



KNOW BEL

ENLIGHTENING THE NOBLES!



INTERNATIONAL
DAY OF
PEOPLE
WITH
DISABILITIES

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Enlightening the nobles!

WELCOME !

KNOWBEL is back with a pool of mind-boggling articles filled with rare facts and famous personalities from all over the world brought to you in yet another edition!

Through the journey of reading, don't forget to pause and feel the whiff of brainstorming quizzes and contests that'll create an adrenaline chill within you! Fabulous prizes await the winners with the chance of being featured in our next issue!

We also provide you the golden opportunity to showcase your quirky talents. Spread the message among friends and family members. Just as ripples spread out when a single pebble is dropped into water, your actions can illuminate the darkroom of knowledge!

Flip the page to discover more!
Magical things happen when you read!
So, keep calm and read on...
Thank You!

SPECIAL THANKS TO

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KNOWBEL

TABLE OF CONTENTS

01

INTRODUCTION

03

WONDERELLA

- *It's Time to Cast Beyond the Moon...*
- *Did Euclid Play a Mean Trick on Us?*
- *Don't Roll Those Eyes — You're Being Watched!*
- *How Land Birds Cross the Open Sea*
- *Who Ate the Baby? No, We're Not Talking About Cannibals!*
- *Curd — There's a Chemistry Lab in There!*

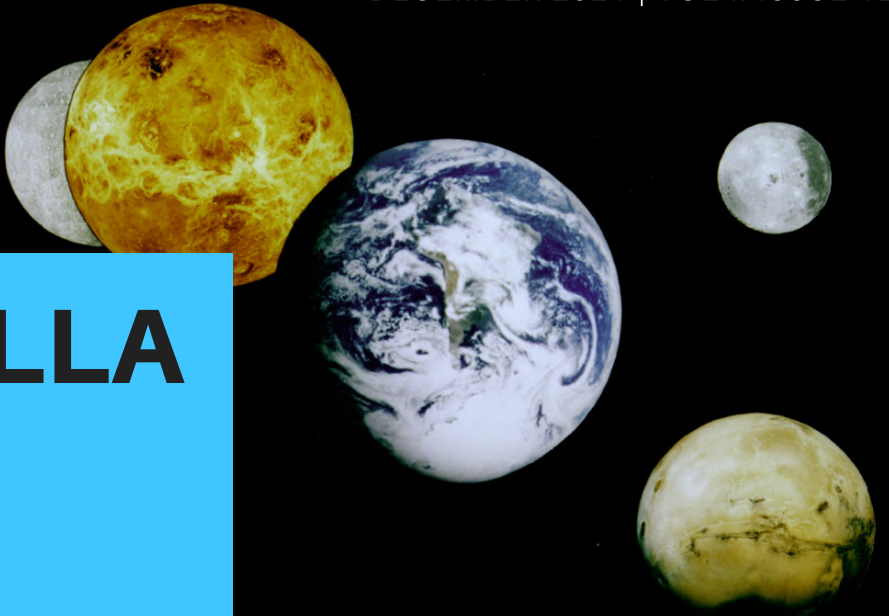
9

INSPIRON

- *Gregory Blackstock*

13

A DAY IN THE LIFE OF MANASI



WONDERELLA

Never Stop Questioning

In this issue:

It's Time to Cast Beyond the Moon...

Page 04

Did Euclid Play a Mean Trick on Us?

Page 05

Don't Roll Those Eyes — You're Being Watched!

