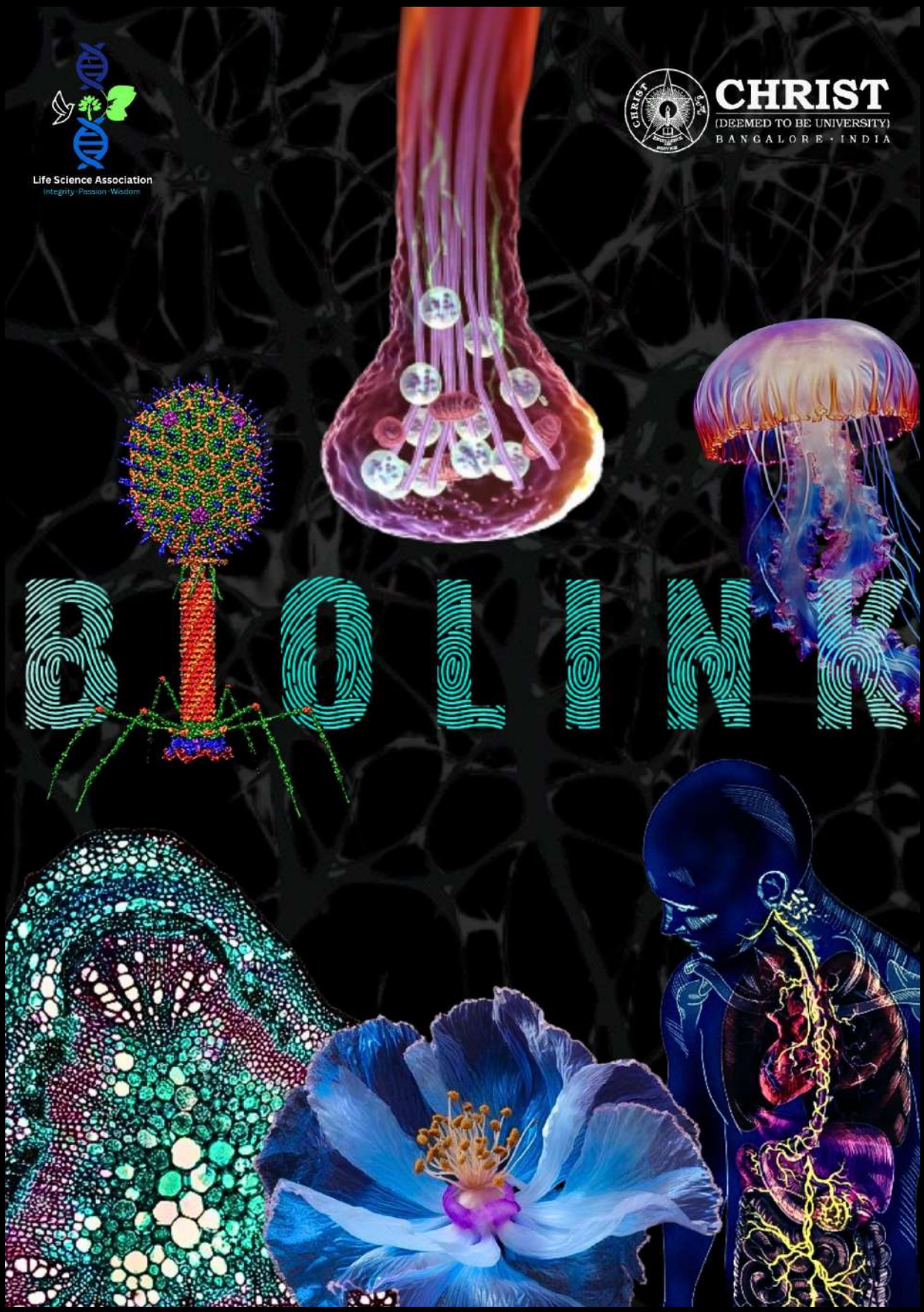
Life Science Association
Integrity · Passion · Wisdom

CHRIST
(DEEMED TO BE UNIVERSITY)
BANGALORE · INDIA



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Any artwork, images or photographs used in the magazine's overall design Google or Pinterest unless specified explicitly as an individual work of art.

Acknowledgement

We may, however, have never brought the "BioLink" project to life without the strong spirit of this amazing team. Our deepest regards go to each of them who participated in the journal by either submitting essays, poetry, artwork, or photos, which all contribute to different views in our journal.

We would like to express our gratitude towards Dr. Fr. Jobi Xavier, HOD, Department of Life Sciences and Dr. Arun K B, the faculty coordinator for their continuous help and support throughout this process. Lastly, a big thanks to Shashteshwarr.E, (4CBZ), Janani Kapaleeswaran (4BCZ), Kavya Arun (4BCZ), Mukunthaan (4BCZ) and Bhaveesh V. Shetty(4CBZ), for translating the interviews with our beloved lab assistants.

Finally, we would like to thank the design team for their uncompromising commitment that made our magazine a real product. Their creative and meticulous influence has brought the "BioLink'' project to the peak of its evolution.

We leave you with this thought:

"Science is not just a collection of facts; it is a search for truth and a journey of discovery."

Together, let us delve deeper into the marvels of Life Sciences, one engrossing edition at a time.

CONTENTS


12 Interview with the Unsung Heroes of Discovery


1 A message from the HOD


14 Block 1 Heroes


4 From the coordinator's desk


18 Block 2 Heroes

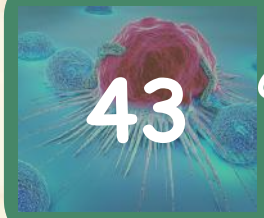

7 Editorial Note


21 R and D block Heroes


10 Editorial Board


23 Eyes and smile


11 Designer's Board


43 CAR- T Cell Therapy


25 20 Novels to Ignite Your Inner Genetics


46 The Fusion of a Black Hole and a Neutron Star


29 Naked Mole Rat- One of the only Eusocial Animal


49 Groot as Coastal Redwood


35 Botanical Chame leons:Alpine Plant


52 Proteomic Paradox: Unveiling the Hidden Pathogens


38 The Hobbit


55 Tamato Fever in Kids


41 Delve into the Deep

CONTENTS


70 Holding a Bit Tighter


71 The Moon


72 Birds Today


73 Beyond the Arranged Gate


75 Glory Days


58 Synthetic Mouse Embryo Using Sten Cells


61 Beware


64 Breathe


67 Enlightening of Trash

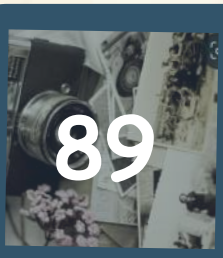

69 The House with a Brick Wall

CONTENTS


77 Come Sit With Me


79 Photography Column


84 Art Column


89 Archives of the Year

HOD'S DESK

from HOD's Desk

The foundational ethos of CHRIST (Deemed to be University), reflected in its core principles of "Excellence and Service," has consistently guided our students to realize their true aspirations and reach their zenith.

Since its establishment, the Department of Life Sciences has been steadfast in fostering the holistic development of its students.

As one of the institution's oldest departments, it has garnered a reputation for academic distinction and scholarly contributions. The Department has established itself as a beacon of excellence, emphasizing a multidisciplinary approach to teaching and research.

Beyond the walls of the classroom, it actively encourages its students to take up a vast array of co-curricular and extracurricular activities.

As is tradition, we are proud to present BioLink, the department magazine; an annual testament to the vibrancy and knowledge that the Department of Life Sciences holds.

BioLink features the latest advancements in Life Sciences, complemented by articles, poems, narratives, photography, and artwork, showcasing the department's expansive expertise and creative spirit. It is my firm belief that it will serve as an invaluable reservoir of knowledge and inspiration for students, faculty members, and the wider community alike.

I eagerly anticipate witnessing the continued evolution and triumphs of the Department of Life Sciences as it continues to exemplify the ideals of excellence and service.

Dr. Fr. Jobi Xavier
Head of Department
Department of Life Sciences

FACULTY

COORDINATOR'S DESK

from Faculty Coordinator's Desk

Greetings Christites!

I am thrilled to welcome you to the latest issue of the Department Magazine BioLink. The department's mission is to offer students a top-tier education and equip them for success in their chosen fields.
This magazine plays a crucial role in achieving that mission by highlighting the remarkable achievements of our faculty and students.

The department is dedicated to providing a world-class education to our students and conducting cutting-edge research that advances knowledge in the field of Life Sciences. This magazine is a testament to our commitment to excellence. We are grateful for your support in helping us achieve our goals. In this issue, you will find a range of articles that highlight the diverse talents and interests of our students and faculty.

As the faculty coordinator, I am excited to share with you the incredible articles, poetry, photography, and much more.
Last but not the least, I want to extend gratitude to our talented writers, editors, designers and all other contributors who have made this magazine possible. Without their hard work and dedication, we would not be able to share these stories and insights with you.

Thank you for reading. I hope you enjoy this issue of BioLink.

Dr. Arun KB
Faculty Coordinator
Department of Life Sciences

The Editor's Note

There is a perpetual buzz of discovery woven across all of life's complex tapestries, from the smallest cellular symphony to the enormous ecosystems that swarm around us.
It is within this spirit of exploration that we present to you the latest edition of BioLink,
the magazine of the Life Sciences department at CHRIST (Deemed to be University).

BioLink encompasses a diverse range of content that reflects the multifaceted interests and talents within the Department of Life Sciences. Within its pages, readers will find insightful articles delving into scientific topics such as evolution, emerging technologies, and pressing environmental issues like global warming. Complementing these scientific insights are touching poems exploring themes of love, self-discovery, loss, grief and beauty.
The magazine also showcases digital photographs capturing the splendor of nature and wildlife, alongside sketches that depict the vibrancy and talents of our student community. Readers can also explore a dedicated gallery of photos documenting the enriching experiences of the IMBIBE fest.

Additionally, the magazine has a special section featuring
insightful interviews with our lab assistants, offering a glimpse into the invaluable contributions of these unsung heroes of the Life Sciences department.
Being a part of this dynamic editorial team gave us the opportunity to connect our minds together to work towards the excellence of BioLink. The magazine committee actively participated in brainstorming sessions, problem-solving discussions, and engaging interviews - just a glimpse of the many tasks the team worked on. We also relished the chance of going through the amazing articles and poems that the talented students of our department contributed. Our journey as a part of the editorial team was a tapestry woven with creativity, collaboration and the vibrant voices of our fellow students.

Editing BioLink had an essence of its own. The magazine committee was really cheerful and
proactive, so it was a fun journey throughout. Although editing the articles and poems without changing their implications was indeed challenging. We received intriguing articles and beautiful poems and we have tried our best to edit them while maintaining their authenticity. We really do

encourage the students to exhibit more of their creative works through the magazine because it truly is an amazing platform to do so.
Through the experience of working on BioLink, we got the opportunity to learn more about our department. The submissions we received have demonstrated that the talent in our department extends beyond academics, and has brought to light the authors, poets and artists among us. The strength of our department truly lies in the mutual admiration and respect we have for each other.

Everybody, from the diligent lab assistants to the dedicated faculty, cooperate with and appreciate each other to bring the most fulfilling education to us students. All in all, being a part of the magazine committee has been a great learning experience for us!

