

Challenging 'accepted' theories

Theoretical constructs that were written off as impossible can exist



QUANTUM LEAP

DEVANGSHU DATTA

One of the cardinal rules of science is that every hypothesis is open to experimental testing, and to being discarded or radically modified upon contradictory results. Sometimes a theory is accepted for centuries. For example, Newton's Laws were accepted until Einstein came along, 250 years later.

Some things go unchallenged for so long that it is a shock to learn that they require modification. Mass and absolute zero are two things that every

school child is taught to be intrinsic: Every object has mass; atoms stop moving at absolute zero.

Both notions have been challenged in the recent past and now, two-dimensional (2D) magnets, strange objects which were considered only theoretically possible, have been also been discovered. A few years ago, scientists at the University of Munich and the Max Planck Institut cooperated to demonstrate that it was possible under certain circumstances to induce "negative temperatures" of below absolute zero. The details are available at <http://science.sciencemag.org/content/339/6115/52>.

Some weeks ago, *Nature* magazine published an article, available at <http://www.nature.com/nature/journal/v546/n7657/full/nature22391.html>, describing 2D magnetic effects in a single atomic layer. This study was lead-authored by Xiaodong Xu and Pablo Jarillo-Herrero of the University of Washington, Seattle, and the Massachusetts Institute of Technology, respectively.

Magnetism occurs when electrons spin while aligned in the same direction. Metals display magnetic properties in 3D — in fact, it is considered a property that defines metals. But that magnetism usually disappears when the metal is cut into super-thin 2D mono-layers. Previous experiments have tried to retain magnetic properties at 2D levels by introducing holes and bumps in 2D layer.

This study describes how a compound, chromium tri-iodide (CrI₃), retains magnetic properties at 2D levels without such distortions. CrI₃ can be reduced to 2D by using scotch tape — literally pulling off layers using adhesive tape. That's a technique first used to isolate the wonder-material, graphene, and it helped win a Nobel Prize.

Once down to a one-atom-thick slice of CrI₃, the researchers tested its magnetic properties by shining a beam of polarised light. If electrons are spinning in alignment, the reflection of a polarised beam is characteristic. This

was visible at the mono-layer. Interestingly, the magnetic property disappears when two mono-layers are used — the two layers must have electrons spinning in opposed alignments. If three mono-layers are used, magnetism returns. Magnetic properties are essential for modern forms of information storage and that's one of many implications. Other strange properties could come to light if ultrathin layers are combined in other ways.

Negative mass is considered an even stranger concept. We know that electricity has negative and positive charges. What happens if mass has a negative charge? If you push something with positive mass, it moves away. If you push an object with negative mass it comes towards you.

In gravitational terms, two bodies attract each other with a force proportional to the product of their masses and inversely proportional to the distance between their centres. By Newton's Law, an object with negative mass should float away from an object with positive mass.

The mathematical and physical implications get really strange when we consider black holes — what happens to negative mass near such phenomena? In 1914, Saoussen Mbarek

and Manu Paranjape, at the Université de Montréal in Canada, wrote a paper hypothesising that negative mass was possible without violation of the laws of physics as we know them.

Led by Peter Engels, a team of Washington State University physicists claim to have created a fluid with negative mass, which has some strange properties. They have published their findings in *Physical Review Letters* <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.118.155301>.

The team cooled rubidium atoms to near absolute zero, using lasers to slow down atomic movements. This created a Bose-Einstein condensate, a state of matter where particles move very slowly and behave like waves. Superfluidity arises, with the condensate flowing without energy loss.

Now the condensate was hit by a second set of lasers that changed the spins. This changed the condensate into negative mass. It exhibits some of the peculiar properties negative mass objects are supposed to have. The experiments will continue and presumably more data will be generated. The implications are foundational. This confirms that theoretical constructs that were written off as physically impossible can actually exist.

