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UNIVERSITY COURSES CAMPUS



"KYTOS"

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Institute of Management Studies, Ghaziabad
University Courses Campus

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Editor's Message

"To me, the greatest pleasure of writing is not about what it is about, but the inner music the words make.....Truman capale."

Dear Readers,

In agreement with the above quote, I find writing as the most valuable literary expression. We are really proud and exuberant to acclaim that we are ready to finally introduce our very own

e-magazine... The magazine delves into various branches of biological science from chaos of microbe world to orderly laws of gene editing. It also consists of horizon of information like Articles, Science facts, Quizzard, Achievements and events at School of Biosciences. We have put in relentless efforts to bring excellence to this treasure trove. Helen Keller rightly said that the "World is moved along not only by the mighty shoves of its heroes, but also by the aggregate of the tiny pushes of each honest worker". This herculean task of editing this school magazine would not have been possible without the sincere support of the members of the Editorial Board.

It is a fine thing to have ability, but the ability to discover ability in others is the true test. I am really thankful to our respected Director ma'am for entrusting me with the responsibility of being a part of the Editorial Board.

I heartily endow all the readers my best wishes and hope this souvenir will enjoy your critical acclaim and prove itself as a vital role in exploring magical world of science.

OUTBREAK OF MYSTERIOUS ILLNESS

Dr. Chhavi Sharma
Assistant Professor
IMSUC

According to China's National Health Commission a never before seen virus, detected in the central Chinese city of Wuhan, has claimed twenty four lives and infected hundreds of Chinese citizens with a pneumonia-like illness. It was first reported to the World Health Organization on Dec. 31, 2019. Chinese scientists have linked the disease to a family of viruses known as "coronaviruses," the same family as the deadly SARS (Severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome) viruses. Scientists are yet to fully understand how dangerous the new virus, labelled 2019-nCoV, might be.

Researchers and investigators are just beginning to understand from where it originated, how it is transmitted, how far it has spread and what symptoms patients present with. As with in a month, case numbers have risen steeply to over 830 in China till 24th January 2020. The bulk are in China, but cases have been confirmed in Thailand, Japan, South Korea and now the US, where a man in his 30s in Washington state presented with the disease at a local hospital. Chinese authorities also confirmed health workers have been infected with virus, suggesting it has achieved human-to-human transmission. As a result the WHO will convene an Emergency Committee to explore whether the virus constitutes a public health emergency and three US airports have begun to screen incoming passengers for signs of illness.

Typically, these types of viruses are found in animals ranging from livestock to household pets and wildlife such as bats. When they make the jump to humans they can cause fever, respiratory illness and inflammation in the lungs. In immunocompromised individuals, such as the elderly or those with HIV-AIDS, they can cause severe respiratory illness.

What is a coronavirus? Where did the virus come from?

The mysterious virus appears to have originated in the Huanan Seafood Wholesale Market in Wuhan, a Chinese city of over 11 million people. The market sells fish, as well as a panoply of other animal meats. However, it's still unknown whether it emerged from an animal species like

previous coronaviruses, SARS and MERS. Markets have been associated in the origin and spread of viral diseases in past epidemics and a large majority of the confirmed cases seen so far had been to the Huanan Seafood marketplace in recent weeks. The market seems like an essential part of the mystery, but researchers will need to undertake a range of experiments and testing to confirm the virus' origin, said Raina MacIntyre, a head of the biosecurity research program at the University of New South Wales' Kirby Institute. Chinese scientists were able to isolate and unravel the genetic code of the 2019-nCoV from patients, leading out other potential causes such as influenza, and confirm it is completely new. However the genetic code shows this virus has around 70% similarity to the SARS coronavirus.

Understanding the genetic code help researchers in two ways:

1. It allows them to create tests that can identify the virus from patient samples.
2. Gives researchers potential insight into creating treatments or vaccines.

Corona viruses are a large group of viruses that can cause illnesses as minor as cold. It belongs to a family of viruses known as Coronaviridae, contain a strand of RNA within their envelope and cannot reproduce without getting inside living cells and borrowing the machinery found within. The electron microscopic image reveals, spikes on their viral envelope, help them bind to cells, which gives them a way in. Once inside they turn the cell into a virus factory, using its molecular conveyor belt to produce more viruses which are then shipped out of cell. The virus progeny infects another cell and the cycle starts again.

