ARBiT
it happens here...

Global Energy Independence Day

While this event is fairly recent, its background can be traced back to the early 20th century, when Nikola Tesla, the famous Serbian-American inventor, generated revolutionary ideas about sources of renewable energy that were far ahead of his time. From a political standpoint, many people believe that building towards a future of energy independence is helpful as it reduces the need to buy energy from foreign sources while increasing a nation's stability, economic growth, and political freedoms. A more local perspective means that the principles of energy independence can be applied to businesses, farms, neighbourhoods, and individual homes.

राष्ट्रदूत
WEDNESDAY
10 July 2024
A-B

#NUTRITION

High-Protein Vegetables

You need protein for several body functions. So, try these protein-rich vegetables to fulfill your daily protein requirements.

We include vegetables in every meal. They not only make our meals eye-appealing and delicious, but they also make sure that our body receives a wider variety of vital nutrients. However, most people suggest that green vegetables are more nutrient-dense when it comes to eating vegetables. Well, there is no denying that this is true but your diet should be focused on all the nutrients that your body needs. If you're a vegetarian, looking for ways to add protein to your diet, try these *protein-rich vegetables*.

Protein-Rich Vegetables

Protein is an essential component of all cells in your body. It is utilized to construct and repair tissues, as well as to produce enzymes and hormones. Protein is required for the growth of bones, muscles, skin, and blood and serves as a source of energy. Protein transports haemoglobin, which delivers oxygen to all of our cells. Moreover, it also helps to transport minerals and vitamins to the cells that require them. Due to these benefits, you require protein on a daily basis.

Vegetables You Must Eat

Peas

Peas are a rich source of vegetable protein and fiber. In fact, these little treats have less fat and cholesterol. Peas are also high in manganese, copper, phosphorus, folate, zinc, iron, and magnesium. They also include phytonutrients like coumestrol, which can help prevent stomach cancer. If you have not yet included peas in your diet, now is the time. Peas are great in curries, salads, and other dishes.

Kale

Kale is another excellent plant-based protein source. It also includes phenolic chemicals, which provide it antioxidant benefits. Kale contains omega-3 and omega-6 fatty acids, as well as vitamins K, C, A, and B6, calcium, potassium, manganese, and magnesium. It also includes lutein and zeaxanthin, which have been linked to a lower risk of cataracts and macular degeneration, respectively.

Broccoli

Broccoli is high in protein, low in fat, and low in calories. It's an excellent source of vitamins, minerals, and antioxidants, all supporting good health. Folate, manganese, potassium, phosphorus, and vitamins K and C are all found in broccoli. It also includes glucosinolates, which have been demonstrated to combat cancer.

Sweet Corn

You might be surprised but *sweet corn* is also a vegetable! Sweet corn is low in fat and high in protein, meeting roughly 9 per cent of the protein that you need every day. Corn also contains thiamine, vitamins C and B6, folate, magnesium, phosphorus, and magnesium. Corns may be used to make sandwiches, soups, and salads.

Cauliflower

Cauliflower has a high protein content. This adaptable vegetable may be used in several cuisines. Cauliflower contains sinigrin in addition to potassium, manganese, magnesium, phosphorus, calcium, vitamins C and K, and iron. This glucosinolate molecule may have anti-cancer and anti-inflammatory effects.

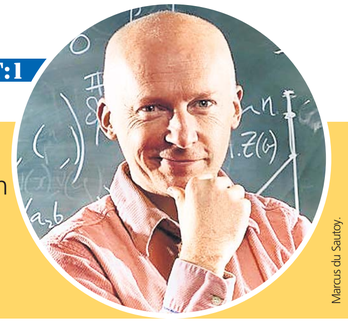
Spinach

Spinach is thought to be one of the richest in nutrients in leafy green vegetables. Protein, together with necessary amino acids, is claimed to contribute 30 per cent of its calories. Spinach is the second richest source of protein in vegetables. It contains nutrients like vitamin A, vitamin K, and vitamin C, which help to maintain an effective immune system, protect eyesight, and promote healthy blood flow.