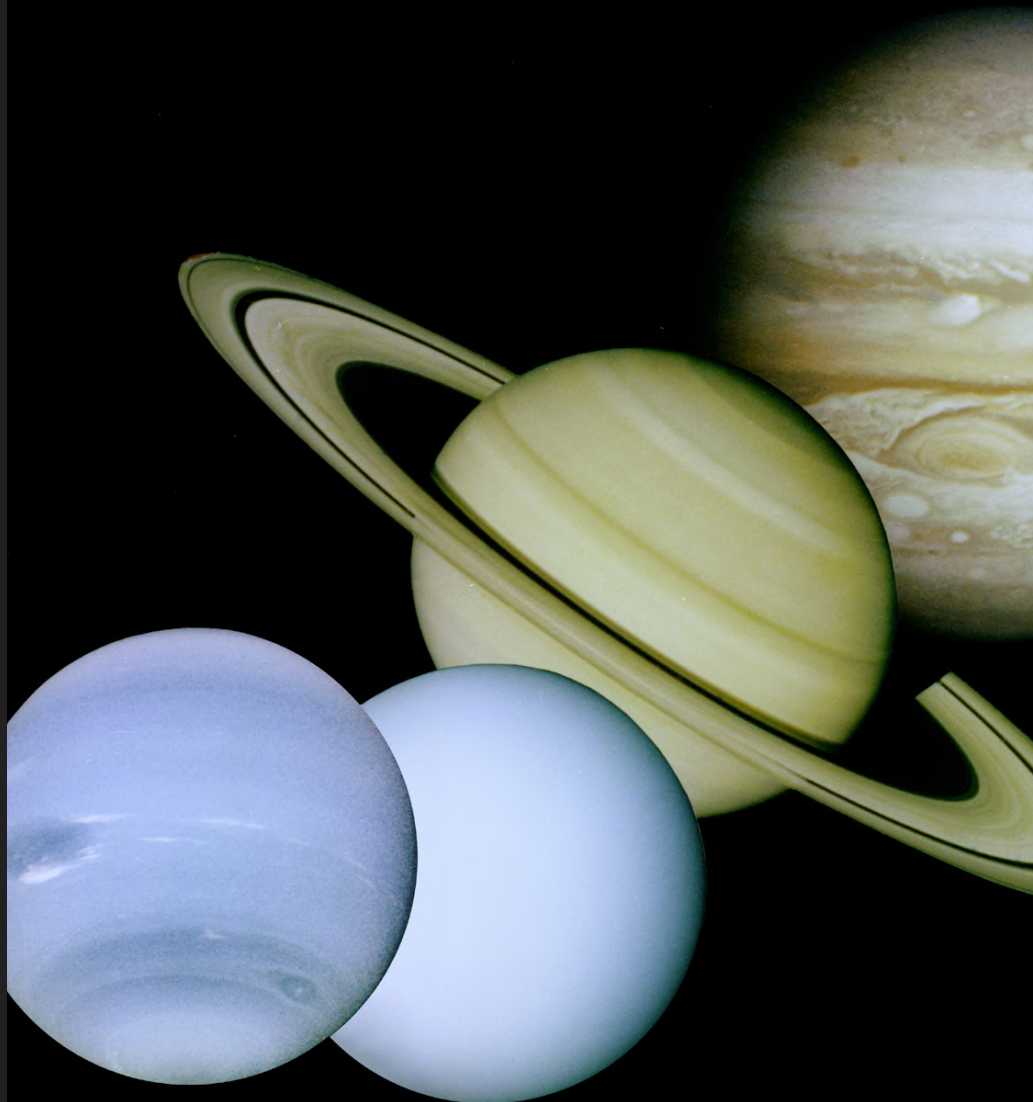
Page 06

Who Ate the Baby? No, We're Not Talking About Cannibals!

