaipur district, Rajasthan). This provided food for several months in a year for the 10-member family, apart from providing fodder for farm and dairy animals, all essential components of this mixed farming system.

However, some time back, agents of some companies started coming to their family and luring them with the promise of a lump sum payment. They finally convinced Babu Lal to plant and produce Bt cotton seeds in two of his fields.

Babu Lal soon found that he had to spend a lot of money on chemical fertilisers and pesticides for this seed production. He got several cans of highly poisonous pesticides. His entire family including children worked hard to produce Bt cotton seeds, bearing somehow the ill effects of the poisons they had to handle repeatedly now, all in the hope of getting the promised lumpsum payment.

When the time for payment came, however, the agent informed Babu Lal that the seeds produced in his farm had been declared to have 'failed' in tests and so he won't be getting any payment. Babu Lal and his family now faced economic ruin. The food harvest was much lower than normal, as the best fields and most labour and resources had been devoted to Bt cotton. Also, there was hardly any fodder. So Babu Lal had no other option but to borrow from private moneylenders at a high interest rate to meet the immediate needs of food and fodder. The family then had to work extra hard on the fields of others to pay back their loan.

This was not the end of Babu Lal's cup of woes. Not satisfied with holding back his payment, the company's agent started harassing Babu Lal for a payment of about ₹10,000 in lieu of the fertilisers and pesticides/weedicides etc., provided to him earlier. Till the time of this writer's visit to Palesar village on April 29, this harassment was continuing.

Babu Lal and Mirdi Bai say that they'll never again fall into the trap of deceit and deception set by the Bt cotton seed agents. This is also the view of several other tribal farmers of Kotra block who have tried their hand at Bt cotton seed production. This is evident from the fact that the number of such Bt cotton seed producers has fallen significantly during the last one year.

This trend started about five years back and reached its peak about three years back. But recently there has been a downward trend due to experiences of farmers like Babu Lal. Yet, there are farmers who continue to try their hand at Bt cotton seed production.

There is a clear need for introspection regarding the rapid changes introduced in tribal farming by agents of Bt seed companies. There is growing evidence that this has disrupted food security apart from introducing many health hazards and ecological threats, short-term as well as long-term. ■



Discover Pluto



THE secrets of the universe continue to fascinate mankind. Space agencies of countries like USA and Russia have sent numerous exploratory probes into space seeking to understand the making of the universe. On January 19, 2006, NASA launched New Horizons, the first and so far, the only probe to explore Pluto, its moons and the Kuiper belt. New Horizons set a record as soon as it was launched – it zoomed into space at 16.26 km/sec –the highest launch speed of a man-made object from Earth. It reached Jupiter in February 2007. Not only did it take photographs of the gas giant, but more importantly, it received a gravity assist

which increased its speed and shortened its journey to Pluto by three years.

After almost a decade after its launch, the probe made history by conducting the first-ever flyby of Pluto on July 14. It also studied its moon, Charon. The probe is now on its way to the Kuiper belt, a zone beyond the orbit of Neptune. The belt contains many small celestial bodies composed mainly of methane, ammonia and water. Astronomers regard the Kuiper Belt as an archaeological goldmine containing crucial information about planetary formation.

Findings

The primary mission of the New Horizons team led by the principal investigator, Alan Stern, is to closely study Pluto and Charon. It aims to map the surface composition and temperatures and study the geology and morphology of the two celestial bodies. The team also hopes to similarly study Kuiper Belt objects.

New Horizons has taken spectacular high-resolution photographs of Pluto and made some exciting discoveries:

- Pluto is bigger than previously thought. It is 1,473 miles (2370.56 km) in diameter.
- It is enveloped by a hazy halo.

- Photographs reveal a lightheart-shaped region named Tombaugh Regio after Pluto's discoverer.
- Scientists believe that the presence of methane in Pluto's atmosphere is the reason behind its reddish appearance.
- The images reveal ice made of nitrogen, carbon monoxide and methane flowing like glaciers on Earth.
- There is a range of relatively newly-formed mountains as tall as 3,500m in the region near Pluto's equator.
- The probe also captured the first clear images of two of Pluto's smaller moons, Nix and Hydra.