The Editor's Squad

Dr. Fr. Jobi Xavier - Head of the Department
Dr. Arun KB - Faculty Coordinator, Biolink

STUDENT BODY

Vibek Kumar - 4CBZ
Sayanki Chatterjee - 4BCB
Sushree Sagarika Mishra - 4BCZ
Prisha Yadav - 4BCZ
Vartika Sahay - 4BCZ
Sharanya MG - 2BSc BtZ

The Designer's Squad

Dr. Fr. Jobi Xavier - Head of the Department
Dr. Arun KB - Faculty Coordinator, Biolink

STUDENT BODY

Krishnashish Das - 4BCB
Anoushka Banerjee - 4BCB
Adya Chauhan - 4BCB
Priyadharshini S - 4CBZ
Pammi Bhadra - 4BCZ

Interview with the Unsung Heroes of Discovery

Welcome to this special edition of the Life Science Department annual magazine, where we shine a spotlight on the unsung heroes of scientific discovery,

Our Lab Assistants!

We had the privilege of interviewing Raman Anna, Prakash Anna, Muthu Anna, Poovanan Anna, Rajesh Anna and Ravi Anna, the dedicated lab assistants who tirelessly support the research endeavours within our department. Through their meticulous work, expertise in equipment and protocols, and dedication to safety, they play a crucial role in driving scientific progress.

In this interview series, we delve into their experiences, motivations, and the unique challenges and rewards that come with supporting cutting-edge research in the field of life sciences.

Let's meet our brilliant lab assistants and gain insights into the crucial, yet often overlooked, world of laboratory support.

Block 1

Prakash Anna, Raman Anna & Muthu Anna in the frame.

Hero of the Botany Lab
Prakash Anna

Q. How many years have you been working in this lab? Which lab are you associated with?

Prakash anna: I've been working in the botany lab for 4 and a half years now.

Q. Can you tell us about your journey in this department for so many years?

Prakash anna: 2 years passed by in the covid phase and after that for the past two years I have been working here.

Hero of Biotech Lab
Raman Anna

Q. How many years have you been working in this lab? Which lab are you associated with?

Raman Anna: I've been working here for seven years now. The first two years in the botany lab and the last five years in the biotech lab.

Q. Can you tell us about your journey in this department for so many years?

Raman Anna: Ah! It has been so good. Botany was good, and now Biotechnology is going fine too.

Hero of Zoology Lab
Muthu Anna

Q. How many years have you been working in this lab? Which lab are you associated with?

Muthu Anna: 35 years. I joined Christ Junior College in 1989 and then moved to Christ University. I have done various tasks like gardening, and worked in the sports department too. But in the past few years, I have had health issues and that is why I have been assigned the lab assistant's job after talking to Fr. VC about it.

Q. Can you tell us about your journey in this department for so many years?

Muthu Anna: It's a good department. I've been working here for 6 years now, in the zoology lab.

Block 2

Ravi Anna & Rajesh Anna in the frame.

Hero of the MSc Lab
Rajesh Anna

Q. How many years have you worked in the lab?

Rajesh anna: I have been working here for the past 5 months as the lab assistant.

Q. Can you tell us about your journey in this department?

Rajesh anna: I have only been here for 5 months, but people are good here, they are training me well to take care of the lab. Students are giving us respect and helping us know more about Christ University.

Hero of the MSc Lab
Ravi Anna

Q. How many years have you worked in the lab?

Ravi anna: I have been working here for one year.

Q. Can you tell us about your journey in the lab so far?

Ravi anna: I give glassware and chemicals to students, and do reagent preparation for exams. I help out the staff with what they need as well.

R&D Block

Poovanan Anna in the frame.

Hero of The RnD Lab

Poovanan Anna

Q.How many years have you been working in this lab? Which lab are you associated with?

Poovanan Anna: I've been working since 2017 in this lab. Life sciences department lab. For BSc students' lab experiments and PhD students research.

Q. What makes the department a special place to work?

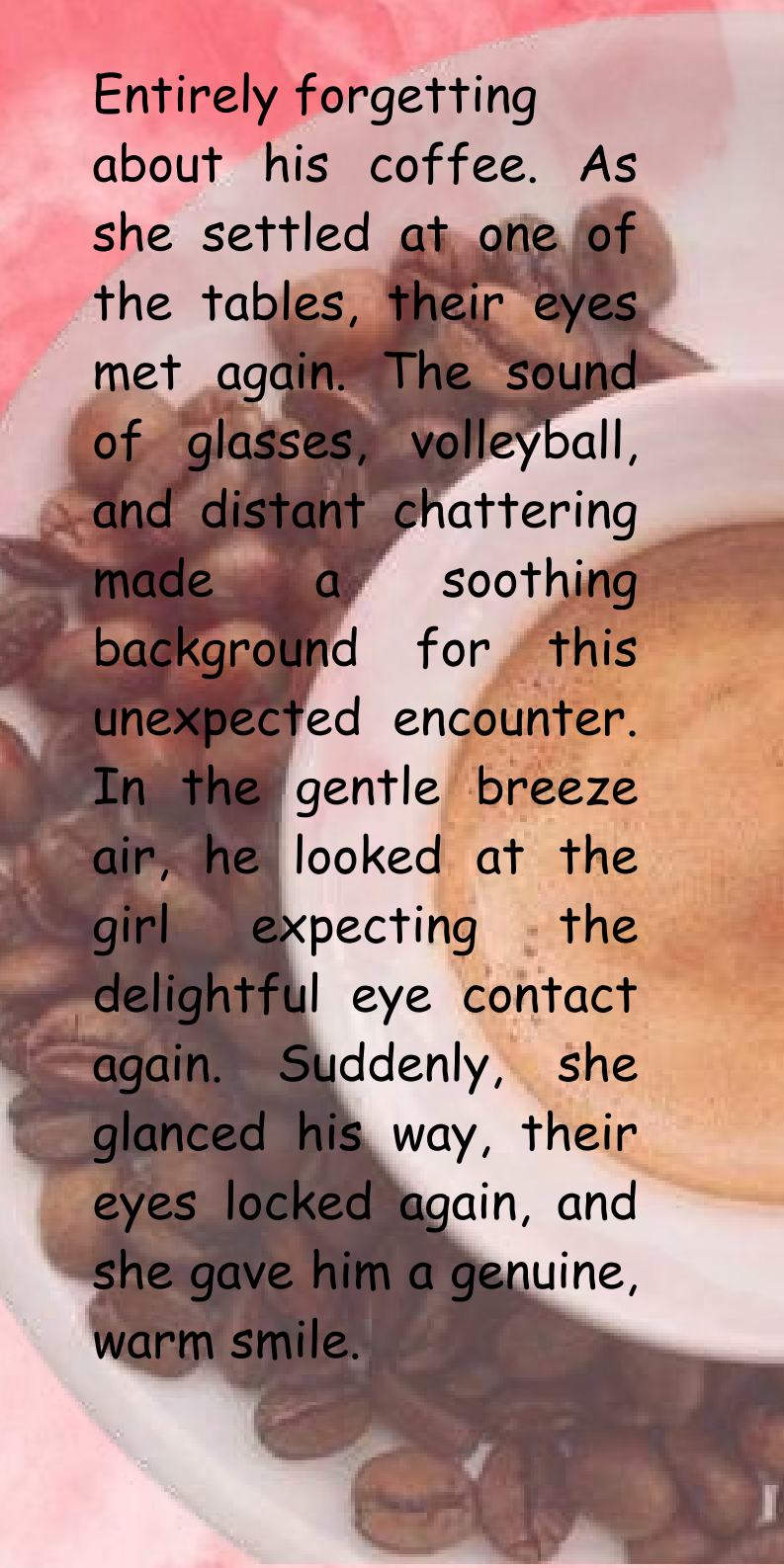
Poovanan Anna: All lab assistants are like friends in the lab. The people I work with make the place special. We help each other out. We don't have ego, we go to MSc labs and help and they come here and help. If someone is on leave or overloaded we help each other out.

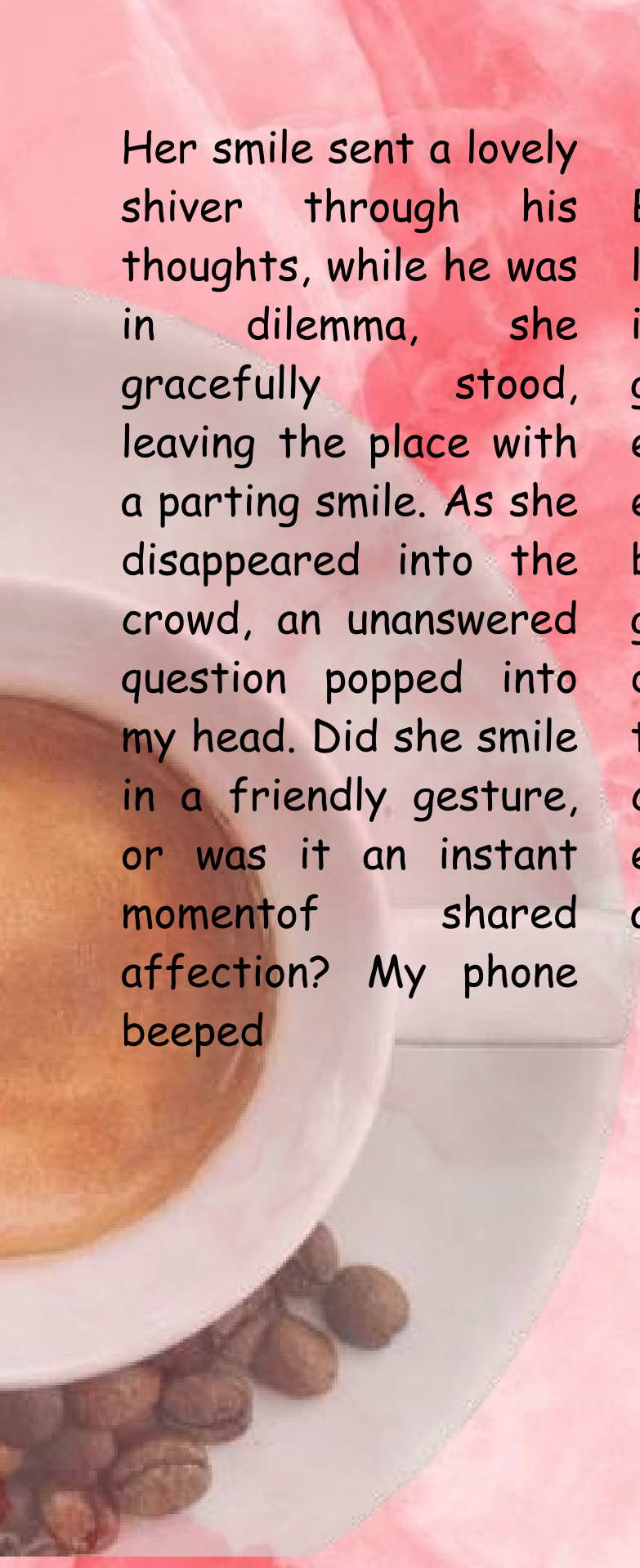

ARTICLES
COLUMN

Eyes and Smiles

In the lively ambiance of the Nandini cafeteria, he was captivated by laughter that rippled through the air. Turning his attention towards the sound, he noticed her. She was happily mimicking someone to her friends. Their eyes met briefly, he got tensed, but somehow, he offered a smile - a small smile. His eyes started to follow her movements,

Entirely forgetting about his coffee. As she settled at one of the tables, their eyes met again. The sound of glasses, volleyball, and distant chattering made a soothing background for this unexpected encounter. In the gentle breeze air, he looked at the girl expecting the delightful eye contact again. Suddenly, she glanced his way, their eyes locked again, and she gave him a genuine, warm smile.