CHINESE WHISPERS

Victory of women power

Of the leaders of the 17 Opposition parties that gathered on Thursday to discuss the name of their Presidential candidate, Bahujan Samaj Party and Trinamool Congress leaders stressed that their respective party chiefs have been in the forefront of proposing and supporting former Lok Sabha speaker Meira Kumar's name. While BSP's Satish Chandra Mishra spoke about his party chief Mayawati's support for Kumar, it was Trinamool Congress' Derek O'Brien who stole the show. O'Brien first spoke at length about West Bengal Chief Minister, and party chief, Mamata Banerjee's recent visit to The Hague. O'Brien then said how three women have led the way in supporting the candidature of another woman. He said Congress president Sonia Gandhi, whose party has the largest number of votes in the Presidential electoral college among the Opposition ranks, followed by Banerjee, with the second largest number of votes, and finally BSP chief Mayawati have come together to pick Kumar. O'Brien said the result of the Presidential election notwithstanding, it was the victory of women power.

Raja's dilemma

Among the possible contenders for the common Opposition candidate, some had also talked about Communist Party of India Rajya Sabha member D Raja. At the meeting of the Opposition parties on Thursday, Raja's name didn't come up but there were many who remembered that media had talked about him as a contender and pulled his leg. When the Opposition leaders started signing nomination papers of their candidate Meira Kumar, one of the leaders asked Raja not to put his signature. "You would be out of the race if you sign this," the leader told Raja. Another quipped how Raja could still be the Vice-Presidential candidate of the Opposition. Another said he shuddered at the thought, since neither he nor other members would get time to speak given Raja's penchant to deliver long speeches. The Vice-President is also the Chairman of the Rajya Sabha and conducts the House when Parliament is in session.



ILLUSTRATION: RAVI RANA

A protest through Twitter

Social media is emerging as the go-to platform to protest imposition of Hindi in Karnataka. For the last year or so, people have raised their voice against replacing Kannada with Devanagari script in bank challans, rail tickets, and metro tickets. Now, a BJP parliamentarian has joined the chorus. Protesting against a milestone in Channapatna, a tourist spot famous for wooden toys, BJP MP from Mysuru and Kodagu, Pratap Simha, on Thursday urged Union Transport Minister Nitin Gadkari to stop "imposing" Hindi in the state. "Sir @nitin_gadkari, which language is this? Literacy rate of Karnataka is 75.35 per cent. Nearly 25 per cent can't even read Kannada."

Russia & India: Reading between the lines

The officialese does not reveal why India plays a weaker hand with Russia than China



ANITA INDER SINGH

which was signed as the US used military-ruled Pakistan as the gateway to establishing diplomatic ties with Mao's China. Pakistan was then committing genocide in East Pakistan — which, with Indian intervention, eventually became Bangladesh. In 1993, post-Soviet Russia and India confirmed their constructively peaceful tie in the Treaty of Peace, Friendship and Cooperation, and in 2000, in their Declaration on Strategic Partnership.

Currently, the apparent agreement on international relations conceals much. The Statement hails a 'multipolar global order in international relations'. As members of BRICS, its New Development Bank and the China-led Asian Infrastructure Investment Bank, Russia and India do challenge the western-led economic order. But BRICS is stymied by Sino-Indian tensions. Moreover, a 'multi-polar global order' implies international recognition of China's growing economic and military clout. Does India really want this?

More worrying are Russia's closer ties with China and Pakistan — two all-weather friends who claim parts of Indian territory. India sees their ties with Russia through the lens of its bilateral disputes with China and Pakistan; Russia views them through its global lens



DIVERGENT VIEW Prime Minister Narendra Modi and Russian President Vladimir Putin at the St Petersburg Economic Forum on June 1. India sees its ties with Russia through the lens of its bilateral disputes with China and Pakistan; Russia views them through its global lens

PHOTO: REUTERS

global community to respond 'without double standards and selectivity.' But Moscow fears that fighting in northern Afghanistan could spill over into its Central Asian back garden, and that ISIS militants could threaten the security of that region and southern Russia. Wanting ISIS militants in Af-Pak to be crushed, Moscow sees its security interests 'objectively' coinciding with those of the Taliban over their common enemy, ISIS, and best safeguarded through dialogue with the Taliban and their Pakistani mentors.