Page 07

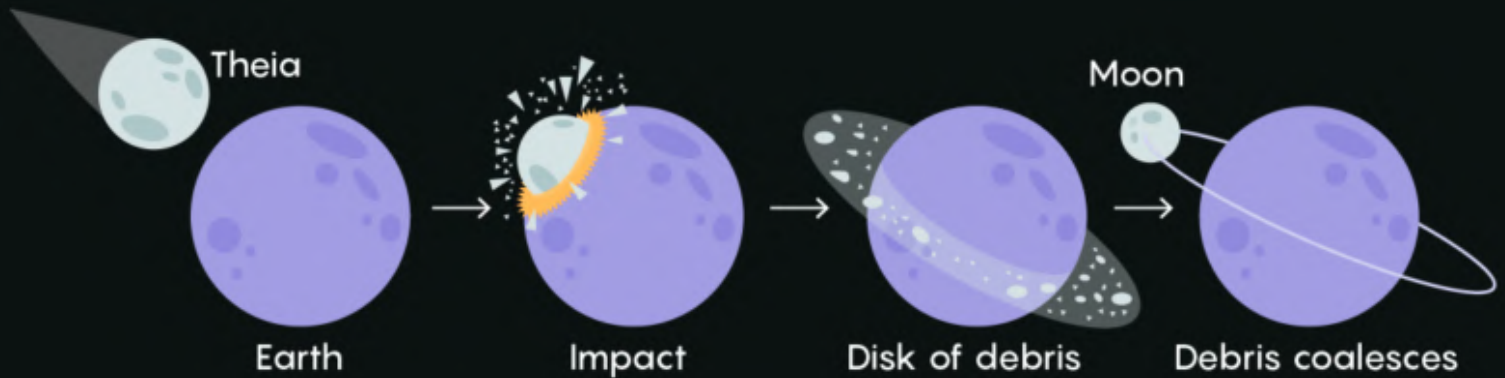
Curd — There's a Chemistry Lab in There!

Page 08



IT'S TIME TO CAST BEYOND THE MOON...

by Anuradha Meena



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The formation of the earth's moon is always a topic of interest, and still, it has not been completely understood. Presently, researchers are more interested in knowing the formation of natural satellites around distant exoplanets and their mechanism of formation.

For the first time, scientists have discovered a disk around a Jupiter-like exoplanet that bears the potential to produce moons. From the studies, it is also speculated that the circumplanetary disk around Jupiter is forming satellites. Moreover, scientists have also estimated the diameter of the disk, which is approximately the same as the distance from our sun to the earth. This can accommodate enough mass to form three moon-size satellites.

Planets are formed from the dusty disk around the young star. They carved the cavities and gobbled up the material of the circumstellar disk to grow. Through this process, the planet acquires its circumplanetary disk, which contributes to the growth of the planet by controlling the amount of material falling on it. With time, the gas and dust in the circumplanetary disk come together, collide multiple times to progressively form larger bodies, ultimately leading to the birth of moons.

Till now, astronomers have discovered 4000 exoplanets, but all of them populate to mature systems. So far, only two exoplanets have been found (PDS 70b and PDS 70c), which form a system reminiscent of the Jupiter-Saturn pair, and they are still in their stage of formation. They were first discovered using ESO's Very Large Telescope (VLT) in 2018 and 2019, respectively.

The latest high-resolution ALMA (Atacama Large Millimeter/submillimeter Array) observations have given further insights into the system. In addition to this, they have confirmed the detection of the circumplanetary disk around PDS 70c, but they found that PDS 70c is deprived of dust material in its natal environment.

In the last two decades, astronomers have made progress in this field. Now, scientists are moving ahead to take a big step of studying the disk around the young planets!

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DID EUCLID PLAY A MEAN TRICK ON US?

by Gaurav Pundir

Euclid, also known as Euclid of Alexandria, was a Greek mathematician who lived during the early 3rd century BCE. Back then, much of mathematics and specifically geometry, as we know it today, did not exist. However, things changed after Euclid wrote a mathematical treatise consisting of 13 books called Elements.

The Elements is a collection of some of the earliest examples of mathematical proofs, along with five postulates that are stated at the beginning. The word 'postulate' essentially means a statement that is taken to be true without any proof and serves as the background for proving or disproving other statements. In his Elements, Euclid adopted a method in which he introduced certain definitions and postulates and later used these 'true' statements to derive many other results logically.