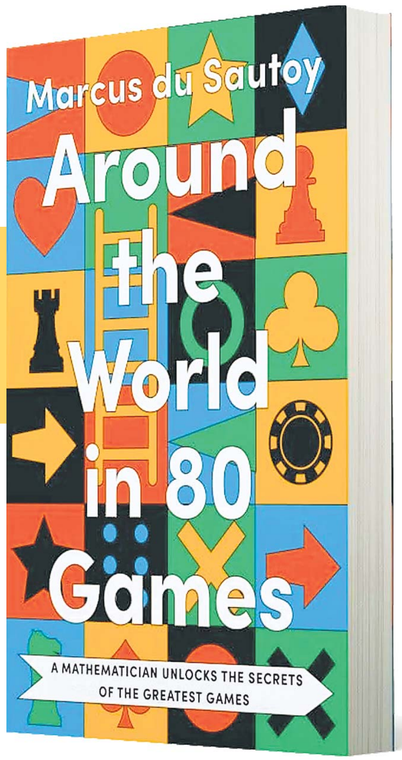
Games, Numbers And Play

PART: 1

Marcus du Sautoy is a professor of mathematics who loves to play games with Maths. Though, initially, he found math tough, once he discovered the magic of Math, there was no going back.



Marcus du Sautoy



Amia Srinivasan, Marcus du Sautoy, Mohit Satyanand, Pavan K. Varma, Pinky Anand, Varghese K.George, moderated by Vir Sanghvi.

Shailaza Singh
Published Author, Poet and a YouTuber

For most of us, a person good with mathematics would perhaps look like a nerd, wear high-power spectacles and would constantly prefer company of books over humans. At least, that is the perception we have grown up with. However, Marcus Du Sautoy begs to differ. Marcus is a British mathematician, Simonyi Professor of Public Understanding of Science at the University of Oxford, Fellow of New College, Oxford and the author of well-known books that dispel the myth and terror associated with mathematics. When I caught up with him for a tet-e-tet on the sidelines of the Jaipur Literature Festival this year, I realized that mathematics was not just about numbers but also nature. Some excerpts from a freewheeling chat with the man, who loves to play games with math, are here.

What is it like to visit the Jaipur Literature Festival?

Oh! Its hectic but so much fun. I get to talk about everything. I have been to seven sessions and each session has been a different experience. Today was games, yesterday was parenting in the digital age, I have done AI and publishing, AI and creativity, and tonight I'm talking about free speech.

So what do you like about the Jaipur Literature Festival?

This is my fourth time at the Jaipur Literature Festival. I love the fact that it brings so many people from different disciplines, different countries, different philosophies, and that I think what's so exciting is sharing time with people with very different ways of looking at the world. So, I'm a scientist, so it's nice to bring a scientific perspective on political issues, for example. I like the variety.

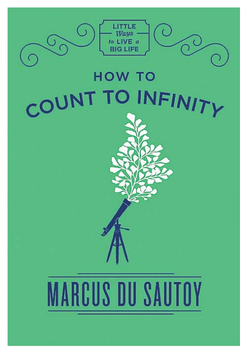
Have you been to Jaipur before?

I love coming to India, and especially Rajasthan. Last year, I came with my wife, and after the festival we travelled around Jodhpur, Udaipur, and I've been to also other places, before that. And in Jodhpur, we got to know a very wonderful family, who are into making carpets, and today, I'm having two carpets delivered to my hotel from the family. We are good friends with them. They invited us to their daughter's wedding, but unfortunately, it was two weeks before the festival, so we couldn't go.

#CHIT-CHAT

Okay, can you share some of those stories, maybe one story about what made it so interesting for you?