As for trade, Russia welcomes more Indian investment in Central Asia, and an free-trade agreement (FTA) between the Eurasian Economic Union (EEU) and India is to be discussed. India faces stiff competition from China. India's trade volume with Kazakhstan,

Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan combined is less than \$1 billion: China's is \$50 billion and Russia's \$30 billion. Unlike Russia and China, India does not neighbour any Central Asian country, and has no direct transport links with the region. The Russia-China summit in March 2015 proposed the linking of the Russia-led EEU with China's One Belt, One Road (OBOR). A preliminary agreement between the EEU and China could be signed in 2018 as the first step towards the potential creation of a free trade area.

India hopes that the International North-South Transport Corridor (INSTC) — initial members were Russia, India and Iran — could promote its connectivity, bilateral and regional cooperation with Central and West Asia. The INSTC could reduce the journey between

Mumbai and St Petersburg from 40 days to 20 days. But even if the corridor is completed, as intended this year, its users will face a Byzantine maze of rules in the different countries that will join it.

Significantly, Russia does not view the INSTC as a counter to China's OBOR.

Indeed, India must contend with Russia's endorsement of China's OBOR which puts the historical and contemporary spotlight on Central Asia. Last month, Putin himself attended the OBOR conference in Beijing, which India boycotted. Meeting Xi Jinping on the sidelines at the SCO meeting in Astana, Putin reiterated that OBOR had won extensive international support.

What will India actually offer Russia? Here, too, India must contend with competition from China. Current Russia-India trade stands at \$7.8 billion — down from \$10 billion in 2014. The two countries hope to raise it to \$30 billion over the next five years. Trade between China and Russia jumped 26.2 per cent year-on-year to \$24.7 billion in the first four months of 2017.

Russia welcomes Indian investment in its Far Eastern region. But China and Russia are already planning to set up a joint regional investment fund with a total amount of 100 billion Yuan (around \$14.5 billion) to bolster the development of Russia's Far East and Northeast China.

Russia, like China, will use the SCO prioritise its own Asian interests; perhaps increase cooperation with China (and maybe Pakistan) to advance them.

Changing priorities define the new Russia-India tie.

The author is a visiting professor at the Centre for Peace and Conflict Resolution, New Delhi

BUSINESS LIFE

Tough task ahead for next Uber leader

Making amends with the global network of over 2 mn drivers is paramount

KEVIN ROOSE

The huge, headline-grabbing news out of Uber this week was the resignation of its chief executive, Travis Kalanick, under pressure from the company's board, a stunning move that capped a months-long crisis, involving sexual harassment, executive misbehaviour and Uber's hard-nosed culture.

But amid the drama leading up to Kalanick's forced departure, Uber made a quieter change that could represent another momentous shift for the company. On Tuesday, the company announced that passengers would soon be able to tip their drivers through the Uber app.

The change, which Uber plans to roll out nationwide next month, is a sudden reversal of long-standing company policy, and a move Uber fiercely resisted for years.

Under Kalanick, the company argued that giving riders the ability to tip drivers would create "friction" in an otherwise seamless transaction and lead to awkward interactions between riders and drivers. The company even cited a 2008 Cornell University study that found that consumers tipped black employees less generously than white employees, and suggested that adding in-app tipping would lead to racial discrimination.

The relationship between Kalanick and Uber's global network of more than two million drivers has always been strained, to put it mildly. Drivers, who are not technically Uber employees but whose income depends largely on Uber's policies and pricing structures, balked at Kalanick's seeming indifference to their needs. At times, Kalanick sounded openly hostile to his company's labour pool, musing in



Under Travis Kalanick, the company argued that giving riders the ability to tip drivers would create "friction"

PHOTO: REUTERS

onstage interviews about how long it would take to replace them with self-driving cars.

"There are a lot of things about Uber that tip the balance to the passenger side," said Harry Campbell, a Los Angeles-based Uber driver and founder of TheRideshareGuy, a resource site for drivers. "A lot of that seemed, rightly or wrongly, to stem from Travis, and a lot of drivers blamed him for that."