CHINA

Coronaviruses

Coronaviruses are a large family of viruses that cause not only the common cold but also more serious respiratory illnesses

2019-nCoV OUTBREAK

December 31, 2019

Symptoms

- Unknown incubation period
- Fever
- Difficult breathing
- Impaired liver and kidney function
- Kidney failure
- Severe cough
- Pneumonia

A novel coronavirus (2019-nCoV) was identified as the source of the illnesses on January 7, with the infection traced to a Wuhan seafood market that also sold live animals



Middle East Respiratory Syndrome (MERS)

Identified in Saudi Arabia in 2012 - Spread to 27 countries, 2,484 confirmed cases | 858 deaths



Severe Acute Respiratory Syndrome (SARS)

Emerged in southern China in 2002 - Spread to 30 countries, 8,437 cases | 813 deaths



Source: Al Jazeera | Last updated: Jan 21, 2020

@A3Labs ALJAZEERA

The S1 region of the spike protein first binds to a receptor on a human (or animal) cell, and the S2 region then fuses and allows the virus to enter that cell. Vineet Menachery from University of Texas Medical Branch, says the S2 portion of the spike protein on the coronavirus matches that of the SARS virus, but the S1 region is somewhat different, means 2019-nCoV could use a different cell receptor for entry than the SARS virus does. However, a preliminary study came out from Wuhan based scientists suggests that the two viruses utilize the same cell entry receptor, ACE2.

It's possible that antiviral treatments currently used to treat other viruses may be able to treat this new virus. The genomic analysis has suggested that the virus' RNA polymerase—the target of one such drug called remdesivir is conserved in 2019-nCoV. Vineet Menachery, says the treatments haven't been approved before clinical trial.

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Some of the most important characteristics of the disease can't be understood from the virus' genome alone. It was only few days before that researchers determined the virus could spread between humans and did not require direct contact with an infected animal. Researchers still aren't sure how it is transmitted between people. "Is it shed only in respiratory secretions? Is it found in the urine, blood and stool? What's infectious? How long's it infectious? How high the viral load can get," "all those things are enabled by the genome, certainly. But you can't deduce it from the genome."

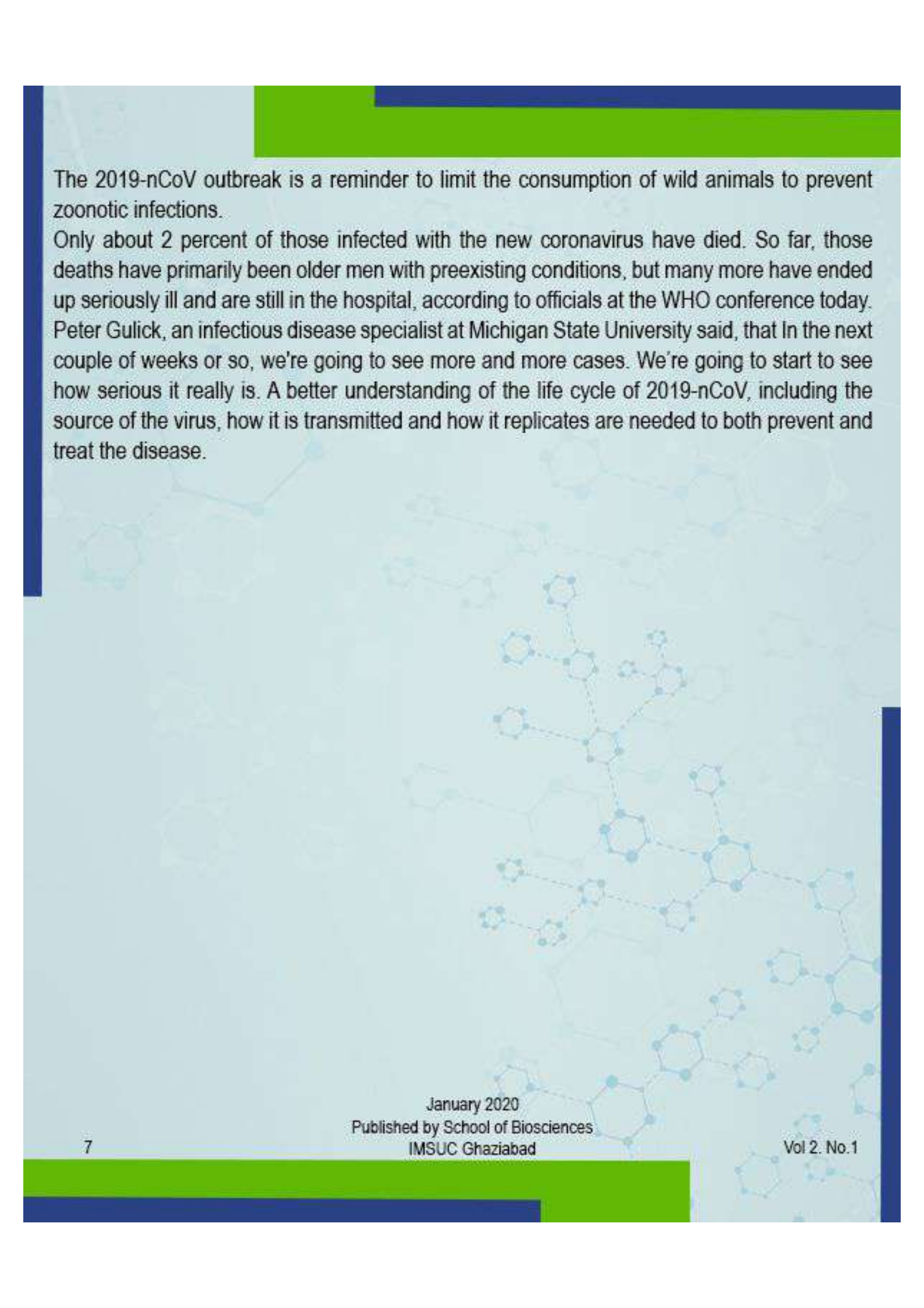
Scientists will need to keep comparing new samples to determine how the virus adapts or their mutations in the virus adapting to the human population as it infects more people.