Her smile sent a lovely shiver through his thoughts, while he was in dilemma, she gracefully stood, leaving the place with a parting smile. As she disappeared into the crowd, an unanswered question popped into my head. Did she smile in a friendly gesture, or was it an instant momentof shared affection? My phone beeped – MEETING AT 4 PM. Before leaving, I just looked at that boy; interestingly, he was gazing at another girl expecting delightful eye contact. The backdrop of clinking glasses, volleyballs, distant chatter, and the gentle breeze continued, witnessing endless eye contact and smiles.

Dr. Arun KB
Faculty Coordinator
Biolink

20 Novels to Ignite Your Inner Geneticist

A geneticist? Ah, that's a weaver of life's grand tapestry, a decoder of nature's hidden script. They speak the language of DNA, a symphony of nucleotides played on the strings of chromosomes. With keen eyes and nimble minds, they unravel the tangled threads of inheritance, tracing the whispers of ancestors in the echoes of our genes. Think of them as detectives, but instead of fingerprints, they follow trails of genetic markers leading to the heart of disease, the wellspring of potential, the mysteries of evolution.

They are artists and architects, crafting intricate maps of genetic landscapes, shaping new possibilities with the tools of biotechnology. Imagine them as storytellers, spinning tales of resilience and adaptation, of mutations that shaped the faces of humankind, and the delicate dance of genes dictating our destinies..They are the stewards of our future, whispering promises of cures for the old and solutions for the new.

So, dear inquirer, a geneticist is not just a scientist, but a poet of code, a sculptor of genes, a whisperer of life's secrets.

They are the ones who hold the key to unlocking the human story, one twisted strand at a time and don't you think to create one would require some motivation from a few story times?Here are twenty different tales to allure your creative minds and explore the field of genetics.

Thrillers & Mysteries:

1. The Gene Game by Jennifer Eagan: A geneticist's research into memory leads to a time-bending conspiracy and ethical dilemmas.
2. Double Helix by Nancy Kress: A scientist stumbles upon a hidden genetic
3. The Murder of Roger Ackroyd by Agatha Christie: A classic detective story
4. Sleeping Beauties by Stephen King: A mysterious plague throws women into an endless sleep, pushing science to its limits to find a cure.

Historical Fiction:

5. The Immortal Life of Henrietta Lacks by Rebecca Skloot: The true story of Henrietta Lacks, whose HeLa cells revolutionized medical research, raising ethical questions about ownership and consent.
6. Codebreaker by Walter Isaacson: The story of James Watson and Francis Crick, the race to discover the structure of DNA, and the ethical implications of their pioneering work.

7. Galileo's Daughter by Dava Sobel: A compelling fictional tale interwoven with the story of Galileo Galilei, exploring the clash between science and religion during the rise of genetics.

Science Fiction & Fantasy:

8. Gattaca by Neal Shusterman: In a dystopian future where genetics dictate your destiny, a young man defies his predetermined path to pursue his dreams.

9. World War Z by Max Brooks: A gripping zombie apocalypse tale with a strong emphasis on viral evolution and scientific solutions.

10.Octavia Butler's Legacy: Choose any of Octavia Butler's visionary novels exploring genetic manipulation, societal hierarchies, and the future of humanity, such as "Parable of the Sower," or "Patternist."

Young Adult Fiction:

11.The Gene Jumper by Nancy Farmer: A teenager with the ability to swap genetic traits embarks on a thrilling adventure through time and space.

12.Willa Cather's The Lost Lady: Though not directly about genetics, this classic novel explores themes of heredity and human potential through the life of a woman whose family carries a genetic secret.

13.Frankenstein by Mary Shelley: A cautionary tale about the dangers of tampering with genetics, still relevant in the age of gene editing.

Non-Fiction with Fictional Elements:

14.The Hot Zone by Richard Preston:

and dangers of resurrecting extinct species through genetic engineering.

This is just a starting point, and there are countless other novels that can inspire and inform aspiring geneticists. Choose from these diverse options based on your specific interests and explore the fascinating world of genetics through the lens of fiction!

Swasthika Nayak
4BCB
2240767

Naked Mole Rat- One of the only Eusocial Animal

Ahlada Sriya
4BCB
2240726

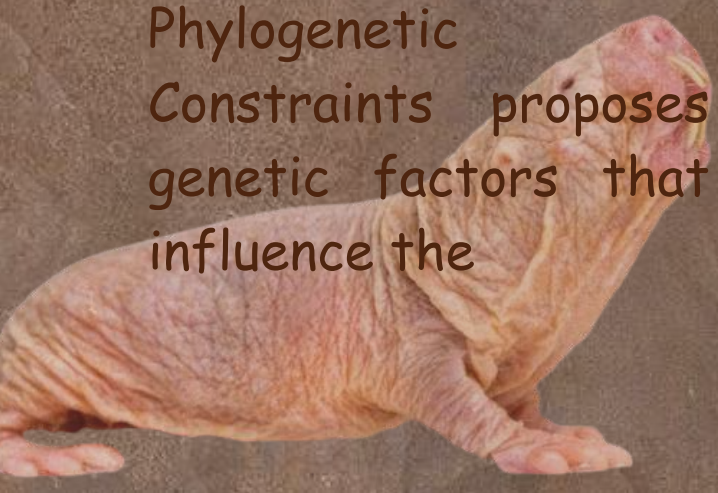
Eusociality is an elaborate form of social organization, involving a reproductive division of labour among members, overlapping generations, and cooperative care of the young. Some individuals reduce their lifetime reproductive potential to raise the offspring of others. Eusociality is common in hymenopteran insects and very rare in animals. One such animal is the naked mole rat.

Naked mole-rats are multicellular extremophilic, mouse-sized rodents, which are well-adapted to the harsh, hypoxic conditions commonly found below the ground.

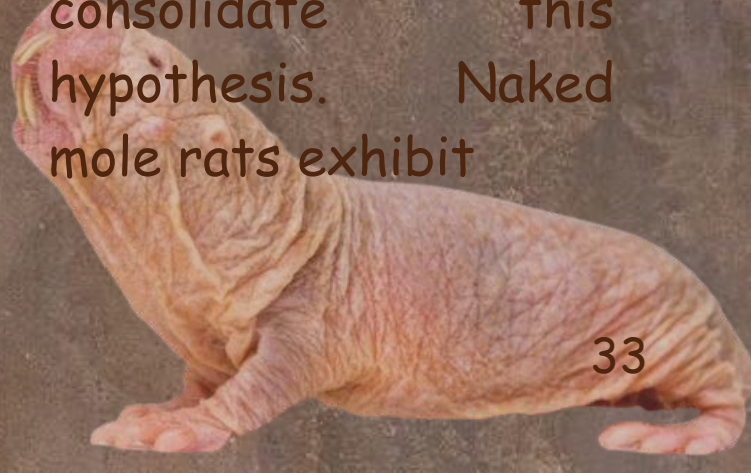
They form stable long-lasting colonies that are well maintained by communal activities of the subordinates, sacrificing their own reproductive fitness for the greater good of the colony. Although only the queen produces offspring and nurses the pups, all animals within the colony participate in childcare.

Considering their distinctive social structure, the eusocial nature of naked mole rats—as suggested by theories like the Predator Safety Hypothesis, Aridity Food Distribution Hypothesis (AFDH), and Hypothesis of Phylogenetic

Constraints—is investigated. The convergence patterns and evidence of territoriality and rivalry among underground mammals cast doubt on the Predator Safety Hypothesis, which holds that safety in the subterranean niche fosters eusocial tendencies. To further aid in our knowledge of the social organization of the species, the Hypothesis of Phylogenetic Constraints proposes genetic factors that influence the likelihood of eusocial behaviour in specific lineages. Naked mole rats exhibit monogamous behaviour, potentially influenced by increased social tolerance and aggregation, minimizing aggression for survival in challenging conditions The altruistic actions of weaned pups, who decide to remain and help with caring rather than going off to breed, are consistent with stable behaviours seen in cooperatively breeding mammals.



Additionally, the benefits of philopatry within colonies and the delayed dispersal of most offspring are explored, highlighting the intricate interaction between ecological, evolutionary, and behavioural factors that contribute to the eusociality seen in naked mole rats. To facilitate effective foraging, the AFDH expects colonies to get larger and individuals to get smaller. The hypothesis, however, is unable to differentiate between sociality as a requirement for survival and group living as a response to adverse circumstances. A comprehensive understanding of the intricate interaction between sociality and environmental conditions in naked mole rats is required, as is the necessity to consider regional variations and interpretive issues related to ecological aspects to further consolidate this hypothesis. Naked mole rats exhibit



remarkable behaviours associated with their eusocial lifestyle, suggesting intriguing aspects of intelligence. Despite initial suggestions that their environmental modifications, such as complex burrow systems, are instinctive and genetically predetermined, recent research highlights their surprising behavioural and cognitive flexibility.Unlike the rigid genetic determination proposed, mole rats display behaviours hinting at observational learning capabilities seen in mammals.

These include playful activities, especially among juveniles engaging in "play-fighting" and participating in social hierarchies.

Furthermore, naked mole rats demonstrate tool use, employing items like tuber husks or wood shavings during burrow excavation—a behaviour rarely observed in rodents

Their hygienic practices, including.

designated toilet chambers, showcase advanced cleanliness, surpassing certain human civilizations. Communication is another intelligent trait, with at least 18 distinct vocalizations conveying danger, anger, food, and mating desires, contributing to a semblance of language. Although their brains are relatively small, these behaviours suggest a remarkablecombinatio n of sociality, cognitive flexibility, and problem- solving abilities in naked mole rats.

The eusociality of naked mole rats explored through hypotheses like the AFDH, challenges traditional views. Recent research reveals unexpected cognitive flexibility and intelligent behaviour, highlighting the need for a nuanced understanding of their complex social structure. Playfulness, tool use, advanced hygiene, and intricate communication suggest a sophisticated form of eusociality in naked mole rats, contributing to the broader understanding of animal intelligence and social organization.