Tipping was among the hottest flash points. Uber drivers argued that they were missing out on thousands of dollars in potential earnings by not being able to receive tips inside the app. (Riders could give Uber drivers tips in cash, but few did.) Earlier this year, the Independent Drivers Guild, a group representing Uber drivers in New York City, collected more than 11,000 signatures on a petition calling for an in-app tip jar.

Then there was the video. In February, a dashboard clip of Kalanick

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LETTERS

Political crystallisation

The Presidential poll has lent more colour to the kaleidoscopic Indian politics. We have now become conscious that parties that are not constituents of the NDA are not opposed to the BJP, and cannot be counted as part of the wider Opposition in any meaningful sense.

In fact, parties such as the AIADMK, BJD, TRS and YSR Congress are clearly closer to the BJP than the Congress and the Left. The way these parties have rushed to extend their support to the NDA choice for presidency, Ram Nath Kovind (pictured), has conveyed their endorsement of Narendra Modi's three-year rule.

The Presidential poll has given greater visibility to the uneasy relationship between the JD(U) and the RJD in Bihar. Nitish Kumar has sent signals that he is gravitating towards the BJP. His support to the NDA candidate has shrunk the space for him to emerge as the consensus choice of the Opposition to challenge Modi in 2019.

A lot is spoken of Ram Nath Kovind's Dalit identity. But less is said about what actually won him his elevation to the presidency: his unwavering loyalty to the Hindutva cause. The Congress and the Left certainly have a point when they say that the Presidential election has brought to the fore the battle between two ideologies — one represented by them and the other by the BJP. The numbers are stacked in NDA's favour; but then the battle for the soul of India cannot be lost.

G David Milton Maruthancode

Limiting innovation

In his column, "The paradox of innovation" (June 22), Shyamal Majumdar brilliantly concludes that India has far to go in the field of innovation, in spite of its jump from the 81st ranking in 2015 to 60th in 2017.

The biggest hurdle in innovation is our national culture, made worse by our education system. We are tradition lov-



ing, status quoist people, with a high sense of obedience towards established order. The best age for nurturing creativity is through primary education.

The rote system of teaching kills that spirit early. Consequently, that skill comes from an instinct or self-learning, so the number of innovative persons is bound to be minuscule.

Indian universities do not have a culture of research since the faculty is engaged in a mix of academic and non-academic activities and teaching is not the first choice of top talent in the country. Also, in a culture where the purpose of education is equated with a well-paying job, young people find no attraction in a research-based career.

Furthermore, Indian business houses don't see much need for new ideas as benchmarking and buying second-rate technology serves their purpose. As long as GE's 360-degree method of performance

appraisal, or Toyota's just-in-time serves the purpose, why spend on research?

Y G Chouksey Pune

Creature of politics

The NDA's Presidential candidate and the justifications for his nominations, along with the statements in media, have boiled down to this: Unless you are a Dalit, Muslim, or a minority, don't dream of becoming a President in the near future.

It is time, becoming a President had only one eligibility criterion — the candidate should never have been a member of any political party, or any legislature, even as an independent candidate. Unless this is done, we won't be able to undo the damage done to this high office by the Congress for the last 60 years and the BJP now, who has reduced the persona of the President to a ruling party's biggest silent election campaigner and banner.

So much for the touted statement that the President must be above politics, religion, caste, etc. The office has now turned into a creature of politics, religion, and casteism.

TR Ramaswami Mumbai

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HAMBONE



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Mr Modi's Trump card

Pursuing national interest is the safest bet

Narendra Modi's first meeting with Donald Trump on Monday has a low-key aura, principally because the maverick nature of the United States' 45th President has set the bar low in terms of expectations. Will Mr Modi be able to replicate the personal rapport he enjoyed with Barack Obama, reversing the deterioration of Indo-US relations in the last days of the United Progressive Alliance? Although they are deemed to have many things in common, Mr Trump's erratic policy stances — radically reversing some or depending on doubtful facts for others — add a serious element of uncertainty to India's negotiating position on a range of issues, from H1B visas to fighter aircraft, cross-border terrorism and climate change. The nomination of Kenneth Juster, a top White House economic advisor, signals that the administration does attach some significance to the Indian relationship. In the main, however, the signals from the new administration have been opaque.