Bats and Snake could be the major source of recent outbreak

On January 22, a team of China based scientists published an article based on the virus' genome that suggested it's possible the coronavirus emerged from snakes. They used an analysis of the protein codes favored by the new coronavirus and compared it to the protein codes from coronaviruses found in different animal hosts, like snakes, marmots, hedgehogs, birds, bats and humans. Surprisingly, they found similarities between protein codes of 2019-nCoV and in snakes.

Snakes habitually hunt for bats in wild. Reports indicate that snakes were sold in the local seafood market in Wuhan, raising the possibility that the 2019-nCoV might have jumped from the host species bats to snakes and then to humans at the beginning of this coronavirus outbreak. However, how the possibilities of virus adaptation to both the cold blooded and warm blooded hosts remain a mystery.

Searching for the 2019-nCoV sequence in snakes would be the first thing to do and requires laboratory experiments. However, since the outbreak, the seafood market has been disinfected and shut down, which makes it challenging to trace the new virus' source animal. Sampling DNA from animals sold at the market and from wild snakes and bats is needed to confirm the origin of the virus. Nonetheless, the reported findings will also provide insights for developing prevention and treatment protocols.



The 2019-nCoV outbreak is a reminder to limit the consumption of wild animals to prevent zoonotic infections.

Only about 2 percent of those infected with the new coronavirus have died. So far, those deaths have primarily been older men with preexisting conditions, but many more have ended up seriously ill and are still in the hospital, according to officials at the WHO conference today. Peter Gulick, an infectious disease specialist at Michigan State University said, that In the next couple of weeks or so, we're going to see more and more cases. We're going to start to see how serious it really is. A better understanding of the life cycle of 2019-nCoV, including the source of the virus, how it is transmitted and how it replicates are needed to both prevent and treat the disease.

The background of the cover features a faint, light blue molecular structure pattern, possibly representing a protein or a complex organic molecule, overlaid on a light blue gradient. The pattern consists of interconnected hexagonal and pentagonal rings with small dots representing atoms.

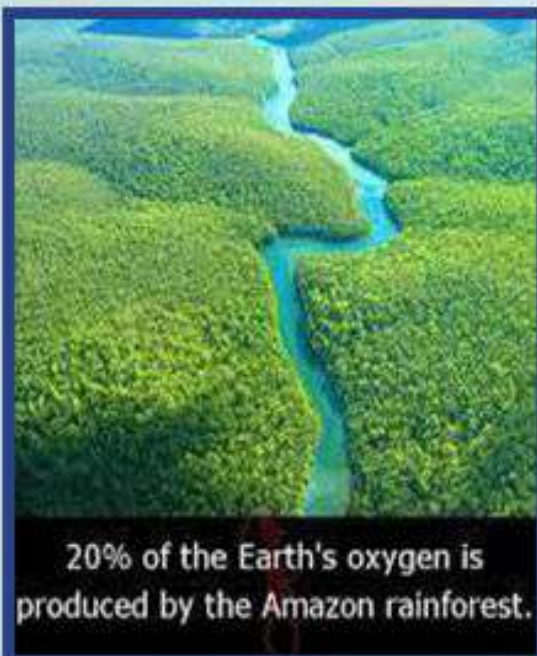
AMAZING FACTS 2019

1. The Eiffel Tower can be 15 cm taller during the summer



When a substance is heated up, its particles move more and it takes up a larger volume – this is known as thermal expansion. Conversely, a drop in temperature causes it to contract again. The mercury level inside a thermometer, for example, rises and falls as the mercury's volume changes with the ambient temperature. This effect is most dramatic in gases but occurs in liquids and solids such as iron too. For this reason, large structures such as bridges are built with expansion joints which allow them some leeway to expand and contract without causing any damage.