Euclid's first four postulates were considered obvious, seemingly valid assumptions that one had to make to move forward in studying geometry. However, the fifth postulate turned out to be a matter of debate and intrigue for hundreds of years. Take a look at its statement -

5. Let it be postulated that, if a straight line falling on two straight lines makes the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which are the angles less than the two right angles.



When the interior angles on the same side are precisely equal to two right angles (180°), the lines do not meet at all, which means they are parallel. Euclid's fifth postulate is also known as the parallel postulate since it can be used to prove the properties of parallel lines.

The objection was that postulates should be self-evident and intuitive. The parallel postulate was anything but simple and intuitive! It was difficult to comprehend and definitely did not look like something so obvious that we assume it to be true. Consequently, many mathematicians set out to prove (or disprove) the statement of the fifth 'postulate', using the first four postulates as the background. They tried for centuries but did not succeed.

However, during the early 19th century, mathematicians noticed something. They thought, why not see what happens if we just assume the fifth postulate to be false. Surprisingly, this assumption revealed new kinds of logically consistent geometries to them, ones in which Euclid's results did not hold. These geometries were developed by Riemann, Lobachevsky, Bolyai and Gauss. These non-Euclidean geometries, such as elliptical and hyperbolic geometry, opened up a new world of possibilities! Ultimately, the fifth postulate was put to rest when it was proved by Eugenio Beltrami in 1868 that the fifth postulate was independent of the first four postulates and, therefore, could not be proven from them. Thus, it had to be taken as a separate postulate.

Euclid is also called the 'father of geometry'. The advanced maths that Beltrami could use in his proof was not available to Euclid. Still, he somehow correctly stated his fifth statement as a 'postulate' rather than a 'theorem'. Wonder if Euclid knew all along that his fifth postulate was independent and could not be proven? Sounds unlikely. Even if he just assumed the independence of the fifth postulate, his work in the Elements paved the way to the development of geometries - Euclidean or otherwise!

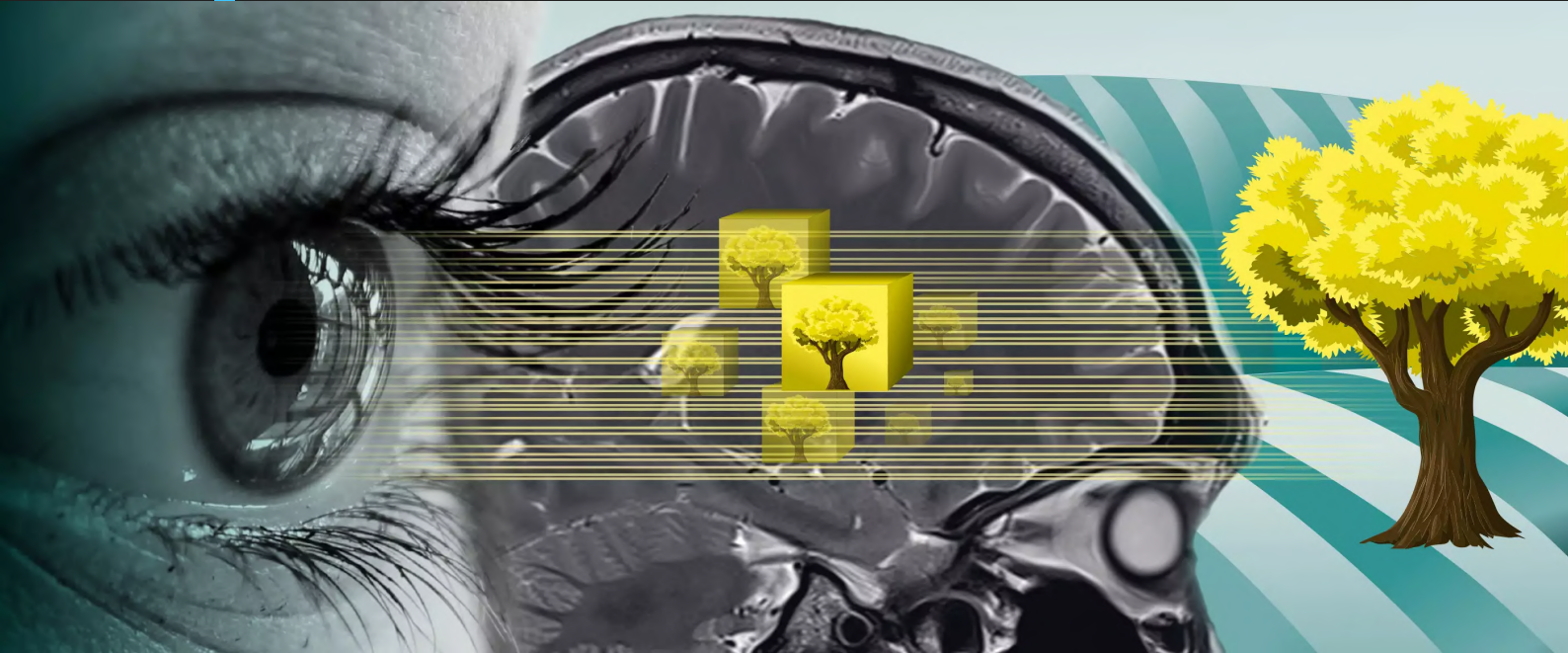
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DON'T ROLL THOSE EYES — YOU'RE BEING WATCHED!