The hardening position on H1B visas, which impacts Indian IT firms in a major way, and a factually incorrect accusation of India and China as irresponsible emitters that are seeking foreign aid to implement their climate change commitments point to challenges in the relationship. On the other hand, the Trump administration's tougher stance on Pakistan suggests opportunities for closer cooperation on cross-border terrorism. But a broader strategic framework of cooperation is likely to be elusive. Mr Trump's two known positions (as on date) is that he views foreign relations in transactional terms and job-creation remains his principal domestic preoccupation. Mr Modi has already successfully signalled his stance of pursuing neutral national interest in the multi-polar world that is emerging as a result of Mr Trump's America First agenda. On recent visits to the Europe and Russia, he conspicuously iterated India's intention of outstripping its climate commitments and signalled closer cooperation with Vladimir Putin on nuclear power technology.

Last week, the opening of a direct shipping line to Qatar to deliver relief supplies following the blockade by the US-allied Gulf Cooperation Council underlines this broad message. At the same time, plans for a joint Indo-US-Japan naval exercise off the coast of Malabar this year, slated as the biggest such initiative, implies closer military ties and the opportunity to play the role of balancing power against regional alignments that China is building through its One Belt One Road initiative. On the one point of convergence in their domestic agenda — employment — the road may be tricky and it is important for the prime minister to get Mr Trump listen to facts. For example, on H1B visas, on which some back-channel negotiations have been under way, it will fall on Mr Modi to explain to the president the job-enhancing potential in America of this much-maligned programme. Mr Trump is likely to push for F16 fighter jet purchases to get Lockheed Martin's Texas assembly line moving again, whereas Mr Modi's defence acquisition plans hinge on his signature Make in India programme. How the twain will meet remains a truly open question and may well come down to personal chemistry.

Gorkhaland blues

Cynical politics overwhelms serious economic issues

Considerable attention to the escalating unrest in Darjeeling has been focused on the cynical electoral machinations of the Bharatiya Janata Party (BJP) and Trinamool Congress. These tricks have been maximised by the Gorkha Janmukti Morcha (GJM), the dominant unit among the myriad local power players in this three-decade-old movement demanding a separate state called Gorkhaland. In the process, all the actors are ignoring the mounting economic crisis that is likely to fan the conflict in lasting ways. The May-end diktat imposing Bengali in school curricula — the proximate reason for this current outburst of popular protest — has been so ambiguously modified as to scarcely allay embedded fears of forced acculturation. The upcoming elections to the Gorkha Territorial Administration (GTA) — the semi-autonomous administrative body set up in 2012 for the region — is undoubtedly adding fuel to this simmering ethnic fire.

Ms Banerjee's aggressive promotion of her party with its overt Bengali identity has had the effect of uniting the hopelessly divided Gorkha movement against the state government. Now, her extreme reaction to the current protests — slapping criminal cases against critics, including school principals, calling out the army and jamming cellphone services — raises the spectre of a Kashmir-style crisis and suggests that her options are narrowing. The irony is that the BJP, too, finds itself in a bind. Having presided over the creation of three new states — Chhattisgarh, Jharkhand and Uttarakhand — its strategy of drawing on GJM help to win the region's sole Lok Sabha constituency in return for the promise of statehood has stymied its larger plan to bag West Bengal in 2019. Gorkhaland may resonate with a segment of the population that accounts for the majority in an area that covers one parliamentary seat and two Assembly constituencies, but it is unlikely to be popular among inhabitants in the plains of Bengal. Thus, even as prominent BJP spokespeople faithfully promised the formation of Gorkhaland, the issue was absent in the party's 2014 election manifesto. And the party's Bengal unit chief has roundly contradicted the Centre's stance.