Botanical Chameleons: Alpine Plant's Heroic Evolution of Cryptic Camouflage

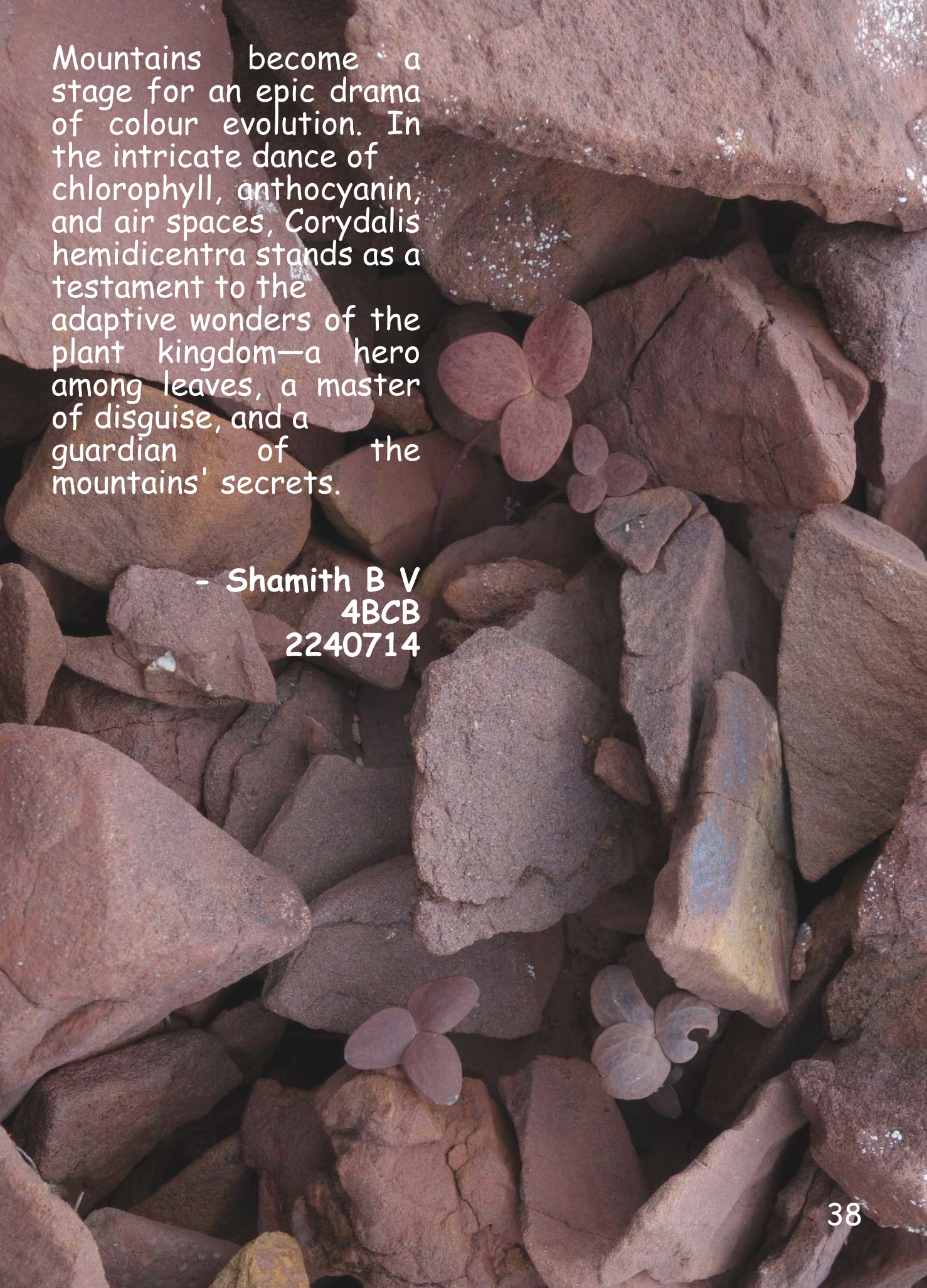
In the rugged landscapes of the Hengduan Mountains in southwest China, a seemingly self-effacing alpine plant, Corydalis hemidicentra (C. hemidicentra), has revealed a hidden talent: adaptive camouflage. The plant, known for its cryptic leaf colouration, has deftly evolved divergent hues across different populations, mirroring the surrounding rocks. This fascinating phenomenon,phenomenon, largely unexplored in the botanical world,suggests a superhero-like ability to optimise camouflage against visually foraging enemies, particularly the discerning Apollo butterflies.

To unravel the mysteries of this botanical chameleon, scientists embarked on a journey to five populations of C. hemidicentra, each nestled in distinct rocky environments. Employing a model based on the colour perception of the Apollo butterfly,the researchers unveiled a remarkable tale of local background matching. The leaves, varying from reddish-

brown to dark grey to greyish-green, displayed a superhero-like finesse, blending seamlessly with their native rocky habitats. Their colour diversity lies in a trio of pigments—chlorophyll, anthocyanin, and air spaces. Like a botanical superhero ensemble, these pigments combine forces to create a visual symphony of colours that camouflages the plant and showcases the marvels of evolutionary adaptation.In the eyes of their herbivorous adversaries, the butterfly overlords, the leaves' colours proved better suited to their native landscapes.This adaptive divergence highlights the superheroic strategy of local crypsis, where the plant populations have evolved to match their specific visual environments.

But the adventure doesn't end there. The superheroic qualities of *C. hemidicentra* extend beyond mere camouflage. The level of background matching correlates with the intensity of feeding risk—higher risk, better masking from its surroundings. In the world of plant-herbivore interactions, *C. hemidicentra* emerges as a botanical hero, finely tuned to the challenges of its environment.

As we unravel the tales of these botanical superheroes, the alpine screes of the Hengduan



Mountains become a stage for an epic drama of colour evolution. In the intricate dance of chlorophyll, anthocyanin, and air spaces, Corydalis hemidicentra stands as a testament to the adaptive wonders of the plant kingdom—a hero among leaves, a master of disguise, and a guardian of the mountains' secrets.

- Shamith B V
4BCB
2240714

The Hobbits

In a cavern known as Liang Bua, amidst the Indonesian expanse of Flores, a profound archaeological revelation shook the very foundations of our understanding of human evolution. It was September 2nd, 2003, when a team led by archaeologistThe Hobbits Mike Morwood, unearthed a startling find: a small skull, leg bones, and a few arm bones—a child, it was assumed. However, when the molars were examined, it was shown that the 'child' had fully developed adult teeth. Speculations ran wild. Arguments suggested that it could be be a modern human with microcephaly, Loron syndrome, etc Ibut nothing could quite describe the unique mix of archaic and modern traits found in the subject.

The three-foot tall, 25-kilogram skeleton (LB1) exhibited knee joints that hinted bipedalism, robust limb bones, short collar bones, and proportionally large feet. Dating back 50,000 years and coexisting with Sapiens and Neanderthals, it had a cranial capacity of only 417 cm3 (compared to Sapiens' 1400cm3

and Neanderthals' 1500cm3

). This sparked immense controversy. Eventually

Eventually, it was classified as a new species, Homo floresiensis, by Peter Brown.
The peculiar blend of archaic traits in this new species finds an explanation in the island rule.
This principle suggests that smaller islands and greater distance from the mainland result in more unconventional species. When a species migrates to an island, isolation over extended periods creates a markedly distinct environment. Unique resources, altered species interactions, and reduced competition prompt evolutionary shifts. shifts. Thus, over generations, the species evolve, and their dynamics become drastically different from those on the mainland.

Along with H.floresiensis, there lived giant six-foot storks (Leptoptilos robustus), smaller dwarf Stegodon relatives (650 pounds), and Komodo Dragons that still exist today.
The presence of cut marks on the fossils of dwarf Stegodon indicates that Homo floresiensis likely consumed these creatures. Additionally, the discovery of burned Stegodon bones suggests the possible use of fire by them. Alongside these findings, remnants of basic stone tools like cores, flakes, and points were found, indicating their use in hunting or processing plant materials. These intriguing discoveries shed light on the dietary habits, potential,

prowess, and resource utilization of the enigmatic Homo floresiensis. The decrease in both brain capacity and body size among the hobbits might represent an evolutionary adaptation. Initially puzzling, this phenomenon aligns with the island rule. Limited resources on the island made meeting energy demands challenging. Consequently, it became practical to decrease both body size and the energy-expensive nervous tissue. This case reaffirms that evolution lacks an end goal, such as maximizing intelligence or size. Its sole purpose remains facilitating survival in the prevailing conditions.

The evolutionary origins of the hobbits remain ambiguous. The prevailing theory suggests they could be a dwarfed version of Homo erectus, yet this idea faces challenges. Some scientists contest this view, claiming Homo floresiensis are too primitive to have evolved directly from Homo erectus. These speculations rest on uncertain ground. However, one undeniable outcome of this discovery is that there are many chapters of human history waiting to be unravelled.

CHETHAN RAM M
2240777
4BCB

Delve into the Deep

Life in the deep oceans is largely unexplored. The harsh and unusual conditions of the ocean, like the incredibly high pressure and lack of a light source, have caused some interesting life forms to evolve. Let us delve into seven interesting facts about the ocean!

1. It is hard to estimate how many species could exist in the deep ocean, marine biologists have guessed that it could range from 500,000 to 10 million species!

remnants of extinct volcanoes.

2.There are mountains in the ocean too! They are called seamounts and are usually Mauna Kea in Hawaii is the second highest peak to be located on an island, and it is in fact a seamount! Its total height (which includes its height above and below sea level) is 10,210 metres. That makes it taller than even

Mount Everest! 4. There could be around 100,000 seamounts in the oceans.
5. More than half of known coral species live in the deep ocean and can survive in the temperature of -2°C and withstand a pressure of around 480 atmospheres!
6. These deep sea corals and sponges are thought to be amazing untapped sources of natural products like pharmaceuticals and cosmetics. 7. To quantify how many species live in deep oceans, scientists have estimated that 98% of all of the ocean's species live in, on, or just above the ocean's floor!

Vartika Sahay
4BCZ
2240686

CAR (Not the one with Wheels) - T Cell Therapy

It is no secret that Cancer is one of the most dreaded diseases worldwide, and because of this, a number of treatments have been developed in the course of time. One such branch of method of treatment is immunotherapy, which utilizes and enhances the normal capacity of the patient's immune system. It strengthens the power of a patient's immune system to attack tumours and has rapidly become the "fifth pillar" of cancer treatment. Immune system-boosting drugs can shrink and even eradicate tumours. Drugs called immune checkpoint inhibitors are drugs that prevent the binding of certain proteins on immune cells with proteins on other cells like cancer cells, this binding often stops the immune system from destroying the cancer which is why these drugs are needed.

Delving a little bit deeper, an example of immunotherapy is CAR T-cell therapy, which is what I will be discussing here.

CAR T-cell therapy stands for Chimeric Antigen Receptor and it essentially involves the genetic modification of a patient's autologous autologous T-cells to express a certain receptor on their surfaces (CAR)

that is meant for a tumour antigen. Once the cells have been modified, they are multiplied and then re-introduced into the patient's bloodstream. CARs are fusion proteins (made up of 2 or more domains encoded by different genes that are fused together). The modification is done by various methods; it can be done by viral or non-viral methods like CRISPR-Cas9 technology or direct transfer of in vitro transcribed-mRNA by electroporation.

CAR T-cell therapy is not as widely used as immune checkpoint inhibitors but they too have the ability to work against leukemia, lymphoma, and to keep the cancer at bay for several years. Since 2017, the Food and Drug Administration (FDA) have approved 6 CAR T-cell therapies. They have been approved for the treatment of blood cancers such as multiple myeloma. However, cost seems to be an issue as the most recently approved therapy is more than $450,000. Currently available CAR T-cell therapies are customized for each individual patient. But, like in all treatments, it can cause severe side effects, cytokine release syndrome (CRS) being one of them. T cells release cytokines, chemical messengers that help stimulate and direct the immune response, so in the case of CRS, T cells flood the bloodstream with cytokines, causing serious side effects like dangerously high fevers and drops in blood pressure.