BIOLOGY

by Anuradha Meena



Source: www.mpg.de

To view human behaviour is very important as it provides the skylight to human cognition and health. Not only this, but it is also crucial for functional magnetic resonance imaging (fMRI) studies. Researchers have developed AI to predict eye position and eye movement from MRI images. This method is fast and cost-effective and has scope in diagnostics of various diseases like neurological diseases (that often manifest due to eye movement).

Researchers have used an eye-tracker to keep track of eye movement - a sensor in which infrared light is projected onto the retina reflected and measured. Because the MRI has powerful magnetic fields, it needs MRI - compatible equipment to control its strength. The high cost of cameras and experimental efforts required to track eye movement is now easy because of MRI examination!

Now it is possible to view behaviour even without a camera during an MRI scan. The neural networks are used to detect a specific pattern in the MRI signal from the MRI scan. This is how we detect whether or not a person is looking. Here, Artificial Intelligence has a significant role as it helps us know which pattern to look for as a scientist. Recently, a group of scientists performed an experiment. They trained the neural network with pre-stored available data and then observed the participants' behaviour. This amazing experiment opens up many possibilities, for example, to study the gaze behaviour of participants and patients in existing MRI data, which were initially acquired without eye-tracking. In the same way, scientists could use the old data to find answers to the challenging problem.

This software can track when the eyes are open or closed. This opens up the opportunity to study participants when they are sleeping. For example, to track the movement of eyes during different sleep stages. The traditional eye-tracking camera is not much used as its accuracy calibration is cumbersome when we examine blind persons. This software enables a variety of applications in research and clinical practice.

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WHO ATE THE BABY? NO, WE'RE NOT TALKING ABOUT CANNIBALS!

by Jhanvee Khanna



Source: esudroff on Pixabay

Have you ever had your relative pinch your cheek so hard that they almost feel like being ripped apart? Or have you yourself felt the urge to squish a cute little puppy that you fear you may end up hurting it? Don't worry. There's a scientific backup to explain your actions. According to a 2014 Yale University report conducted in Psychological Science, people sometimes experience just too much emotion from seeing something adorable that they react in the opposite way you would anticipate. A "dimorphous expression" occurs when someone sees something cute and reacts aggressively. Aggression may be caused by people's inability to regulate the intensity of their reactions when they witness something really adorable.

Why would you want to eat the baby?

Johannes Frasnelli, a brain research professor at the University of Montreal, conducted a study in 2013 to determine why people believe newborn babies smell so good.