2. 20% of Earth's oxygen is produced by the Amazon rainforest



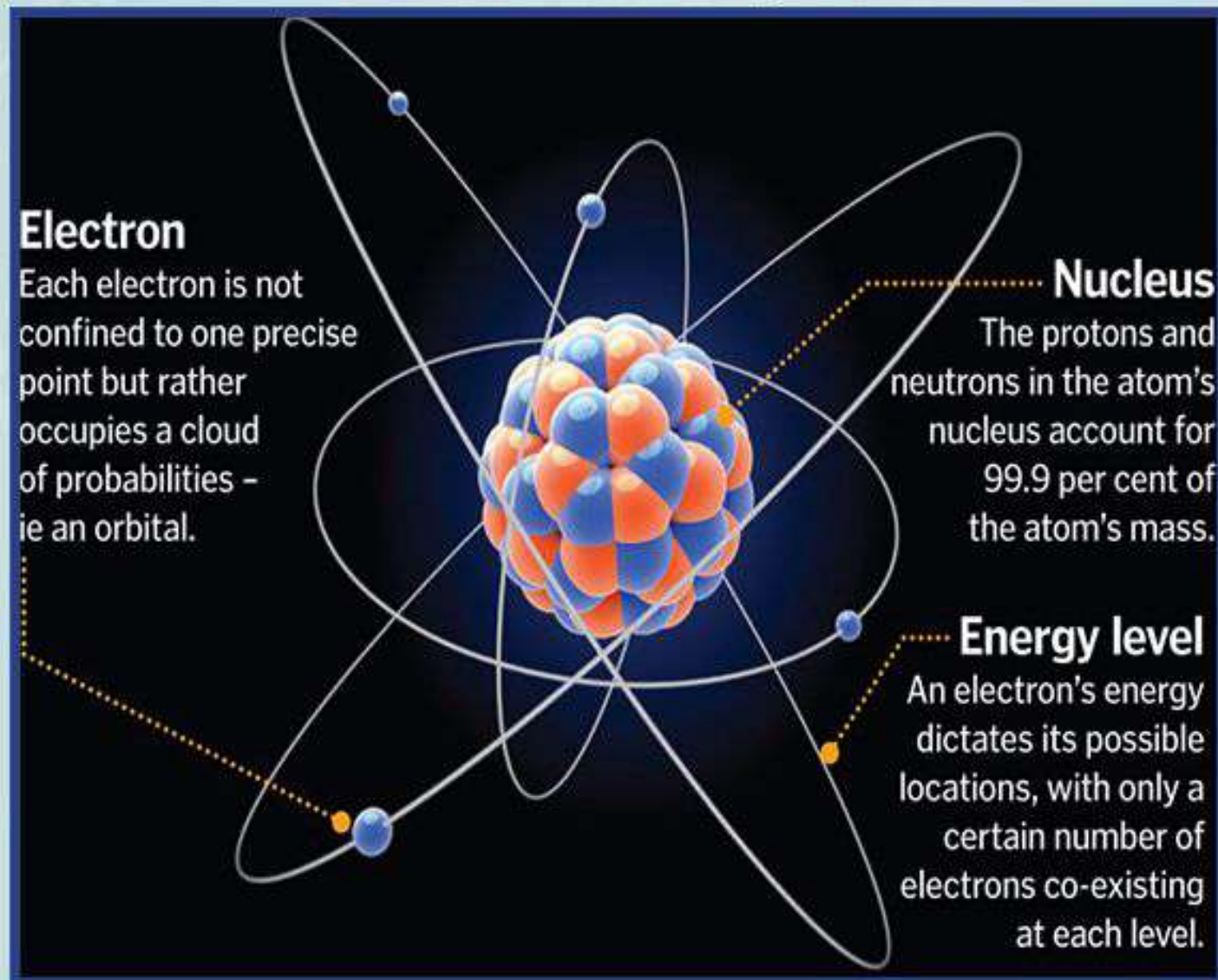
Our atmosphere is made up of roughly 78 percent nitrogen and 21 percent oxygen, with various other gases present in small amounts. The vast majority of living organisms on Earth need oxygen to survive, converting it into carbon dioxide as they breathe. Thankfully, plants continually replenish our planet's oxygen levels through photosynthesis. During this process, carbon dioxide and water are converted into energy, releasing oxygen as a by-product. Covering 5.5 million square kilometres, the Amazon rainforest cycles a significant proportion of the Earth's oxygen, absorbing large quantities of carbon dioxide at the same time.