CRS can be fatal. Mild CRS can be managed with standard supportive therapies including steroids and researchers have discovered new ways to better manage more serious cases of

CRS. Other side effects can include neurologic effects- severe confusion, seizure-
like activity, and impaired speech.

2
Despite the aforementioned side effects, CAR T-cell therapy has a lot of potential
and a lot of scientists are researching more into it, and gaining more experience
in this field.

Ishita Lal
2BScBtZ
2340628

The Fusion of a Black Hole and a Neutron Star

Within the vast expanse of the universe, celestial bodies engage in a captivating and often turbulent dance, shaping the cosmos and unveiling its fundamental intricacies. Among these cosmic performances, the merger of a black hole and a neutron star stands out, a phenomenon observed through the detection of gravitational waves by the Laser Interferometer Gravitational-Wave Observatory (LIGO) and the Virgo detector in January 2022. This event not only confirms the predictions of Einstein's theory of general relativity but also provides astronomers with a unique opportunity to delve into the extreme physics governing the universe's most enigmatic phenomena.

Black holes, regions where gravity is so intense that even light cannot escape, and neutron stars, the collapsed remnants of massive stars composed primarily of densely packed neutrons represent two of the uthe universe's most extreme environments. When these celestial giants merge, they unleash a cataclysmic release of energy in the form of gravitational waves.

The resulting kilonova provides astronomers with invaluable insights into the characteristics of these celestial bodies, including their masses, spins, and the intricate dynamics of their interaction. By analyzing the gravitational wave signal, scientists can reconstruct the events leading up to and following the merger, providing crucial information about the formation and evolution of compact objects in the cosmos.

Furthermore, the detection of kilonovae contributes significantly to our understanding of the cosmic processes shaping the universe, from the birth and demise of stars to the distribution of matter across cosmic scales. Through the study of these phenomena, astronomers gain deeper insights into the fundamental properties of the universe and its evolution over billions of years. In essence, the fusion of a black hole and a neutron tar represents a captivating cosmic spectacle that not only illuminates the extreme physics governing the universe but also reaffirms our understanding of its underlying laws. Through the detection of gravitational waves, astronomers continue to unravel the mysteries of the cosmos, revealing its beauty and complexity in all its glory.

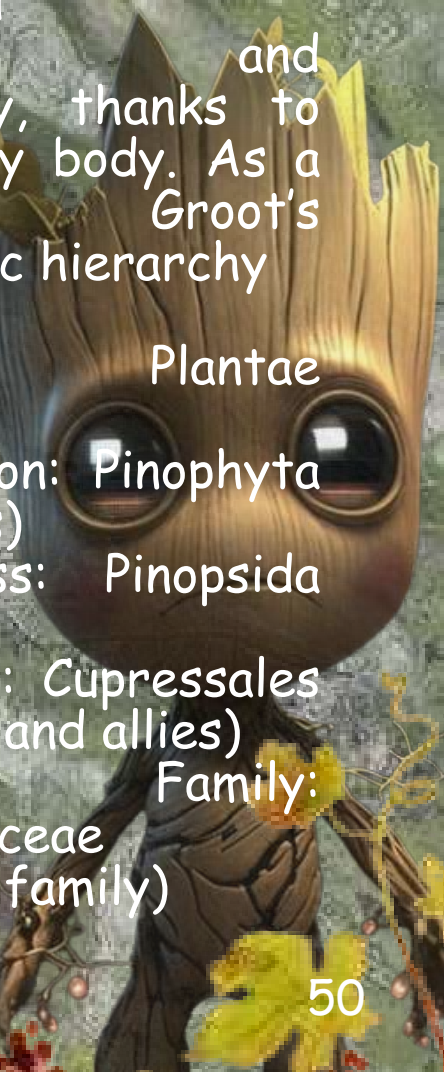
Adya Chauhan
2240771
4BCB

Groot as Coastal Redwood

"I am Groot" - the iconic catchphrase of Marvel Universe's famous character Groot is instantly recognisable. Groot's unique characteristics and endearing personality have made him a fan favorite. Created by Stan Lee, Larry Lieber, and Jack Kirby, Groot first appeared in Tales to Astonish #13 (1960) as an antagonist, but later evolved into a more complex and heroic character. He hails from Planet X, the capital of the Branch Worlds, and belongs to the species Flora Colossus.What if Groot was an actual tree on Planet Earth. On the contrary to Planet X where he belonged to Flora Colossus, Groot would have probably been a giant redwood on Planet Earth, towering over other trees with his size and wisdom. Like real trees, Groot could photosynthesize, generating his own energy from sunlight. He might also have enhanced strength and durability, thanks to his woody body. As a redwood, Groot's taxonomic hierarchy would be:

Kingdom: Plantae (Plants)

- Division: Pinophyta (Conifers)
- Class: Pinopsida (Pinoids)
- Order: Cupressales (Cypress and allies)
- Family: Cupressaceae (Cypress family)



Subfamily: Sequoioideae (Redwood subfamily)

- Genus: Sequoia
- Species: Sequoia sempervirens

The vegetative characteristics of redwood are:

- Complex root system consisting of both shallow lateral roots that spread widely near the surface and deep taproots that can reach down 60 feet or more. This unique system helps the trees anchor themselves in the often windy coastal environment and access water from deep underground sources. Massive, columnar trunk with a thick, fibrous bark. The wood is relatively soft and lightweight, despite the tree's immense size. This is due to the large proportion of parenchyma tissue, which helps with water transport and storage.
- Small, scale-like, and evergreen leaves. They are arranged in opposite pairs along the shoots and tightly pressed against the stem. This compact arrangement helps to reduce water loss in the dry summers and windy conditions.

The reproductive characteristics of redwood are:

- Unlike most flowering plants, coastal redwoods do not produce flowers or fruits. They reproduce through cones, which are small and inconspicuous, borne on separate male and female trees. Male cones: Male cones are about 0.5 inches long and grow in clusters near the ends of branches. They produce pollen that is carried by the wind to female cones.

Female cones: Female cones are about 1-2 inches long and grow singly near the ends of branches. They contain ovules that are fertilized by pollen. After fertilization, the cones mature and release seeds the following year.

Towering over other redwoods, Groot would be a magnificent landmark, drawing awe and respect from anyone who witnessed his size and age.He could act as a beacon for other flora and fauna, offering shelter and resources, becoming a central figure in the forest's community.As a redwood, Groot's connection to the Earth would be even deeper. He could sense the whispers of the wind, the flow of water underground, and the heartbeat of the entire forest.He could communicate with other plants through complex root networks, sharing information and warnings of potential threats.He could become a symbol of environmental protection, inspiring others to care for the planet and its delicate ecosystems.

Sayanki Chatterjee
2240761,4BCB

"Proteomic Paradox: Unveiling the Hidden Pathogens"

Eat, sleep, wake up, run to the lab, conduct assays,record outputs, meet professors, take classes, evaluate assignments, repeat: life as a PhD scholar seems to be coming to a happy and fruitful end for Priya Devi, a research scholar under the department of biochemistry in the internationally acclaimed APJ institute of molecular sciences, well hidden in the deep forests of the western ghats of Tamil Nadu. One of the nation's most prestigious research institutions, Priya had been the talk of the town when her research proposal had been selected by this famous but secretive institution situated in the podhigai hills (as locals would call it). Huge campus, dormitories, a 24-hour-open dining hall with a variety of food options, well equipped labs with equipment, this place was a scientist's dream and she got to live the dream.

Her research involved proteomic studies of various pathogenic virus strains, including the recent pandemic causing virus strains of Sars-Cov-2 virus. During her time at the institution, she achieved remarkable findings- protein

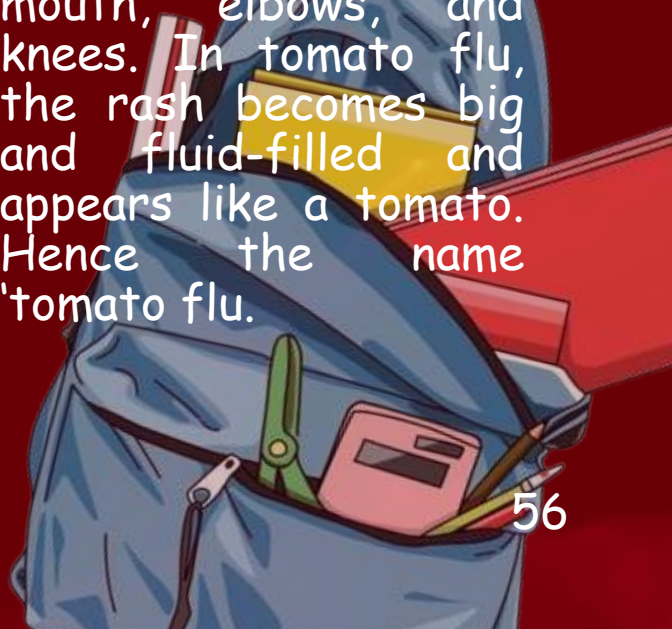
markers were formulated. Among the results she had attained initially, she found something very intriguing- several of the protein markers that has now been found and utilised were also seen as potential choices in previously published articles but were dismissed later, without no apparent reason mentioned in said articles. Upon further research, she finds out a few deleted articles that did mention most of those markers but was unable to find out the reason of deletion of the article. Upon continuing her research with more assays, she encounters multiple difficulties, where her cell analysis seems to be showing abnormally different results. Upon investigation, she finds her cells contaminated with a new and highly mutated virus, which seems to be highly pathogenic and resistant to most antiviral agents. While Priya's professor and supervisor had anticipated a potential mutation, this was highly unexpected even to a highly experienced person such as himself. While the pathogen was kept under strict isolation, news about this research leaked to the public media and there was panic and uproar at small villages surrounding the institution. Word of the situation slowly reached Dr. Seshagopalan, a retired biochemist with worldly experience on viral research, who decided to jump in and guide everyone to safety. He personally guided Priya on most of the important procedures involving altering the viral

proteomes, which solved the problem, calmed down public uproar, and provided a very valuable paper on usage of protein markers on virus to create vaccines and provide the cue for viral diseases. The scientific world was ecstatic upon the return of Dr. Seshan, and critically acclaimed Priya's thesis and research paper, while preparing to tackle diseases with the new medicinal weapons in their armoury-where our scientists were masterminds and warriors in one.

Tomato Fever in kids

While the reopening of schools has brought back normalcy in kids' lives, a new virus causing tomato flu or tomato fever has generated serious concerns among health watchers. This is an infection that is giving parents sleepless nights as it is said to be highly contagious. Early symptoms of tomato fever "There is no characteristic symptom or sign which differentiates tomato flu from other types of flu. For doctors, there is no specific clinical or lab test which can be ordered to confirm the diagnosis but having a high 'index of suspicion' helps," opines a renowned child specialist at Symbiosis Hospital, Mumbai.

Drooling of saliva from the mouth due to ulcers, and rashes on palms of hand, mouth, buttocks, and soles of feet, usually preceded by high-grade fever and intense body pain, are seemingly the tell-tale signs of tomato flu. The appearance of a rash is a sure sign of tomato fever. But is tomato fever just another name for hand, foot, and mouth disease(HFMD)? The rash in HFMD looks different- It is pin-point sized, fluid-filled and appears around the mouth, elbows, and knees. In tomato flu, the rash becomes big and fluid-filled and appears like a tomato. Hence the name 'tomato flu.