Researchers took pyjamas worn by newborns for a few weeks and handed them to two groups of women: new mothers and childless women. Researchers scanned the women's brains when they smelled the pyjamas. They discovered that both groups of women showed a high response in the reward and pleasure-related areas of the brain.

"We discovered an activation of reward-related brain areas in both moms and non-mothers," says the researcher, "Frasnelli said to ATTN: "Essentially, the same areas of the brain are active when you're eating your favourite food or smoker smoking cigarettes.

According to Frasnelli, it's an evolutionary adaptation that humans created to make them want to take care of their children: the child's scent evolved to pique a parent's curiosity, and the parent evolved to find it incredibly satisfying. It can be extremely overwhelming to care for a child, but nature has evolved a way to keep humanity intact by making child-rearing a rewarding experience.

So, we may have learned to appreciate cuteness as a result of our desire to care for children, even if we are occasionally overwhelmed, and newborn babies have learned to make us feel rewarded by generating fragrances that we find pleasing even if you don't want to devour them.

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CURD – THERE’S A CHEMISTRY LAB IN THERE!

by Aditya Bhattacharyya



Source: [Goumisao, CC BY-SA 4.0, via Wikimedia Commons](#)

Most of us are familiar with the curdling of milk (aka doodh phatna). Curdling is when milk changes from its usual white liquid state to a solid lumpy form for those who do not know. Milk that has been left outside for a couple of days gets spoiled due to curdling. This process can also happen and must be avoided in the preparation of milk-based sauces and custards. On the other hand, it is routinely used in households all over the country to prepare curd (aka dahi). It is also used to produce paneer and cheese from milk. Thus the curdling process holds an important place in the culinary world.

However, the science behind this apparently simple process is quite fascinating. So milk is essentially a mixture of several proteins, fats, and sugar molecules suspended in water. One such group of proteins are called caseins. Caseins possess a negatively charged phosphate at the end of their amino acid sequence. Consequently, the protein is amphiphilic and thus forms micellar clusters in an aqueous medium. The main protein polypeptide forms the hydrophobic core. At the same time, the negatively charged phosphate groups jut out of the surface of the micelle and interact with the water molecules. However, this makes the surface of these micelles intensely negative in charge, which prevents multiple such micelles from coming together. Consequently, these tiny, negatively charged micelles remain suspended in the water, resulting in milk attaining its liquid-like state.

However, upon adding acidic substances (like lemon juice), the pH of milk decreases. This leads to the protonation (i.e., the addition of H^+ ions) of the terminal phosphate groups in the casein micelles. Protonation neutralises the negative surface charge, resulting in reduced electrostatic repulsions between two micelles. Consequently, these micelles start aggregating together, giving rise to solid lumps. Eventually, the liquid consistency is replaced by solid lumps, and the whole milk is curdled.

Curdling can be induced by other factors apart from pH. The curdling of milk to form cheese employs an enzyme called rennet, originally extracted from mammalian intestines. Rennet breaks milk proteins into smaller fragments that wind up sticking together, leading to milk curdling. Other factors like temperature, humidity, etc., can also cause curdling of milk, albeit more slowly.

INSPIRON

GREGORY BLACKSTOCK



Joe Mabel on flickr



Joe Mabel, CC BY-SA 3.0, via Wikimedia Commons

Some feel that he can be super loud at times. Some may even say that he has no sense of empathy or can't read your face. He has problems with speech and communication with others. But 75 years old artist Gregory Blackstock couldn't care less.

01. BORN AUTISTIC

Gregory was born in 1946, long before people widely knew about autism. Although he came from a house with sufficient means, no one in his family knew how to take care of him. When they took him to a family doctor, he was misdiagnosed as "paranoid schizophrenic".

From age 10 to 15, he was sent to a distant boarding school for "troubled" children; the doctors hoped to make him "less robotic". In a documentary made on him, he remembers his experience there and says, "... I hated that... I wanted to be home!"