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3. If you took out all the empty space in our atoms, the human race could fit in the volume of a sugar cube



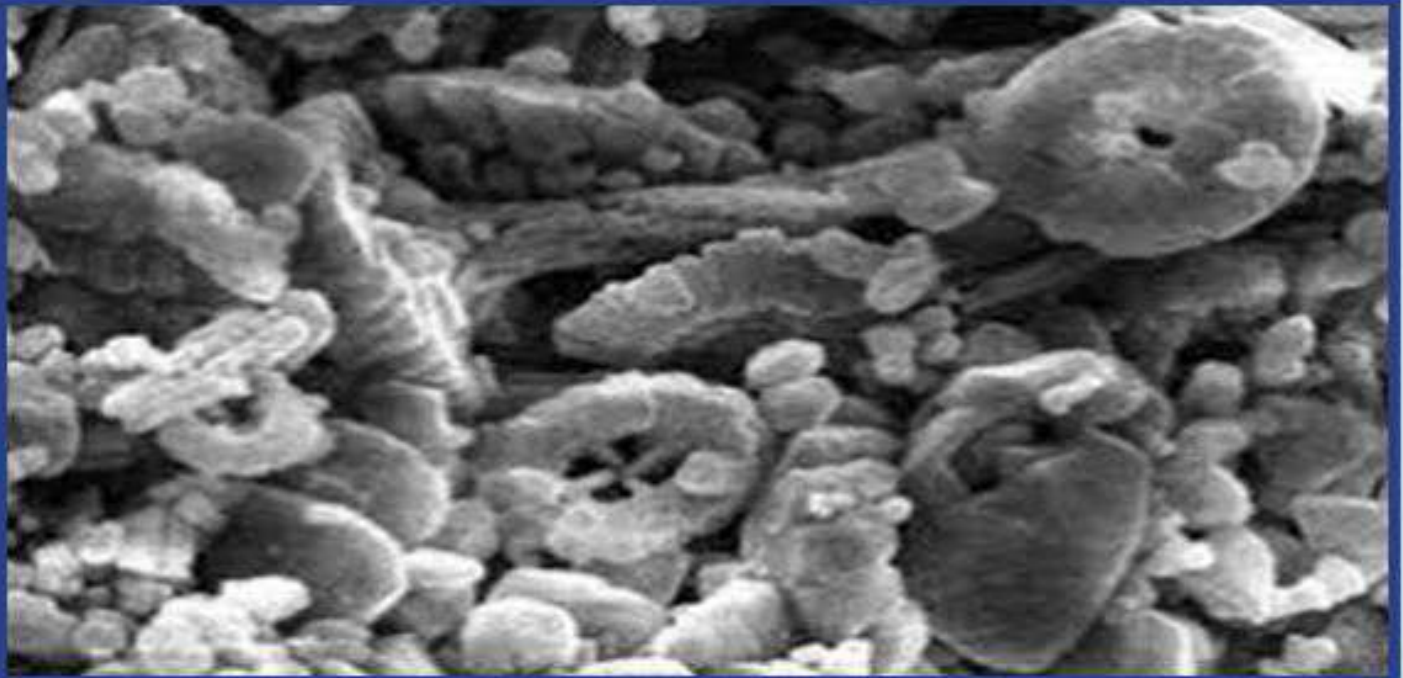
The atoms that make up the world around us seem solid but are in fact over 99.99999 per cent empty space. An atom consists of a tiny, dense nucleus surrounded by a cloud of electrons, spread over a proportionately vast area. This is because as well as being particles, electrons act like waves. Electrons can only exist where the crests and troughs of these waves add up correctly. And instead of existing in one point, each electron's location is spread over a range of probabilities – an orbital. They thus occupy a huge amount of space.

4. Stomach acid is strong enough to dissolve stainless steel



Your stomach digests food thanks to highly corrosive hydrochloric acid with a pH of 2 to 3. This acid also attacks your stomach lining, which protects itself by secreting an alkali bicarbonate solution. The lining still needs to be replaced continually, and it entirely renews itself every four days.

5. Chalk is made from trillions of microscopic plankton fossils



Tiny single-celled algae called coccolithophores have lived in Earth's oceans for 200 million years. Unlike any other marine plant, they surround themselves with minuscule plates of calcite (coccoliths). Just under 100 million years ago, conditions were just right for coccolithophores to accumulate in a thick layer coating ocean floors in a white ooze. As further sediment built up on top, the pressure compressed the coccoliths to form rock, creating chalk deposits such as the white cliffs of Dover. Coccolithophores are just one of many prehistoric species that have been immortalised in fossil form, but how do we know how old they are? Over time, rock forms in horizontal layers, leaving older rocks at the bottom and younger rocks near the top. By studying the type of rock in which a fossil is found palaeontologists can roughly guess its age. Carbon dating estimates a fossil's age more precisely, based on the rate of decay of radioactive elements such as carbon-14.