Yeah, sure. For example, Fibonacci numbers, which many kids might see, but it's not on curriculum. So, these are numbers which go 1, 1, 2, 3, 5, 8, and there's a pattern because you add the two previous numbers. 5 plus 8 gives you 13, 8 plus 13 gives you 21, 13 plus 21 gives you 34. So, these numbers are growing out of the other numbers. Now, these numbers are all over nature. If you count the number of petals on a flower, it's either 5 or 8 or 13. If you cut open a fruit, like an apple, you get a 5-pointed star. A banana has a 3-pointed star, a persimmon has an 8. If you take a pineapple and you count the number of cells, it's a Fibonacci number. When I tell this to my children, and respond about nature doing mathematics, they start thinking that math must be important, it's not something arbitrary. But the other beautiful thing is these numbers are important in music as well. If you're a drummer, a tabla player, with long and short beats, the number of rhythms goes in this sequence, 5, 8, 13. So, for me, that's the kind of story you want to tell. Then, the numbers start to creep into nature, into music, into poetry. And then, that connects with the things, you know, maybe, your child is not immediately interested in numbers, but they might like music. Or they might like the garden. For me, that's the key, finding why mathematics is everywhere. And then, children start saying, "I want to understand the world, I need to understand maths."



Was Mathematics easy for you as a child?

Math wasn't necessarily easy for me. I think that you have to remember that mathematics is a little bit like learning a musical instrument. You can't play the piano immediately. You have to practice, spend time in that world, and gradually, it gets easier. I think people have to remember that you don't have to get everything right the first time, but you have to understand why you got something wrong and learn from that. I only fell in love with mathematics when I was about 12 or 13, and the key for me was seeing some exciting stories about mathematics, not just doing multiplication and all the technical side. And again, it's like learning an instrument. If you just did scales and arpeggios, you get bored. That's not music. Sometimes, I feel like the mathematics taught in school is not real mathematics. Fortunately, I had a teacher who showed me these stories about math. Things about prime numbers, Fibonacci numbers, infinity, geometry, and for me, that was what made me fall in love with the subject, seeing that there were so many exciting stories inside there, which if I had learnt the mathematics I did at school, I'd be able to understand or now write myself.

How can that happen?

I think what AI is very good at is learning behaviours. So, if we give it empathetic behaviour, then, it will produce empathetic results. If we lead it astray by depicting abusive behaviour, it will respond with abusive results. We've seen many examples of this, where a chatbot put online interacts with people who are racist, misogynist, and it learns how to repeat that, and that's what we don't want. We're at the moment in control of its evolution, and so, we need to take responsibility to take it in a positive direction.

Does that mean that if we create robots or anything, it will learn that behaviour?

Yes. And unfortunately, because it's learning on human behaviour, and human behaviour is not always terribly good, there are dangers that this thing is learning to succeed at the expense of everybody else. That is not a great learning model.

So, will we need to reformat the humans first?

(Laughs) I think so, right? That's a very good way to put it. But I think that's what's interesting and I think people don't realize this, the AI, that is emerging, is a reflection of our values and our way of looking at the world, because it's learning from our world, our art, our writing, our literature. And so, it's not a new thing. It's a new take on an old thing, which is humanity.

To Be Continued

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How can teachers convert Mathematics into a Game for children?

I think we're in a golden age, where a teacher, who may not be so confident with mathematics, can still teach well because there are lots of resources on the internet, that they can use, to try and help the children. In particular, for example, I created an *internet maths school* based on gaming. It's called *MangaHigh.com*, and what we did was to take the mathematical curriculum, turn it into a game and then, the kids learn mathematics by playing the game. And the game is clever enough so it understands. Well, the student is finding this difficult, so it takes them down a level to lift their confidence up, or if a student is just eating it all up, so, it pushes them to the higher levels. I think we're in a great age where technology can help a teacher, not replace a teacher.

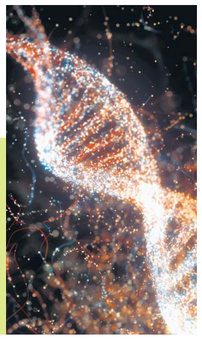
Somewhere, you said that there is a possibility that AI can become conscious. What if that happens? Will we be in danger?

With new technologies, there are always positives and negatives, and it's about how we use that technology. So, if AI becomes conscious, we want it to be empathetic to the human race. We can we create AI that understands us and we understand it. So, as with any new relationship, it's about building trust. If the thing is conscious, it's sophisticated, then, we'll understand because we want to create an AI, which isn't incentivized to wipe out humanity.