Later, of course, he was diagnosed with autism - the rarest end of the autism spectrum: Autistic Savant.





Joe Mabel, CC BY-SA 3.0, via Wikimedia Commons

02. EARNING AND DRAWING

Throughout most of his adult life, Gregory has earned and lived independently. He worked in many minimum wage jobs throughout the years, like as a newspaper carrier in his adolescence.

He later joined Washington Athletic Club as a dishwasher and worked there for 25 years. During that time, he started working more steadily on his art and amassed a considerable number of drawings. But, none of them got into the public eye for a long time.

He retired from his job at the club with a union pension, but unfortunately, his financial advisor was convicted of fraud. He could have easily lost all money and would have been homeless.

03. SUPPORTIVE COUSINS

Dorothy Frisch is the youngest cousin to Gregory Blackstock. Although first reluctant to help her cousin, who was not quite like others, she ultimately took up looking out for him. Gregory used to send her his work while he was still working at the club. And one day, a neighbour suggested to her that his artwork may have a broad audience.

This kind of art form is called "outsider art", which is artwork created by an artist who has never attended art school or doesn't belong to the "artist community". She decided to send some of his work to an art gallery and then just waited for a reply.

Of course, if you have read any story in your life, you'd know that no reply came. And so, she just left the matter altogether.

However, months later, she heard back from the gallery, which loved Gregory's work. In an interesting turn of events, the letter she had posted had got lost behind a cabinet. It was when they shifted their office that they finally noticed his work.

From there, it was a high road for Gregory.



Anne Grgich on flickr

04. ARTWORK AND RECOGNITION

In 2004, his work was finally recognised and exhibited across the world in art galleries. People began buying and collecting his work. Today, he is a known figure in Outsider Art. (To give a reference, Nek Chand's Rock Garden in Chandigarh is one of the most famous examples of Outsider Art.)

One look at his artwork will bring a particular word in the minds of the viewers: organised. He meticulously draws rows and rows of similar objects and keeps them labelled. Since he cannot use language to communicate with the world, he uses art to show what he has in his mind. It's his way of letting us into his world.

Finally living with his art today, Gregory is happy. He doesn't need to work menial jobs to survive anymore - his work sells for \$2000 - \$14,000 (around ₹1,50,000 - ₹10,50,000). He never gets bored and is always observing the world around him.

His is a classic story of perseverance. Even with no prospects of ever making it big, he went on doing what he loved the most - drawing.

ENDNOTES

Gregory Blackstock has been featured in magazines, documentaries, and various scholarly works. His many exhibitions have garnered praise from art critics across the world. A book with his artwork has been published, titled - Blackstock's Collection: The Drawings of an Artistic Savant.



Persons with disability day

A day in the life of Manasi

Interviewers: Asmi Gaikwad and
Atharva Valanju



A DAY IN THE LIFE OF MANASI

On the occasion of the International Day of Persons with Disabilities, team KNOWBEL is delighted to interview Manasi Sonsale, who has proved to the world that disability is not a shortcoming but indeed an ability to achieve your goals in life.

Manasi Sonsale, 20, has been hard of hearing since birth. But that does not stop her from pursuing her passion. Her hobbies include swimming, playing cricket, travelling, and trekking. She has a Bachelor's degree in Computers. She is also a professional badminton player with seven gold medals, most of them from National level championships. Mentioned below are some of her brilliant achievements:

MH Sports Council of Deaf

*7th MH State Games of Deaf Pune
Singles – 1st*

7th MH Badminton Championship the Deaf (A. Nagar)

*Singles – Runner Up
Mix Double – Runner Up
Women's Doubles – Winner*

9th MH Games of the Deaf State (PR)

*Women's Doubles – 1st
Mixed Doubles – 3rd
Singles – 3rd*

11th MH State Games of the Deaf (Kolhapur)

Singles – 1st (Jr)

21st National Games of the Deaf (Chennai)

MH Team – First

22nd National Games of the Deaf (Ranchi)

MH Team – 1st

VI National Deaf Junior and Sub Junior Sports Chennai

*Singles – 1st
Mixed Doubles – 1st
Team – 1st*

Havelitaluka Badminton Association (Pune)

U/16

Late Sou Sunita Barne Memorial Sub Junior State Level Badminton Tournament

Girls U/13

Amateur Badminton Club of the Deaf (Mumbai)

Singles – 1st

When did you realise that you wanted to pursue badminton professionally and what inspired you to carry on despite all the challenges you faced?