Adapted from

<https://www.howitworksdaily.com/15-amazing-science-facts-that-will-blow-your-mind/>

Beating -Plastic Pollution

Sakshi Saxena Nanda
Executive HR @ R1CM

Plastic is widely used in our day life. Starting from pen to a polythene bag in which we carry fruits and vegetables are forms of plastics. Though convenient to use, it has posed an alarming threat to our environment. Plastics are organic polymers of high biodegradable mass and other substances. It is non-biodegradable and do not decay by microbial action of microbes. Due to their low cost, ease of manufacturing, non-corrosiveness and versatility, plastics are used for multiple purposes at different scales.

The prolific use of plastic in our world is staggering — humans have created some 8.3 billion metric tons of the stuff-the equivalent of 800,000 Eiffel Towers. They remain in the same state as we throw them, so dumps or garbage are created and leading to **plastic pollution**.

Plastic pollution is the accumulation of plastic objects and particles (e.g. plastic bottles polythene bags and much more) in the Earth's environment that adversely affects wildlife, wildlife habitat, and humans. Plastic pollution is one of the biggest reasons behind the decline in marine wild life and increase in land waste and water waste.

Critical impact of Plastic

Plastic has become an indispensable material in modern society. Worldwide one million plastic bag and one million plastic bottles are used every minute. About 50 percent of our plastic is single use plastic and it constitutes 10 percent of total waste generated. In 2015, scientist said that "of the nearly 7 billion tons of plastic waste generated only 9 percent was recycled, 12 percent incinerated, and 79 percent accumulated in landfills or the environment." It has harmful effects on the land and rivers by affecting wildlife and habitat, and on human health.

On Environment

This plastic debris contains compounds that can be chemically transferred to organisms during ingestion. Some of these molecules are potentially toxic and can accumulate in the body. Besides, plastic bags also affect the growth of crops, by hindering the process of photosynthesis in agricultural fields.

On Animals

The most direct effect of plastic pollution is the imprisonment of animals in nets or large debris. It is a cause of significant mortality of marine mammals, turtles and birds. A second direct effect is ingestion, that concerns the entire food chain of the marine ecosystem.

On Humans

Because of the chemical additives used during plastic production, plastics have potentially harmful effects on human health. Indeed, exposure to toxic chemicals coming out of plastic can cause cancers, birth defects, impaired immunity and other health problems.

In India, which accounts for almost 18% of the world population in 2.4% of the global land, the accumulation of plastic is huge. According to a 2016 report by Business Standard, India produces more than 15,000 tons of plastic every day, of which 6,000 tons remains uncollected and littered.

Beating Plastic Pollution

Plastic is such a big part of our lives in today's time that we feel it's not possible to live in a world without plastic at all. Sure, we cannot curb the use of plastic completely, but we can reduce it drastically. Also small lifestyle changes, education and outreach efforts can add up to make a big difference. Few steps we together can implement in beating plastic pollution:

1. Avoid using microbeads- These are tiny chunks of plastic scrubbers present in the products like scrubs, toothpaste, body washes. Due to their tiny size, these beads slip through water treatment plants. Many marine animals confuse them for food and consume them. These beads have affected marine wildlife adversely. One can opt for natural exfoliators like salt, sugar and oatmeal instead of these scrubbers.

2. Replace plastic bags with jute bags/cloth bags- Always carry a bag along with you while shopping.

3. Stop throwing polybags in rivers in the name of God-There are many people who throw flowers, money, food, coconuts wrapped in plastic polybags in rivers like Yamuna and Ganga after performing various poojas. This is one of the major reasons that river Yamuna has become polluted so drastically over the few decades.

4. Cut down period waste-Switch to pads that are bio-degradable. Cotton pads help in cutting plastic pollution and are quite cheaper in comparison to the non-biodegradable pads. Brands like Sakhi, Saathi and Suvidha sell organic pads in India.

5. Carry reusable water bottles and no plastic straws-Instead of buying water bottles every day, we can switch to a dedicated reusable bottle for carrying water and use bamboo straws

6. Reduce, recycle Reuse and Educate – We should try to educate maximum people in our locality about harmful effects of plastic to our planet.

Need of better laws In India to save Environment

Like any other country, Waste Management is a pressing issue in India, especially with the unceasing growth of consumerism throughout the nation. Interestingly, almost 60 per cent of the total plastic waste generated in India gets recycled while the remaining escapes into the environment. However, most of this plastic is down-cycled. At this juncture, India needs robust and stringent waste management tools to substantially improve the situation. Since the 1980s, many global north countries have predicted the inexorable and unintended consequences of using plastics in the long run and began to address the matter at a slow pace by adopting legal measures, instruments or punitive actions to dwindle the distribution and consumption of plastics across these countries.