News in Numbers

New Horizons reached Pluto after travelling for 3,462 days and covering a distance of over 3.6 billion miles. It came within 12,500 km of Pluto. It is currently travelling at a speed of 14.52 km/s.

Radio signals from New Horizons take four and a half hours to reach Earth. That means it will need 16 months to transmit all the data.

The probe has 30-kg payload consisting of seven instruments including a telescopic camera and spectrometers.



DESI DIARY

Valley of Flowers

Come September, the Kaas plateau, Maharashtra's very own 'Valley of Flowers' explodes into a riot of colours with countless wild flowers blooming on the plateau and along the hill slopes.

The plateau, 27km from Satara, has a unique topography. Nestled in the Sahyadri hills, the region with laterite soil is colourful only for a couple of months in late monsoon. Thereafter the land becomes completely barren. But when Kaas is in full bloom, Mother Nature is at her best. Amazingly, it wears a different colour every week with the variety of flowers in bloom changing week to week. The sunny yellow of Smithia and Sonki flowers, the purple Karvi blooms, the pink expanse of balsam — the magical carpet is a sight for sore eyes. The colourful spread is sometimes covered by a layer of mist and one has to carefully follow the trails to avoid trampling on the tiny flowers.

Kaas boasts of more than 300 varieties of wild flowers, herbs, orchids, shrubs and also some rare species of insectivorous flowers.

To preserve this natural treasure the forest department has now restricted the number of tourists to 2000 per day.

Kaas is one of the 39 sites in the Western Ghats that was declared a UNESCO World Heritage Site in July 2012.



STORY

Hira's Great Escape



HIRA lived at the foot of the hill on which the Raigad fort stood. She delivered milk to the fort every morning and evening. One day, she lingered to watch the colourful Kojagiri festival being celebrated. Suddenly, a gong sounded and guards began to close the massive fort gates. "Stop!" shouted Hira, rushing towards the gates. But it was too late. The gates had closed and the soldiers refused to open them.

"I must return home to my child," pleaded Hira. "He and his grandmother are waiting

for me!"

"Once closed, the gates are not to be opened — these are Shivaji Maharaja's orders," the guards replied. "Stay inside the fort tonight with some family." But Hira was determined to go home. She began to walk along the high walls, which had now become her prison. She stopped at the eastern wall. It seemed possible to scale it. Leaving her pot behind, she clambered to the top. Below her, the hill fell away in one dizzying drop.

But all she saw were the lights of her village and her child waiting for her there. She climbed down the wall and down the steep slope, slipping, sliding some distance, losing one handhold but quickly finding another, till at last she was at the foot of the hill. Without pausing for breath, Hira ran home to her child. Shivaji later built a watchtower to guard the eastern wall, which Hira's feat had proved was vulnerable. He named the tower after Hira and it stands to this day.

THINK IT OUT

How many nails?



A carpenter has to fix an advertisement measuring 100 cmx100 cm on to a wooden board. He fixes nails all along the edges in such a way that there are 27 nails on each side and all the nails are equidistant to each other. How many nails does he use in all?

Answer: 104 nails. The four corners of the square display have one nail each. Each side of the square now requires 25 nails (excluding the four corners). Thus, total number of nails used = $4 + (4 \times 25) = 104$.

K.P.P. NAMBIAR

A visionary technocrat (1929-2015)

KUNNATH Puthiyaveetil Padmanabhan Nambiar, known as K.P.P. Nambiar, who passed away recently, was one of India's finest technocrats who made significant contributions in the field of industrial development and technology. He founded and nurtured many institutions, and the Government of India recognised his contribution by awarding him a Padma Bhushan in the year 2006.

Nambiar graduated in Physics from the Imperial College of Science & Technology, University of London, and one of his earliest assignments was with the Texas Instruments in the U.S. Heeding a clarion call from the then Prime Minister Jawaharlal Nehru to Indian technocrats working abroad to return to India, Nambiar relocated to India. Here, he joined the Council for Scientific and Industrial Research (CSIR) and thereafter, the Bharat Electronics Ltd., where as part of the Crystals Division, he was responsible for the introduction of the first communication crystals facility in the country. His technological expertise attracted attention and he joined the private sector Tata Electric as the General Manager of NELCO.