How to stop its spread Tomato flu is highly contagious in children, and so they should avoid contact with those who have tomato fever. Any infected child should be isolated at home till the fever subsides, the rashes dry up, and there are no rashes appearing. The infected child should not be allowed to share food, clothes, toys, etc with other non-infected children. Cleanliness of surrounding and regular sanitation should be ensured. Treatment Though there is no need to administer anti-virals or antibiotics to combat the infection, mouth ulcers can be treated with cream or gel containing lignocaine and acetylsalicylic acid. Likewise, fever can also be treated with paracetamol or equivalent drugs after proper consultation with a physician. Experts, however, urge parents not to worry much as tomato flu is a self-limiting infectious disease and its signs and symptoms resolve after a few days.

Gautam Prakash
Reg No: 2147706
Class: 3 MBTY

SYNTHETIC MOUSE EMBRYOS USING STEM CELLS

With an egg and sperm, the creation of life is easy peasy. Its just the matter of time. But an alternate approach was described in recent publication. Stem cells under ideal condition have the ability to proliferate and self-organize into an embryo by their own. Surprisingly two organisations reported their success in growing synthetic mouse embryos for longer than ever before in research. The studies were published in the journals Cell and Nature. Like other embryos, these synthetic embryos derived from stem cells developed different organs, such as a beating heart, a digestive tube, and even neural folds throughout the course of 8.5 days of growth.

The process is far from being described as quintessential since many of the cells do not develop these characters and those which develop will not mimic normal embryo. But this discovery represents a major headway in research for scientists in organ development.Jianping Fu, a bioengineer at the University of Michigan in Ann Arbor says

"The next milestone in this field very likely will be a synthetic stem-cell based human embryo," Developmental and stem cell scientist Magdalena Zernicka-Goetz has been working on this topic for ten years in her labs at the California Institute of Technology in Pasadena and the University of Cambridge, UK. Initially they used embryonic stem cells that can induce early stages of development. Then, a few years ago, her team found that their embryos continued to develop when they added stem cells that give rise to the placenta and yolk sac.They demonstrated that they could culture embryos using this method up to day 7 last year. In their most recent work, Zernicka-team Goetz's explains how they developed embryos which can survive for 8.5 days. Zernicka-Goetz's team came up with these results using the technique developed by Jacob Hanna, a stem-cell biologist at the Weizmann Institute of Science in Israel. They had created a tool that allowed them to culture natural mouse embryos for an unprecedented time outside the uterus. The embryos were kept alive in this incubator from 5 to 11 days.Compared to actual embryos made from sperm and eggs, these artificial models have significant benefits for researchers. They are much simpler to examine because they develop outside of the uterus. s. Additionally, utilising genome-editing

technologies, they are simpler to modify. Every single mouse or human gene may be altered or knocked out. They may be helpful in determining how certain genes contribute to developmental or birth abnormalities. But it won't be simple to extend this work into humans. it is highly technically demanding. But implementing them is not far from future. Also, there are some ethical concerns regarding human embryos. However, this discovery has marked a major milestone in the research world

-Arlin Philip Man

Beware

The word 'Environmental Sustainability' brings in different ideas and thoughts to your mind. Can it be summed up in terms such Reduce, Reuse, Recycle or being "Environmentally Friendly"? I don't think so. Environmental sustainability transcends above all the terms. This definition by Sphera is quite interesting - "Environmental sustainability is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future". When the term responsibility comes into play, it becomes a tedious task. It's very easy to shift the entire burden of being sustainable to the Government and Non-Governmental organizations. But that isn't the responsibility being spoken about here, it the effort each human being puts in to create a better living environment.

How do we create a better environment, when the present one is already damaged and destroyed? The answer is simple - by not doing any further harm. My main area of interest is plastic and microplastics. One glance at our room or labs and we can name a hundred different things made up of plastic. Plastic is one of the major environmental pollutants. To add more sorrow to our woes we have microplastics and nano-plastics in the picture as well. Microplastics are

smaller pieces / fragments of plastics that measure less than 5 mm in size. Primary microplastics are manufactured as such, and are a part of several beauty and cosmetic products. Secondary microplastics arise by the fragmentation/ degradation of bigger plastics. But, the main precursor for all these problems is plastic itself.

The vast majority of the pens we write with, the bottles we drink from, the plates we eat from and several daily use objects and products are all made up of plastic. So, is the answer to all these problems throwing out every bit of plastic we own? It's a big NO! At the beginning I wrote three words which are not a solution in their entirety but are definitely a part of it. We can reduce our plastic consumption, keep reusing the reusables, and making sure we recycle the materials, rather than dumping them.

So, now you might ask do I follow these? Yes, I have started to, and I must say it has been one the most challenging and complicated tasks I have undertaken. The first change me and some of my friends undertook was to bring to our own mugs for our everyday trip to Nandhini. In a recent study conducted at the Indian Institute of Technology Kharagpur, it was found that the disposable paper cups which have an interior plastic lining leach up to 25,000 microplastics, when a hot liquid is allowed

to sit in it for 15 minutes. So dear folks, please get a mug and remember on an average you can save the usage of 7-10 disposable cups per week.

It's alright to wonder if small steps can serve any change. Remember these lines from the famous poem 'Little Things' written by Julia Carney written in 1845:

"Little drops of water
Little grains of sand,
Make the mighty ocean,
And the pleasant land."

So, every step we take and make, can bring about a drastic change and when that idea gets shared among peers, it turns into the sustainable development we talk about. Be conscious of the choices you make, be mindful of the environment you live in. CHRIST university is already on that path and is an environment friendly campus. With initiatives like Parivarthana, and bins to drop electronic waste, they have paved the way for you to follow, in case you need direction. It's very delightful to see designated garbage bins for wet and dry waste throughout the campus. We don't have to search for places to start, we are all studying in such an environment. I titled this article "Beware" as it serves as a statuary warning as well as tells us to Be Aware of the choices we make. So, I encourage you all to begin where you are at. Be the first to take an initiative, and bring about a change, for a healthy environment supports healthy living.

Irene Monica J.
Ph.D. Research Scholal
2170189
Department of Life Sciences

Breathe

TWe live in an ever-changing world where we all are part of the global rat race. We are constantly running towards something, be it a goal, a deadline or a commitment. Our minds are now trained to be in a constant state of pacing and panicking. Once we finish a thing, we are already behind other things that are to be worked on. When was the last time you watched a movie in full, enjoyed a song, did a craft or even see the simpler things of life? When did you last see a sunrise or sunset, enjoy the beautiful shades of the evening sky, the gentle passage of clouds, the sway of the leaves to the rhythm of the wind or even stay in silence and embrace a moment of peace and l life we have?

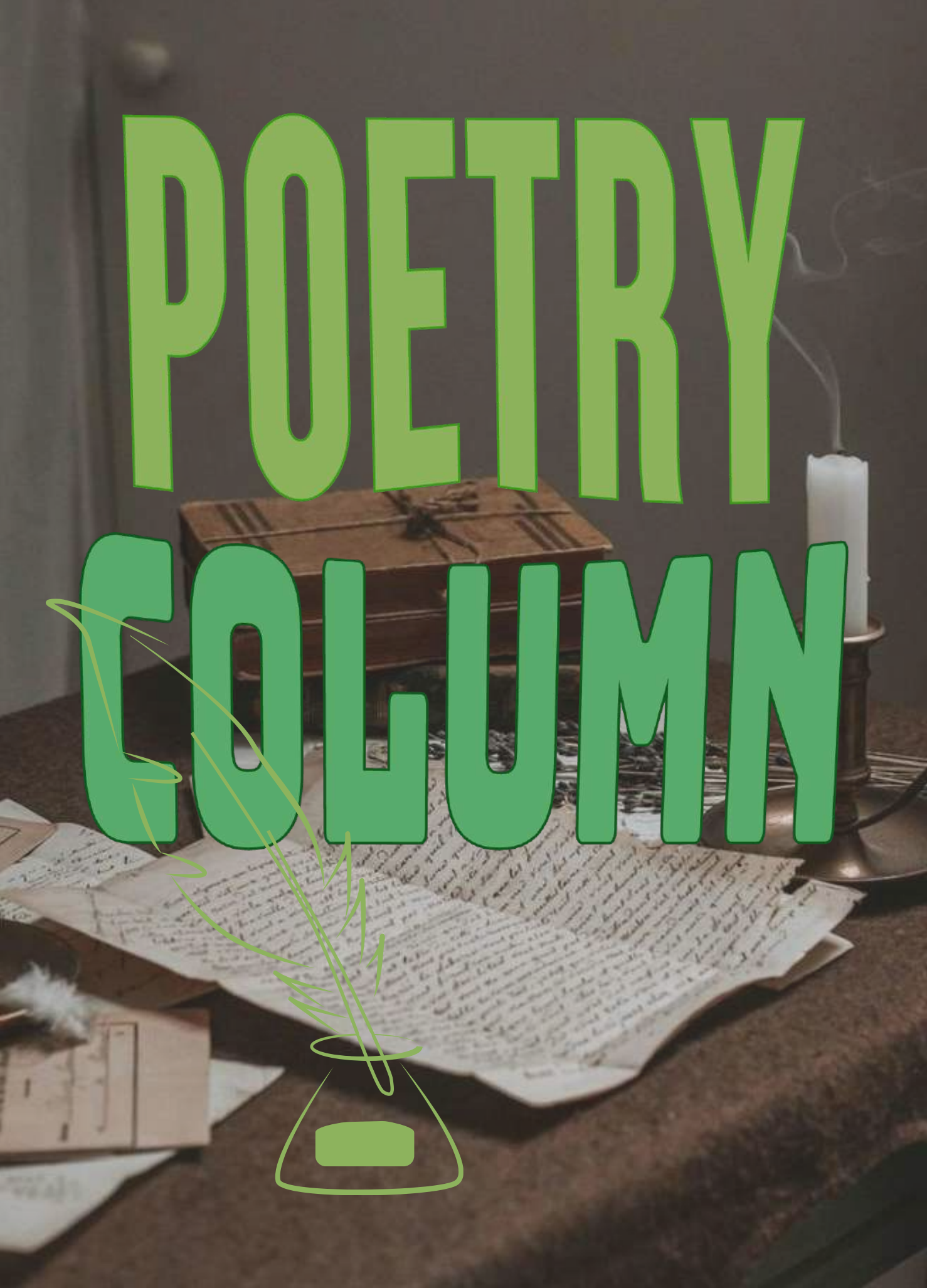
calm. Don't you feel that we are going too fast, that we have forgotten to cherish this beautiful beautiful life we have?

Christ (Deemed to be University) has the best campus I have seen so far. It's situated right at the heart of the Garden City, Bangalore. The campus has a variety of flora and fauna, a setting that sets it apart from other concrete jungles. I get very excited when the gardeners work in full swing, changing the plants that bloom for each season. The variety, the colours, the shape, the fragrance of each flower is unique and gorgeous. Do you even notice that they keep changing plants to

ensure that we are always surrounded by blooming plants? I see students engrossed in their phones, that they do not even take a minute to look up and enjoy this beautiful scene around them. We have become so materialistic that we are not aware of our surroundings.