#EVOLUTION

Human DNA Is Everywhere

Tracing along a river that winds through town on its way to the ocean, Duffy found human DNA everywhere but the remote mountain stream where the river starts, far from civilization.



Human DNA can be found nearly everywhere, short of isolated islands and remote mountaintops, according to a new study.

That ubiquity is both a scientific boon and an ethical dilemma, say the researchers who sequenced this widespread DNA. The DNA was of such high quality that the scientists could identify mutations associated with disease and determine the genetic ancestry of nearby populations. They could even match genetic information to individual participants, who had volunteered to have their errant DNA recovered.

David Duffy, a professor of Wildlife Disease Genomics at the University of Florida, who led the project, says that ethically handled environmental DNA samples could benefit fields from medicine and environmental science to archaeology and criminal forensics.

For example, researchers could track cancer mutations from wastewater or spot undiscovered archaeological sites by checking for hidden human DNA. Or detectives could identify suspects from the DNA floating in the air of a crime scene.

But this level of personal information must be handled extremely carefully. Now, scientists and regulators must grapple with the ethical dilemmas inherent in accidentally, or intentionally, sweeping up human genetic information, not from blood samples but from a scoop of sand, a vial of water, or a person's breath.

"We've been consistently surprised throughout this project at how much human DNA that we find and the quality of that DNA," Duffy says. "In most cases, the quality is almost equivalent to if you took a sample from a person."

Because of the ability to potentially identify individuals, the researchers say that ethical guardrails are necessary for this kind of research. The study took place with approval from the institutional review board of the university, which ensures that ethical guidelines are adhered to during research studies.

"It's standard in science to make these sequences publicly available. But that also means that if you don't screen out human information, anyone can come along and harvest this information," Duffy says. "That raises issues around consent. Do you need to get consent to take those samples? Or institute some controls to remove human information?"

Duffy's team at the University's Whitney Laboratory for Marine Bioscience and Sea Turtle Hospital has successfully used environmental DNA, or eDNA, to study endangered sea turtles and the viral cancers that they are susceptible to. They've plucked useful DNA out of turtle tracks in the sand, greatly accelerating their research program.

The scientists knew that human eDNA would end up in their turtle samples and probably many other places they looked. With modern genetic sequencing technology, it's now straightforward to sequence the DNA of every organism in an environmental sample. The questions were how many human DNA there would be and whether it was intact enough to harbour useful information.

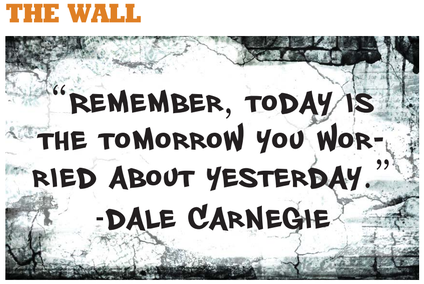
The team found quality human DNA in the ocean and rivers surrounding the Whitney Lab, both near town and far from human settlement, as well as in sand from isolated beaches. In a test facilitated by the National Park Service, the researchers travelled to part of a remote island that people never visit. It was free of human DNA, as expected. But they were able to retrieve DNA from voluntary participants' footprints in the sand and could sequence parts of their genomes, with permission from the anonymous participants.

Duffy also tested the technique in his native Ireland. Tracing along a river that winds through town on its way to the ocean, Duffy found human DNA everywhere but the remote mountain stream where the river starts, far from civilization.

The scientists also collected room air samples from a veterinary hospital. They recovered DNA matching the staff, the animal patient, and common animal viruses.

Now that it's clear that human eDNA can be readily sampled, Duffy says that it's time for policymakers and scientific communities to take issues around consent and privacy 'seriously' and balance them against the possible benefits of studying this errant DNA. "Any time, we make a technological advance, there are beneficial things that the technology can be used for and concerning things that the technology can be used for. It's no different here," Duffy says. "These are issues we are trying to raise early so that policy makers and society have time to develop regulations."

THE WALL



BABY BLUES

By Rick Kirkman & Jerry Scott

ZITS

By Jerry Scott & Jim Borgman