At Tata Power Company, Nambiar set up the Industrial Electronics Research and Development Lab. Nambiar then accepted an invitation from the government of his home state Kerala, shrugging off reservations of Doubting Thomases who felt that he was making a mistake in leaving Tatas, the corporate giant. Nambiar took office as the first Chairman of the Kerala State Electronics Development Corporation (KELTRON), an electronics manufacturing firm. He was instrumental in bringing Kannur city into the limelight as one of the premier centres for electronics development, and soon the Keltron story was replicated elsewhere with great success. He also pioneered the setting up of women's cooperatives to manufacture consumer durables under the Keltron brand and this provided employment opportunities

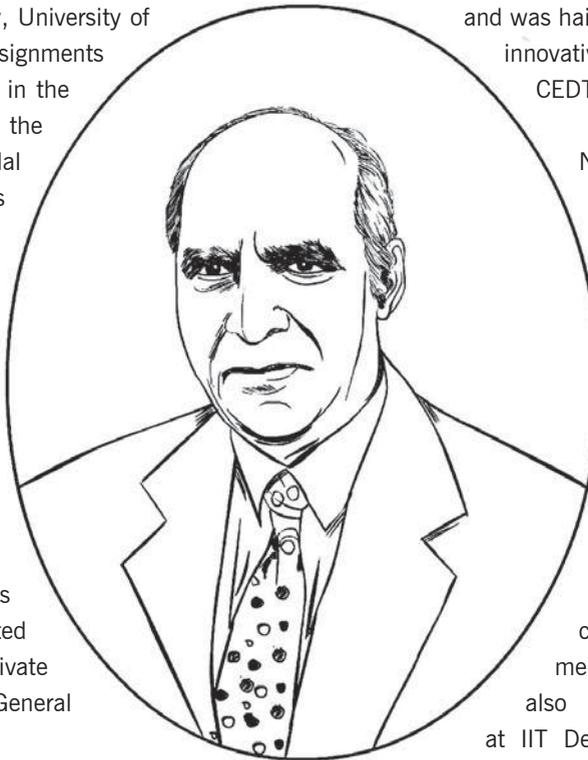
to hundreds of housewives and enabled many of them from the lower income bracket to earn a living. In 1985, Prime Minister Indira Gandhi handpicked him to head the state owned Indian Telephone Industries Ltd., as its Chairman and Managing Director and just a year later, Rajiv Gandhi who took over as Prime Minister after the assassination of Indira Gandhi, appointed him as the Secretary, Department of Electronics, GOI (Govt.of India). During his stint at the Department of Electronics, Nambiar won encomiums and was hailed as the architect behind several innovative initiatives like C-DAT, STPI, CEDTI and VLSI.

After his retirement in 1989, Nambiar moved on to fresh pastures and more assignments the earliest of which was his appointment as a Honorary Special Advisor to the Government of Kerala, where he was involved in the drawing up of a blueprint for a Techno Park in Trivandrum. This Park today serves as a hub for all the IT institutions operating in and around Kerala.

Never one to rest on his laurels, the renowned technocrat continued to serve as an industry mentor and institution builder and also took on teaching assignments at IIT Delhi in the Electrical Engineering department.

He also served as the Chairman of the Board at Indian Institute of Management, Kozhikode. Nambiar remained active almost till 2002 when he suffered a stroke. Acknowledged by the industry as a man with the Midas touch, Nambiar was the recipient of a number of honours and awards. Nambiar will be remembered as one of the stalwarts of the electronic technology movement in the country and as one whose brilliance in the field touched every single institution of which he was a part. His protégés have inherited his mantle and now occupy pivotal positions in several institutions spread across the length and breadth of the country. ■

– C. V. Aravind is a freelance Bangalore-based freelance journalist.