No solution to festering ethnic resentments can be found in these calculations. If, however, Ms Banerjee sincerely seeks a lasting solution, it can be found in resolving the brewing crisis in the two principal employers in the region. The output of the Darjeeling tea industry, which reportedly accounts for direct employment of over 50,000 people and many more indirectly, has been declining for the past few decades. Today, 80-odd gardens remain from some 180 at the time of Independence and production since 1991 has halved, owing to declining soil health, ageing tea bushes, high costs and the inability to get good prices. Tourism, the other major earner, is closely related to tea. It has been growing, but chronically poor infrastructure and regulation have meant that its opportunities have not sufficiently compensated for the decline of the tea industry. Ms Banerjee would do better to focus her attention on tackling these issues rather than ramming through a cultural agenda that will benefit neither Bengal nor India.

ILLUSTRATION BY BINAY SINHA



Politics beyond the boundary

Instead of being surprised at Kashmiris celebrating a Pakistan win, Indians should introspect how they have been treating them

India's cricket team received its comeuppance in the Champions Trophy final. I was not in the country and missed the match, but I hear our captain's face appeared longer in the spots flogging deodorant and insurance between overs than the total time he spent at the crease. No matter: It's only a game. For those of us who see all Pakistanis as enemies, the defeat was a moment of catastrophe, but of course everyone will have moved on by now.

A few days before the match, as Pakistan was muscling its way to the final, a reporter called to ask me about a controversy regarding their captain's poor English. Apparently in his post match comments he spoke it without familiarity and with a thick accent, as an Urdu medium person might. Was it fair to judge him for his accent rather than his playing abilities, the reporter asked?

I'm no expert on the subject, but I have been a columnist long enough to be on the speed dial of journalists looking for a quick quote. I said it reflected very well on Pakistan that such individuals were picked and rose to captaincy. It showed an egalitarian system where people were selected on merit, not background.

It seems difficult to do in India, where the urban, upper class and upper caste man usually makes the team. Brahmin players such as Sunil Gavaskar, Dilip Vengsarkar, Sanjay Manjrekar, Sachin Tendulkar, Rahul Dravid, Saurav Ganguly, Jayagopal Srinath and Anil Kumble are easy to recall. Indians from underprivileged backgrounds who made it to the national team, leave alone

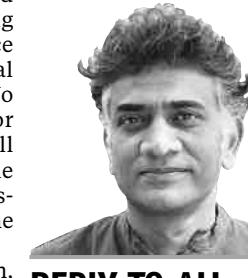
captain it, don't come easily to mind. Mr Gavaskar once observed how close the Dadar Union team, which he represented, was to the Indian national side. It cannot be that there were few talented and deserving Indians outside central Mumbai.

Today we think someone from Ranchi, even if anglicised and middle class (M S Dhoni), shows our team's inclusiveness. It doesn't. The Dalit Christian Yousuf Youhana, who later became Mohammad Yousuf, the son of a sweeper in Pakistan Railways, played 90 tests.

Of course Pakistan also has the occasional Oxbridge type, such as Imran Khan, but looking down the years at their team, it is fair to say that their players and captains, judging purely by the way they speak, come from more modest backgrounds than do ours. I wish India had won the match, as I always do, but I do not grudge success to men who have picked themselves up and made something of themselves despite their circumstances.

The other thing that the match, more specifically its aftermath, revealed was how totally brainwashed Indians have become when it comes to Kashmir. It angered many that Kashmiris celebrated Pakistan's win. I think this anger and surprise is essentially borne of two things. First, the success of our nationalist propaganda. It has managed to convince us that the problem in Kashmir is entirely the doing of Pakistan. Kashmiris love us, or are misguided, and if Pakistan were to stop its mischief they would fling themselves into our arms.

Why we need hundreds of thousands of sol-



REPLY TO ALL

AAKAR PATEL

How to buy career insurance

It's that time of the year when students scramble for college admissions. If you are a parent, whose child is going through the pangs of admission, as my wife and I are, it is hard to not allow the stress to get to you. And that's why you're likely to tune into war stories of other parents. And this year, my sense was that the biggest trepidations were reserved for engineering students.