India, despite strengthening its stance against packaging plastics, it is failing to effectively implement it due to the dearth of infrastructure, enforcement, and availability of affordable alternatives. Besides this, most policies cease to exist due to impracticality and the absence of penalties to bring a long-lasting change. A form of punitive punishment binds citizens from illegal activities.

Apparently, various governments across the world have come up with creative policies to mitigate the plastic threat for instance, a new policy was introduced in one of the cities of Indonesia to collect used plastic bottles in exchange for free bus rides across the city. Whereas, UK has imposed a policy passed a policy of plastic packaging tax on production and importation to be effective from 2022.

India appears to have taken a step back from its 2018 **World Environment Day** pledge to phase-out all single-use plastic by 2022. Recent announcements on phasing out single use plastics have not made any mention of the plan to eliminate single-use plastics by 2022. Hence, without a time-bound road map that also includes affordable alternatives to single-use plastic, the aim of a complete elimination will be difficult to achieve.

Glimpse of GENESIS 2019





SYMPOSIUM 2020 ***@School of Bioscience***



IMSUC Graduate Students Cheering up @Sharda University

The Biotechnology graduate students of second year of Institute of Management studies University Courses bagged a cash prize of Rs 10,000/- for representing their project on "Waste Not Want Not" at Hackathon 2" organized by Sharda University Greater Noida in association with the Greater Noida Industrial Development Authority (GNIDA) to encourage young bright minds to innovate smartest projects. The team was lead by Aditya Pathak followed by Bharti Singhal , Darshan Deep and Divya Badoni who gave a novel approach to decompose paddy straw in minimum time utilizing kitchen scraps. They proposed that the decomposed material will convert the material into organic compost that is environment friendly and can be utilized for organic farming.



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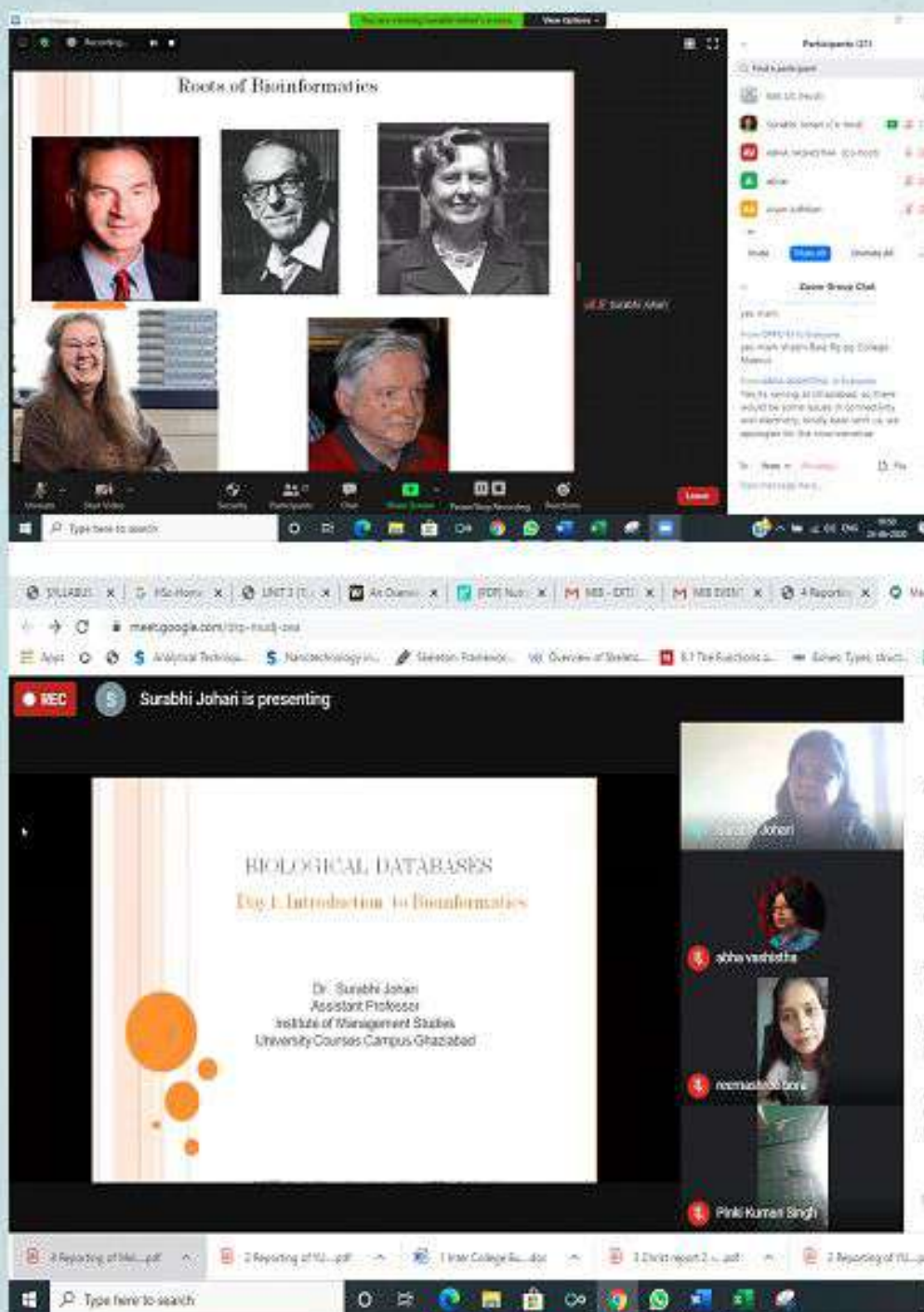