S. V. RAJU

Pragmatic patriot (1933-2015)

S. V. RAJU was born on 24 September 1933, in Mumbai. His mother passed away when he was four years old. Seeing the ill-treatment meted out to him by his stepmother, Raju's grandfather entrusted his upbringing to his uncle in Matunga, Mumbai. The trauma of his difficult childhood did not make him cynical. Nor did he have any ambition to be successful in the traditional sense of money and material comforts. He studied at Don Bosco School, Matunga, and passed his M.A. in political science from Khalsa College, Matunga.

His first job was with Garlick and Co. at ₹ 15 per month. His next job was with a labour relations organisation of a relative. At this time, he fell ill and was admitted to KEM Hospital where he met his future wife, a nurse, whom he married in 1961. The marriage between this Tamil Brahmin and the Protestant Christian was a great success, and it provided him a stable security net. Raju remained a Hindu, but shunned all rituals.

While working in the labour relations company, he came in touch with Minoo Masani who took him in as Executive Secretary of the Swatantra Party in 1959. Raju held this post for 14 years. The Swatantra Party formed a coalition government in Orissa in 1969. During his visits to Orissa, Raju used his own transport. He was a political rishi and did not use any government facilities. He was only 26 years old then and came in contact with outstanding intellectuals like Rajaji, Narayan Dandekar, Sir Homy Mody, V. P. Menon and N.G. Ranga. Association with these people had a tremendous influence on him, and yet he never dropped names. Six months before his death, Rajaji told him "I want you to keep the leaders together because I am afraid that they all want to go away". His prediction came true and the Party collapsed.

He continued to work in Masani's management consultancy firm of Personal and Productive Services (PPS). Even after the collapse of the Swatantra Party, he kept the Mumbai unit alive and also looked after other organisations

like the Indian Committee of Cultural Freedom (ICCF), Adult Education Institute, and edited *Freedom First* magazine with Geeta Doctor. He wrote a number of books including the biographies of Masani, M.R. Pai and D.N. Patodia. Raju was committed to liberalism and national security. He was pragmatic and did not support the activists and some NGOs who pushed the requirements of individual freedom to extreme limits. In 1980, Swatantra Bharat Party was launched in collaboration with Shetkari Sanghatana of Maharashtra. The

Election Commission had made commitment to "socialism and secularism" a condition for registration of a political party. Raju had

no difficulty about secularism, but was committed to free enterprise. There are many parties who paid the lip service of making a commitment and not follow these guidelines. Raju instead, challenged the constitutional validity of such ruling. It was not like him to make a pledge and act against it. The petition is still pending in the Mumbai High Court.

He worked tirelessly, delivering lectures on human relations at SIES College, Sion, organising seminars on diverse subjects like national security, education, agriculture and freedom of the press. It was due to his perseverance that recommendations of a study group resulted in waiving off of farmers' debts to

the tune of ₹ 65,000 crores in 2008. The Indian Liberal Group was revived with 3000 members. Some of the members wanted to resign due to lack of funds and Raju told them, "You can leave the organisation only on death since you are life members". A firm believer in the freedom of the press, he gave equal space for diverse and contradictory views in the *Freedom First* magazine. He passed away on 19 May 2015 leaving a void in the fight for individual freedom. He was a lone warrior in the effort to keep the flag of free enterprise and liberal policies flying. He led a simple life, and as per his wishes, no rituals were observed on his death. ■



– Brigadier Suresh Chandra Sharma (retd.)

PRAFUL BIDWAI

Passionate activist and journalist (1949-2015)

When news reached India that Praful Bidwai had passed away in Amsterdam on 23 June 2015, where he was participating in a conference, there was a palpable sense of disbelief. Journalists, peace activists, academics, scientists and environmentalists could not believe that the prolific, passionate, quintessential journalist-activist was no longer going to be around - to harangue, cajole, argue, convince readers, listeners and sceptics that nuclear disarmament was the only way ahead for the human race. No subject that concerned human rights, politics, social justice, environment and international peace escaped his interest and researcher's intellect.

His writings spanned four decades and appeared in the Economic & Political Weekly, Business India, Financial Express, the Times of India, Hindustan Times and Frontline. He also wrote for the Guardian (London), Le Monde Diplomatique I (Paris) and II Manifesto (Rome), apart from a host of lesser known publications. He was a Marxist and a shining light of that very small tribe in India - a public intellectual who was unafraid to speak his mind and write what he believed was the truth. Not everybody, certainly not the powers that be, agreed with him, but his refreshing frankness and fearlessness in going against popular opinion won him a legion of admirers all over the world.