Like this batchmate from school whose son wanted to study computer science. But with the information technology (IT) sector seemingly in dormancy, he wondered what to do. His engineering friends in his WhatsApp group weighed in with advice: Pursue any of the core engineering streams till the third year. And depending on the job market, decide on the area of specialisation. If machine learning, artificial intelligence (AI), the internet of things (IoT) or robotics are still the rage — or some entirely new speciality, pick one or two of those for special focus in the last year. And then hope and pray that the college placement service would do the rest.

Going through college admissions with an eye on the job market is a bit like Russian roulette. And every passing year, the situation gets worse. This year, with immigration laws being severely tightened in every market, including in the US, Australia, parts of Western Europe, UK, the prospects of studying and settling abroad have become infinitely tougher. Most international students now have very little option but to come back to their home base.

So will interesting, new jobs be easy to find in India? Your guess is as good as mine. Jobless growth is a phenomenon that we've all come to

accept. And to queer the pitch, it is getting harder and harder to predict which jobs will stay relevant. So I dialled a bunch of friends in IT and in

learning who know a thing or two about the future of skills, jobs and education sector. Based on those candid conversations, here are a few pointers for parents of young people. (I've attempted cut out the fancy jargon and keep it simple.)



STRATEGIC INTENT

INDRAJIT GUPTA

Stagnancy won't be tolerated anymore

First, the spectre of job losses in the IT sector. Yes, the IT industry is rebooting itself.

However, the extent of job losses haven't been anything

alarming. Mid-career people who've lost jobs in the large IT companies were those who refused to reskill themselves. They were comfortable doing what they had done for the last decade or so. And refused to learn new skills. Stagnancy may have been tolerated earlier, but with margins and growth slowing down, no IT company can hold on to such people. You can't afford to be a "glorified mail box", as someone told me, banking on just project management skills. You need real engineering and coding skills that are relevant. If you live in denial and refuse to move along, it will be the beginning of the end for your career.

Now, that can't be such a bad thing. Not just in IT, but in any industry.

DON'T WAIT FOR THINGS TO HAPPEN, MAKE THEM HAPPEN

Clients around the world are crying out for help. It could be a new competitor eating their lunch. Or a new technology that's suddenly upending old ways of working. From retail, banking, health care

to hospitality and renewable energy, change is everywhere. Most times, the change is so overwhelming that clients don't know what they need. And you've got to engage deeply to understand their business. And solve their problems. Sounds simple? Not quite. At least one Indian IT CEO that I know has cried himself hoarse about the need for his teams to be more proactive about problem solving. Don't wait for clients to tell you. Step in and figure out what needs to be done. And just do it. This is where rigor mortis sets in. If all you've done is to follow instructions all your life, it is unlikely that you'd be able to think for yourself. After all, you can't take charge of your client's destiny, if you don't have a perspective of where your own career is headed.

Having a problem solving mindset won't just be useful, it will be essential.

TECH MAY BE EXPANDING ITS TENTACLES, BUT HUMAN INGENUITY ISN'T GOING AWAY

While AI and automation will cut out mundane tasks, there will be always be need for human intelligence to add value and push the envelope. This came out loud and clear. And if tech changes are likely to become more and more ephemeral, how do you hope to stay relevant? That's why learnability is key.

And guess what? Age has very little to do with it. I know at least a handful of leaders in their fifties and sixties who are just as intellectually curious as they were when they were in their twenties. They read voraciously, love to seek out and soak in new learnings experiences and have no qualms about learning from young people.

I'm willing to bet that a learning mindset is your best insurance for the future.

The writer is co-founder at Founding Fuel, a learning platform aimed at a community of entrepreneurial leaders

Half-baked economics



BOOK REVIEW

SHREEKANT SAMBRANI

A confession: This reviewer is not especially fond of books with numerals in their titles or sub-titles. They remind him of either self-help books such as Steven Covey's *Seven Habits* or manuals such as Six-Sigma guides. Business travellers pick them up at airport bookshops in the hope of becoming more successful or better technocrats by the time they land at their destinations. Some exceptions, such as Alvin Toffler's *The Third Wave* or Ruchir Sharma's latest with a sub-title of "Ten Rules of Change in the Post-crisis World" are more serious and engage readers and

reviewers alike, albeit not uncritically.