The Bionics Club, School of Biosciences assiduously organized the event '**UNCODE THE FUNMODE**' having the sole purpose of knowledge with fun and creativity towards science. The event was organized in the college premises in MDP room on 6th November 2019. The activities consists of three rounds **Who Am I? , Create the Avatar and Musical Trivia**



Debate is one of the academic activities that give students creative room to express what they feel. The length and breadth of knowledge that they gain through this is simply unparalleled. With the same perspective in view, Bionics Club, School of Biosciences organised an Intra-college debate competition on September 27, 2019. The aim of the competition was to hone public speaking skills of the students and teach them to be articulate while expressing their thoughts and opinions.



School of Biosciences, IMS Ghaziabad University Courses Campus organized 10 days online workshop on "Elementary Bioinformatics" from 24 June -3 July with 370+ registrations. The workshop was devoted to computational challenges of important biological problems.

The goal of this workshop is to provide hands on training in implementing various optimization techniques for using public biological databases that have both research and implementation aspects.

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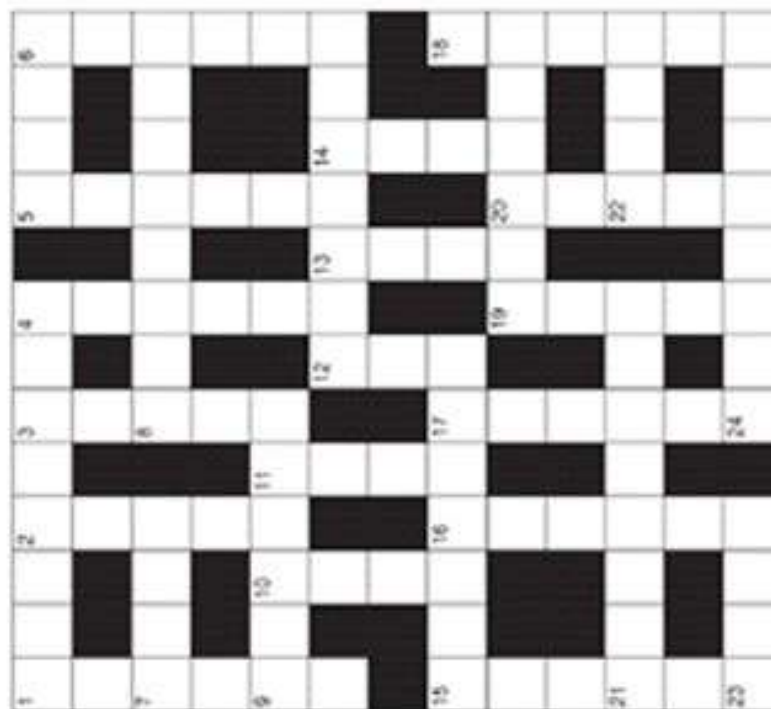
Around The World

ACROSS

1. US volcano, Mount ... (2,6)
5. Supersonic planes
7. Taj Mahal city
8. Cambridge & Oxford universities
9. Treeless Arctic zone
12. Coniferous tree found in Europe
15. Vienna is there
19. Croatian capital
21. Peninsula in southwest England
22. Manchurian river
23. Central attraction of Piccadilly Circus
24. Region that includes Japan, China and Korea (4,4)

DOWN

1. Roughly built settlements, ... towns
2. Large African antelope
3. Nasty disease named after a river in the Democratic Republic of the Congo, ... virus
4. Underground train system
5. City of northwest India
6. People from Stockholm
10. Scotland's monster lake, Loch ...
11. German industrial region
12. Washington-based spy group (1,1,1)
13. Italy's Leaning Tower of ...
14. Kuwaiti ruler



15. Native American tribe
16. Sport played at Wimbledon
17. Earth's glacial period (3,3)
18. Portugal and Spain
19. Bantu peoples of Natal
20. West African nation

The puzzle experts

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