He was a critic of India's nuclear weapons strategy and the Coalition for Nuclear Disarmament and Peace (CNDP) which he co-founded, did yeoman work in this regard. He never tired of attempting to convince cynical power brokers and nuclear armament supporters of the danger and futility of their ways.

Bidwai was a passionate lover of classical music and a trained singer. Not surprisingly, he had tremendous knowledge of classical Indian music and attended not just concerts but took every opportunity to "educate" his friends.

Had he wished he could have had a lucrative career in the corporate world. Born in Dewas in Madhya Pradesh, of a family that originally hailed from Maharashtra, he joined IIT (Indian Institute of Technology), Bombay, for a course in

electrical engineering in 1966. There he was influenced by progressive and left leaning teachers and senior students, who were in turn influenced by civil rights and progressive movements in the United States, Latin America, Africa and Europe. Their subjects of protest were apartheid and racism, Zionism, militarism, imperialism and all the other issues that they flagged as oppressive and exploitative. Bidwai began working with Dalit youth and workers in the city's poorer areas and then took the momentous decision to leave IIT mid-way. He began working with a group in Dhule district (Maharashtra) among the adivasis there, who faced horrendous exploitation.

From there on, his life encompassed all issues of social justice and human rights. He was a part of almost all movements that worked for these issues and garnered fame also as a journalist.

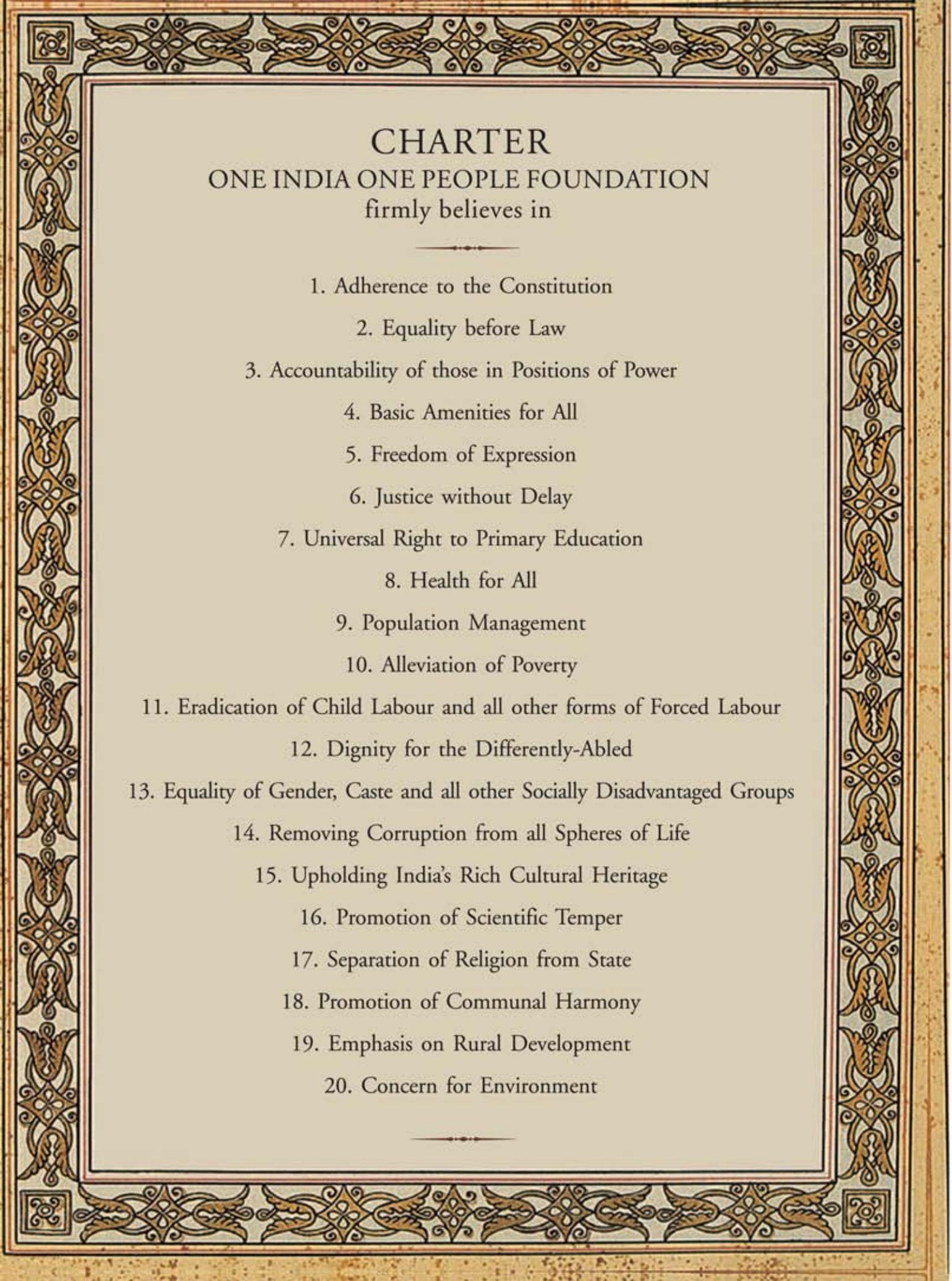
The Bhopal gas disaster, the Narmada Bachao Andolan, and many other events and issues were grist to his mill. He wrote forcefully, but only after tedious research, interviews and careful marshalling of his arguments. While many of his articles/books would be considered worthy of praise and study, his article in Business India in 1978 is considered a landmark in Indian journalism. It was a lucid exposition of nuclear reactors in the country, and what they did not just to the environment, but also to their employees.