With each passing generation, the appreciation for nature reduces. We have forgotten to live in reality and dream of some unseen future. The environment around us is the very reason we survive. We make use of all nature's resources, but are we giving back. We are so used to running in circles, stuck to a routine, that we deny ourselves a break at time. It's high time we stop this! We need to reorganize our priorities, calm our inner selves, pace ourselves for upcoming challenges and get started with renewed energy. So, all of you learn to do it one step at a time. It's time to breathe! Next time, you go to Nandhini, don't just focus on the coffee, take a moment to look at the marvellous bougainvillea that has grown intertwined with the silver oak tree, enjoy the breeze and just BREATHE!

Irene Monica J.
Ph.D. Research Scholal
2170189
Department of Life Sciences


POETRY
COLUMN

Enlightening of Trash

SWETHA M
6CBZ_2140563

Sapling of cry etched in heart,
As time passed from tiny bud to a flower.
Mind blown with no patience
Bursting out like a bubble,
Where no rain feeds on flower but just the thunders,
Though looking up for light in the vast
Having faith in her mood.
Walls of boundary she is in,
Could be a valet where she learns up,
Grapple herself to be more potent that she looks up to,
Words aren't spaced out that she craves of it
In the gamble of life that the almighty made her to be.

As time passes her heart becomes lighter,
And brightens to fly higher.
In dark path of the grove,
She grooms her soul to be dwelling,
That she creates her own treasure.
May not be immediately,
But everyday she builds a piece of
progress
Of a sculpture that she dreamed to be.

The House With A Brick Wall

Shingini

The body, without a soul,
Whose clothes had been taken off,
Like plasters on the wall,
Leaving the bricks...
Just before helping them in the fire.
The open windows of the lightened rooms,
Where maybe the soul resided a while ago,
Have been shut close and deserted.
The sorrow of the loss,
Darkening even the brightest of its rooms.
The house, where maybe,
A lot of people felt safe,
Was crushed down leaving just a snapshot,
In the dearest corners of the mind!
The happiest, of memories,
Expressed by diamonds, of the eye..
The touch, of walls,
The feeling of comfort..
It's all lost, in the world, beyond imagination!
The thumbprints still remain...
But, the soul has departed!

Holding a Bit Tighter

Aakashdeep
2BSc LIF_2341046

From holding hands to holding your
memories,
waxing total stories about a stranger,
and acting like the book wasn't about you,
yeah, I was shivering the first time we
hugged,
as my heart was coming to peace,

and it will take some earthquakes before it
settles.
I showed you the damaged parts of my soul,
and you stitched the damaged parts of my
heart,

where I tried painting you,
but no shade matched the way,
the way my heart matched to you,
she never looked nice,
she looked like an art,

an art wasn't only supposed to look nice
but it was supposed to make you feel
something.

The Moon

Sharanya M.G
2BScBtZ_2340660

She,
Who rules the night,
Sits right up there,
Unaware that the souls beneath her
spend hours admiring her charm.
Filled with dust and dents,
That fail to eclipse her beauty,
Shines bright enough
To clear the void of darkness
That surrounds her.
He called her "an arrant thief",
As though she'd made a choice-
To put up with the inevitable shadows
That filled her.
Parts of her are mostly hidden,
Or is it indeed?
'cause familiarity breeds contempt,
She'd rather have it latent.

Birds Today

Bodicherla Mokshitha Sri Sai
4BCB_2240730

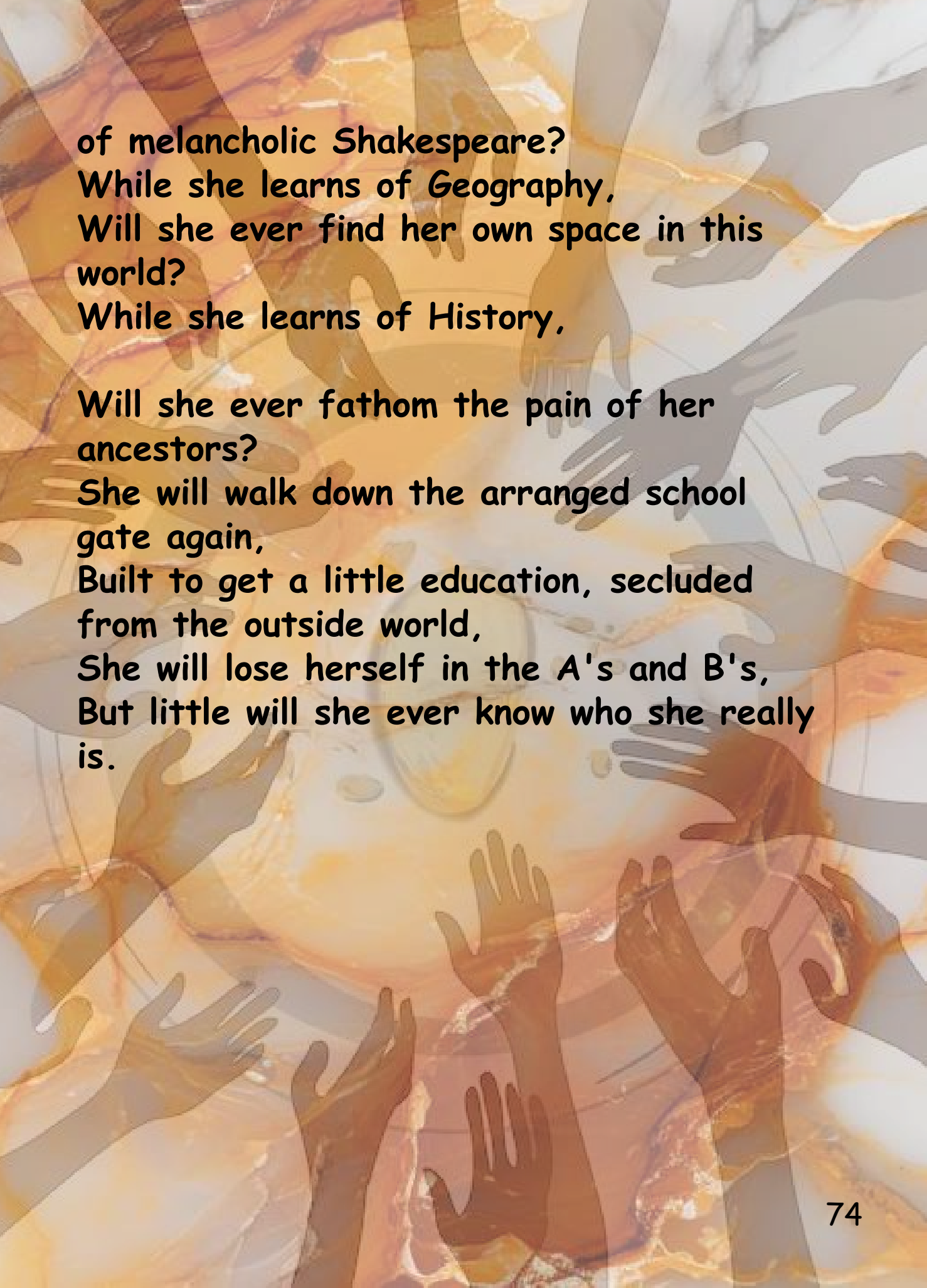
Birds made of hay,
In factory nests they lay,
Lost in concrete are the feathers,
Singing before the rays.

Blinded we ignore today,
An ecological cry for care,
I might live to see the day,
Chirping becomes Painite rare.

Beyond The Arranged Gate

Sayanki Chatterjee
4BCB_2240761

Poverty has poisoned her fragile fate,
Hunger creeps over her bony limbs like ivy leaves creeping along the windows of huge mansions.
She dreams of unicorns, but her world is darkened by the ocean of hopelessness.
Society has abandoned her pure soul,
Her heart bleeds in anguish like red wine dripping down embellished mouths.
She prays for wisdom, but her innocence is plundered by the illusion of lies.
While she learns mathematics in her village school,
Will she know her little world is differentiated from theirs?
While she learns of literature,
Will she know the romanticized hypocrisy



of melancholic Shakespeare?
While she learns of Geography,
Will she ever find her own space in this world?
While she learns of History,

Will she ever fathom the pain of her ancestors?
She will walk down the arranged school gate again,
Built to get a little education, secluded from the outside world,
She will lose herself in the A's and B's,
But little will she ever know who she really is.

Glory Days

Clare Francisca Pinto
2BtZ_2340617

Mother Nature...
She was in all her glory
And this is a real story.
She once had a glorious crown

Made of lush forests

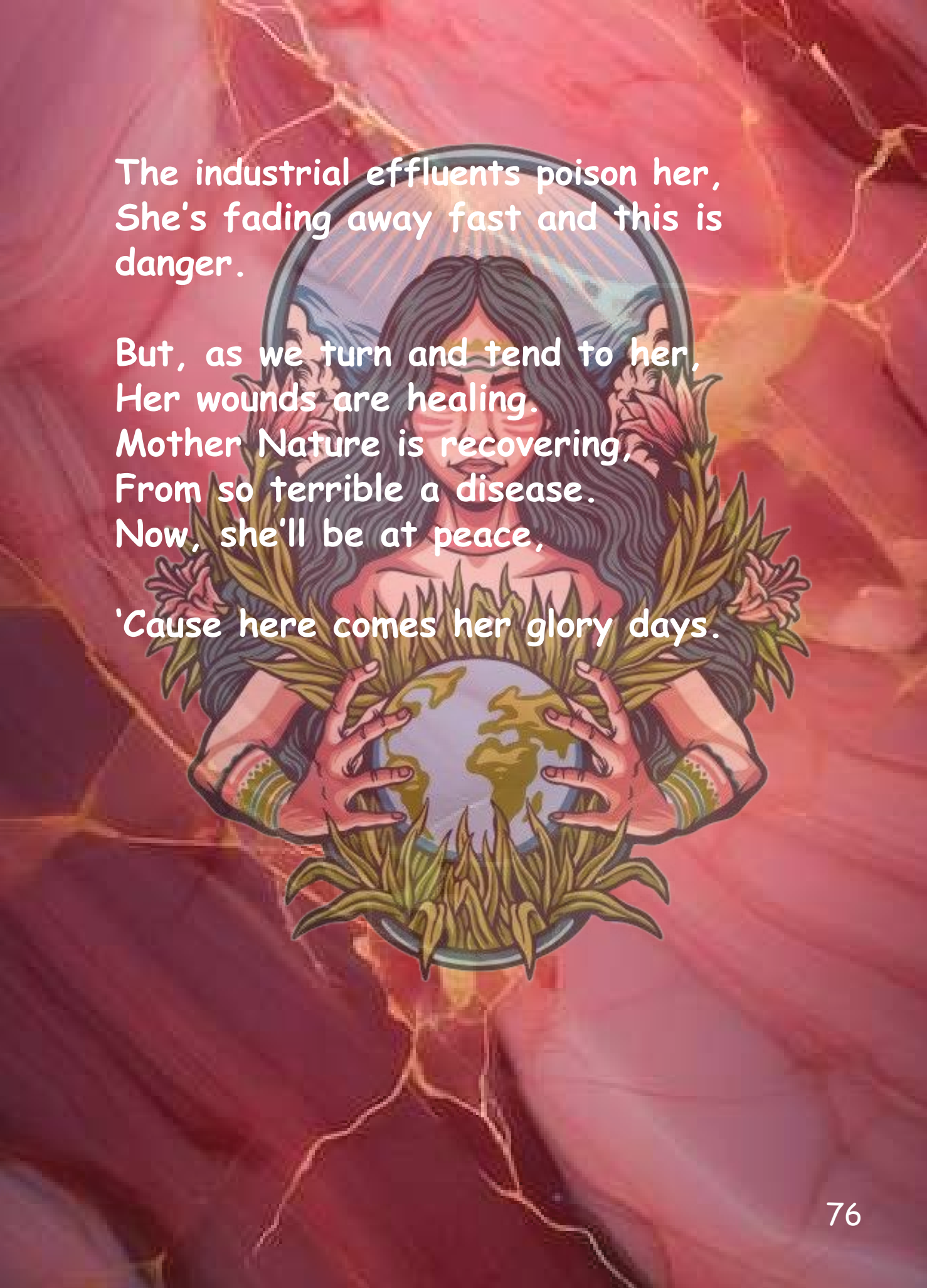
That housed many animal guests.
She had a beautiful gown

Dazzling with waterfalls, crystal clear.
Indeed, so beautiful did she appear.