Kate Raworth's first book with a numeric sub-title is more of an enigma. She is didactic but not a self-help guru or a technique trainer. She has been there and done that, including stints in Africa and Oxfam, with a detour to the United Nations to write sections of the Human Development Report, before settling down to teach and research what she calls 21st century economics in the ivied groves of academe. She has all the fine modern sensibilities about equality, ecological balance, environmental sustainability (most of which she believes classical or neo-classical economics lacks), which she proudly and justifiably wears on her sleeve.

She has been a student of economics but it is evident that the more she studied it, the more disenchanted she became with it. So when she found young people questioning the relevance of conventional economics in the wake of the 2008 crisis, she believed a revolution of sorts was

in the offing. She had been writing articles and presentations on these themes as also running a dedicated website. The time was ripe for compiling these thoughts into a volume.

At its essence, the economic universe of Ms Raworth is shaped like a doughnut (more on this later). In the inner hole are the basic needs such as food, shelter, water, health, education, gender-and-income-equality, among others. Existence in the annular space is balanced, but within the hole it is marked by shortfalls and that outside it is overshooting the resources.

Seven yardsticks are proposed to analyse the consequences of economic actions: Changing goals (not just the gross domestic product, but the doughnut); the big picture (not the self-contained market economy but society as a whole); nurturing (not just the rational individual but a socially adaptable one); savvy systems (not mechanical equilibrium but a dynamic one); distribution (not as a consequence but a design parameter); regeneration (again, not as a consequence but a design parameter); and, finally, growth

agnostic (not limitless).

Mr Raworth writes engagingly on each of these replete with anecdotal and major evidence, expressive graphics and draws on her own experiences to illustrate the various points. She admits that her optimistic vision of "a global economy that creates a thriving balance thanks to its distributive and regenerative design" may "seem foolish, even naïve" in our conflict- and crisis-ridden world. But she is confident that "there are enough people who will see the alternative, the glass-half-full future, and are intent on bringing it about. I count myself amongst them".

There are others as well. George Monbiot, a British political activist who offered a reward to people for a peaceful citizen's arrest of former British prime minister Tony Blair for alleged crimes against peace, wrote in *The Guardian*, "I see her as the John Maynard Keynes of the 21st century: By reframing the economy, she allows us to change our view of who we are, where we stand, and what we want to be." Surely, only ideological fellow-travellers would engage in such

hyperbole, because the book has not exactly set the Thames or the Cam on fire since its publication.

Ms Raworth writes with a proselytiser's zeal on her research which "is focused on exploring what planetary and social boundaries imply for rethinking the concept of economic development", so one is not surprised that issues are presented in the binary of good versus bad. But that process sometimes entails setting up straw demons and slaying them. Few mainstream economists have ever espoused the growth-at-any-cost and devil take the exploitation angle even in earlier eras and certainly not now. The Masters of the Universe who engineered the subprime crisis, the fictional Gordon Geckos and the real Jordan Belfort, are on no one's list of economists. And there are many distinguished ones, including Nobel Laureates (not among Ms Raworth's favourites) who have pioneered thinking on the commons, distributional justice and sustainable development.

Economics is not just a positive discipline but also a normative one. It analyses

what is and goes beyond it by providing rules for judging what is fair and desirable and thus ought to be. Environmental impact studies and audits are now part of the economist's tool kit. How well and effectively they are used is another matter, but surely their absence is not an issue. Need one remind Ms Raworth that the United Nations Development Programme walked away from the Narmada Project funding when the 21st century economic thinking was still a generation away?

Finally, the doughnut. Surely this unhealthy, cholesterol- and sugar-laden piece of junk food ought not be the chosen symbol of new-age concerns! Wouldn't an inner-tube flotation device of the same geometry, which teaches kids how to swim, have been a better one?

DOUGHNUT ECONOMICS

Seven Ways to Think Like a 21st Century Economist

Kate Raworth

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