Nothing can be a greater tribute to an intellectual than appreciation by people at the grassroots. Aruna Roy of the Mazdoor Kisan Shakti Sanghathan (MKSS) said "In Praful Bidwai's passing away, India's poor and marginalised citizens, and the earth's fragile and beleaguered environment have lost a compassionate, fearless, and powerful voice of reason. Praful was at his best when he faced the most powerful and seemingly indomitable opposition".

Till the end, he continued to write and speak and discuss and argue on these subjects that are connected to the fate of the human race. His death has diminished us all. ■



(Sketches of Great Indians by C.D. Rane)



CHARTER
ONE INDIA ONE PEOPLE FOUNDATION
firmly believes in

1. Adherence to the Constitution
 2. Equality before Law
 3. Accountability of those in Positions of Power
 4. Basic Amenities for All
 5. Freedom of Expression
 6. Justice without Delay
 7. Universal Right to Primary Education
 8. Health for All
 9. Population Management
 10. Alleviation of Poverty
 11. Eradication of Child Labour and all other forms of Forced Labour
 12. Dignity for the Differently-Abled
 13. Equality of Gender, Caste and all other Socially Disadvantaged Groups
 14. Removing Corruption from all Spheres of Life
 15. Upholding India's Rich Cultural Heritage
 16. Promotion of Scientific Temper
 17. Separation of Religion from State
 18. Promotion of Communal Harmony
 19. Emphasis on Rural Development
 20. Concern for Environment
-

WHO AM I?

Am I a Hindu first or an Indian first?

Am I a Muslim first or an Indian first?

Am I a Christian first or an Indian first?

Am I a Buddhist first or an Indian first?

Am I a Brahmin first or an Indian first?

Am I a Dalit first or an Indian first?

Am I a South Indian first or an Indian first?

Am I a North Indian first or an Indian first?

Am I the President of India first or an Indian first?

Am I the Prime Minister of India first or an Indian first?

Am I the Commander-in-Chief first or an Indian first?

Am I a supporter of any 'ism' first or an Indian first?

Am I a white-collar/blue collar worker first or an Indian first?

Am I a youth/senior citizen first or an Indian first?

*In all cases you are Indian First, Last and Always.
Be a Proud Indian. Make this country Great, Strong and United.*



Sadanand A. Shetty, Founder Editor

(October 9th, 1930 – February 23rd, 2007)

ONE INDIA ONE PEOPLE