At the age of four, I started playing Badminton, and I joined the Coaching Institute when I was ten years old, the coach was also a deaf person, and at that time, I realised that if he could do it, I could also do it. So at that age, I realised I could look forward to playing badminton professionally.

Can you describe your journey — from not understanding anything to learning the language, being fluent in written English, and finally becoming a national level player?

When I was born, my complete family was deaf. The first language I learnt was sign language, and my mother tongue is Marathi. Slowly slowly, I started learning the English language and mostly practising. I learnt things from visuals, and also during my badminton practice, most of the communication I had was visual communication. Eventually, I learnt how to play badminton well.

People trying to focus often get disturbed by background noises. Did you ever feel that not hearing any background noise allows you to concentrate and focus even better while playing badminton?

It is a special thing for me because I can focus more when I play badminton because there is no distracting sound that I can hear. Compared to other people, I think that it helps me focus better.

It is often thought that people who have lost one sense have other heightened senses. Have you ever felt such a 'superpower' in sight or touch?

Being deaf, I feel like a superpower because though I've lost one sense of mine, I can still do many things like reading, hearing, smelling, and touching using my other senses. Therefore, I feel it's not difficult for me to learn anything. The journey of being a badminton player was smooth because it was easy to understand everything visually. Moreover, when I go to coaching classes, people in my surrounding also converse in sign language. So it is easy for me to communicate with everyone.

At the young age of 20, you are playing at a national level which is a proud moment for your teachers as well as your family. How do you feel about it?

I am very happy, and I feel like my life changed when I started playing nationals. I want to become a role model for all who are disabled and show them that being deaf isn't a disability but an ability. I want to tell them- don't hold back no matter what happens. My entire family is deaf. When my parents were small, there wasn't much education for deaf people. But now there are many opportunities for learning. Utilise them and move ahead in life.

What kind of poems do you prefer writing? What are the languages that you are most comfortable in? Is it primarily Hindi or English?

I would like to narrate an incident. I met with an accident 15 days prior to the Ranchi badminton tournament and got four stitches near my right foot. I was completely devastated as I had lost my hope to participate in the tournament. With the support of my parents and doctor, I was revived. Then I managed to reach the competition with a big bandage on my foot. It turned out that I ended up winning a gold medal for the same! That's what I want to convey: don't limit yourself. Be ready to accept challenges in life. For the purpose of communication, everyone should learn English. Also, there is a need to design the necessity for learning sign languages. Learning sign languages should be promoted in our society.

Indian Sign Language (ISL) is a communication enabler that truly makes social inclusion possible, be it sports or cultural exchange. Mainstream society needs to see the value of Deaf people's ISL, learn it from them, and promote it for true social inclusion.

A Polite Request From Manasi

I want to let you all know that deaf community members, including myself, prefer to be called 'Deaf' rather than different labels like 'Hearing Impaired', 'Hearing Handicapped' or 'Dumb/Mute'.

'Deaf individual' sounds respectable enough.
Thank you

(The answers were spoken on Manasi's behalf by her interpreter, Ms Anjali Rane)



~click by Vaibhav Ingale

The sky is a reminder that many things are possible even though they seem beyond our reach.

~Brandon Royal, The Little Red Writing Book



KNOWBEL

Send in the amazing photos clicked by you and we'll be happy to feature them in our magazine and on social media.

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