But now,

All her glory has turned to despair,
To her damage, there's no repair.

The smoke chokes her,



The industrial effluents poison her,
She's fading away fast and this is danger.

But, as we turn and tend to her,
Her wounds are healing.
Mother Nature is recovering,
From so terrible a disease.
Now, she'll be at peace,

'Cause here comes her glory days.

Come Sit With Me

Sayanki Chatterjee
4BCB_2240761

All my life, I've been seeking answers,
Craving my conscience to retrospect.
I have been too hard on myself –
almost forgotten what smiling feels like.
I forgot what it meant to dream – of
paradise and poems.
I'm learning again, I've failed before,
but I'm learning the art of being good
at life,
Taking pauses, sitting, being myself,
Enjoying hot chocolate inside my tiny
hostel room
On a rainy Sunday while reading Lord
Byron.
Come sit with me, take a pause.
Of all the brutality, jealousy, hatred in
this world,
Our darwan uncle never fails to greet
me in the morning,
The uncle on the roadside always gives

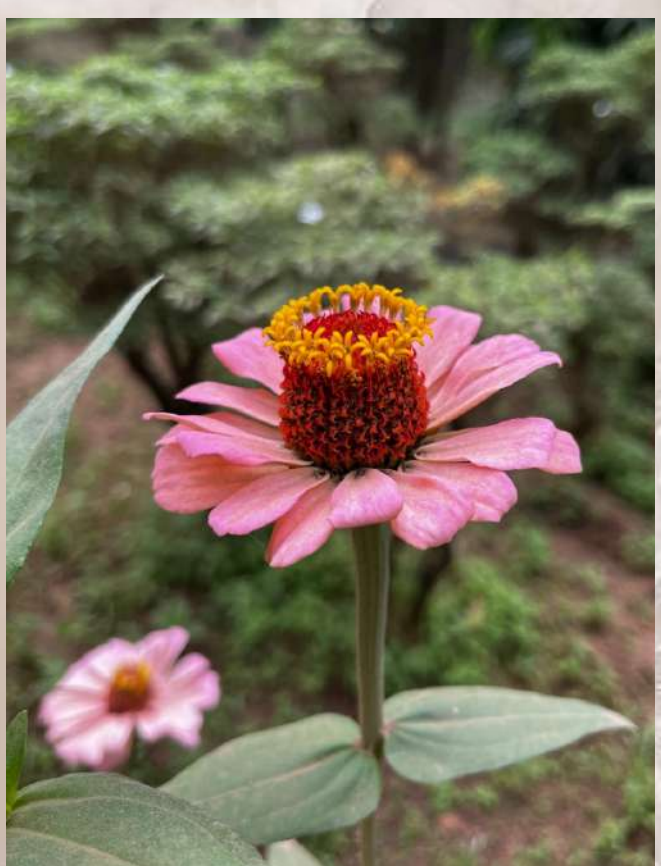
me a smile
When I give him biscuits,

My next-door hostel neighbor isn't as crazy as she seemed to be,
She's actually nice.
I know these because I've learned the art
Of paying attention to small things.
And there is beauty in every little detail
That can possibly exist.
As I stare outside while drinking hot chocolate on a rainy Sunday,
The rain drops down the shabby window pane,
I know I've learned the art of being good at life.

PHOTOGRAPHY

Column

Anouska Banerjee
2240705
4BCB



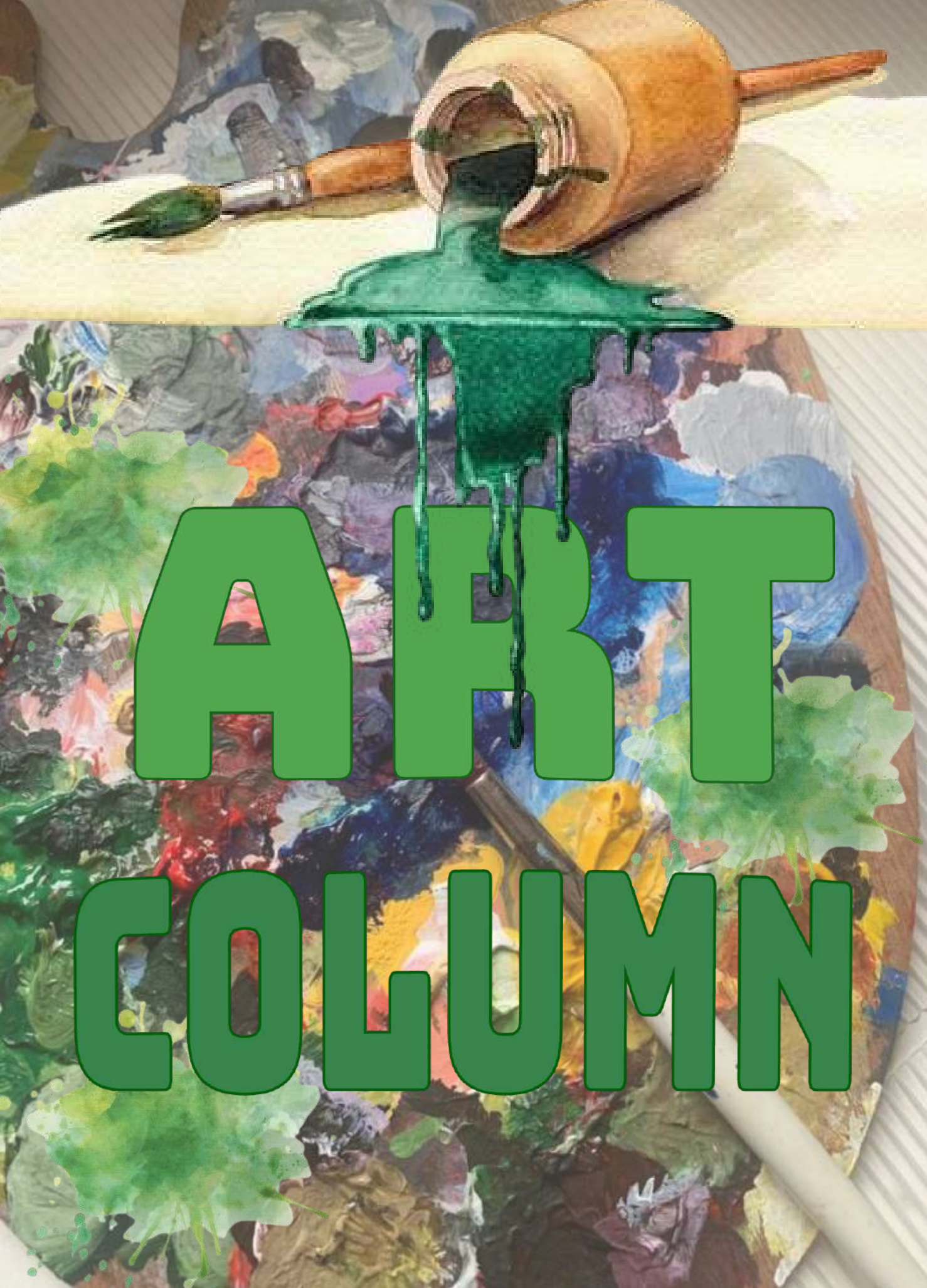
Krishnashish Das
2240719
4BCB

Bushra Khan
PhD Scholar

Anouska Banerjee
2240705
4BCB

Bushra Khan
PhD Scholar

Anoushka Banerjee
2240705
4BCB

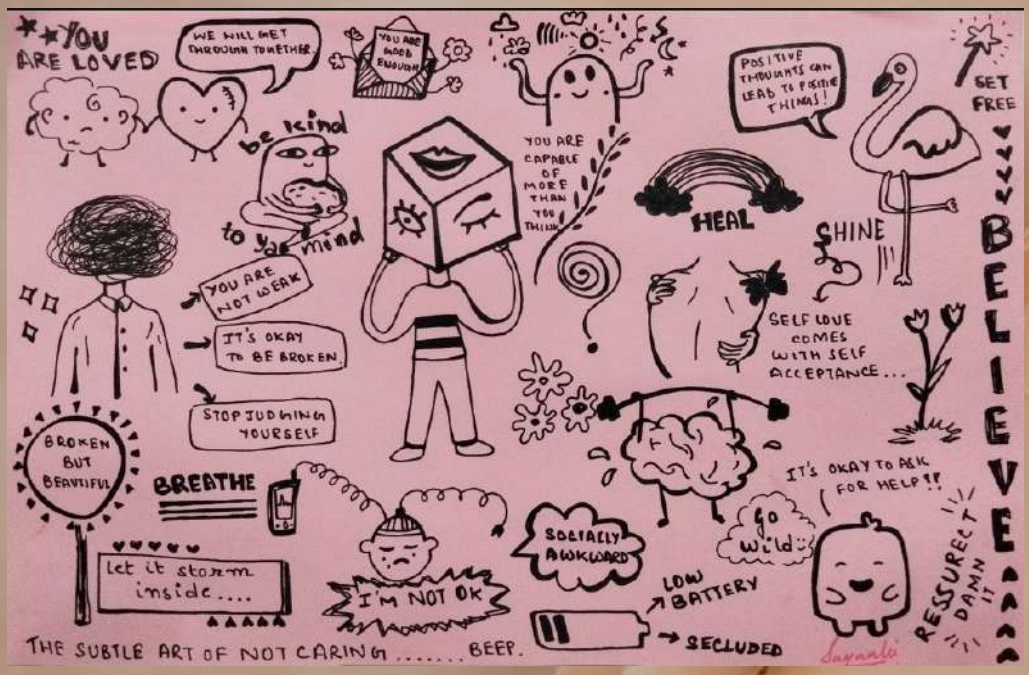

ART
COLUMN

Y Shringa. V
2Bsc BtC

Bhuvan Raj K
2240561
4CBZ

Nikita Sunil
2240737
4BCB

Sayankee Chatterjee
2240761
4BCB



Judit Patricia Ficker
2341137
2Bsc BtF


Archives
of the
Year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Bengaluru, Karnataka, India
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GPS Map Camera
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