EDITION 1 | VOL. 1 | APRIL 2025

TELLUS MIRABELLA

DEPARTMENTAL MAGAZINE

THE BEAUTY OF EARTH

A GEOLOGICAL PERSPECTIVE

ARYA VIDYAPEETH COLLEGE (AUTONOMOUS)
GUWAHATI-16

DEPARTMENT OF GEOLOGY

FOUNDER HEAD OF THE DEPARTMENT

PROF. NABIN CHANDRA DAS

Our sincere Gratitude
to the founder of Department of Geology
Arya Vidyapeeth College (Autonomous),
Guwahati.

Message from principal's desk

Tellus Mirabella - The Departmental Magazine of Geology

It gives me immense pleasure to know that the Department of Geology, Arya Vidyapeeth College (Autonomous), is bringing out its online departmental magazine titled Tellus Mirabella, meaning "the beauty of Earth or World."

A departmental publication is a meaningful step towards documenting academic activities and encouraging student and faculty participation in knowledge sharing. Such initiatives provide a valuable platform for students and faculty to engage beyond the classroom and contribute towards building an active academic culture. The magazine is the result of the department's effort to encourage participation, collaboration, and the expression of ideas related to the field of Geology. I hope this initiative helps build a stronger academic environment within the department and motivates students to take an active interest in the subject.

I appreciate the sincere efforts of the faculty members, editorial team and students involved in this publication. I hope Tellus Mirabella continues to grow as a medium of knowledge sharing and academic enrichment in the years ahead.

With best wishes,

Dr. Pradip Kumar Bhattacharyya

Principal

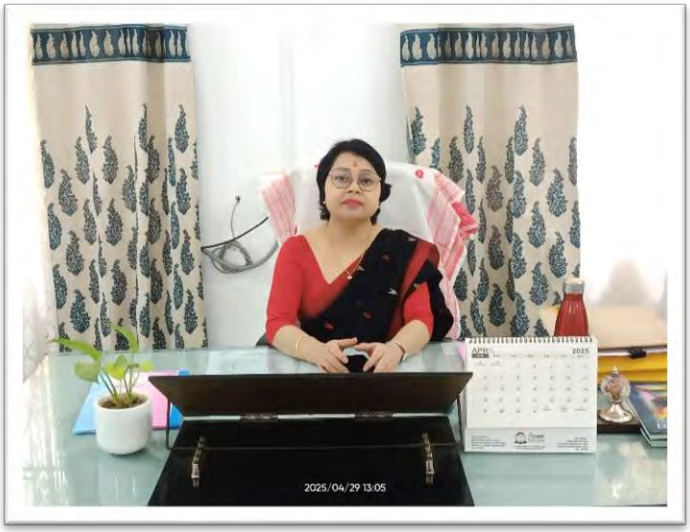
Arya Vidyapeeth College

(Autonomous)

Guwahati – 781016

Message from

Vice principal's desk



শুভেচ্ছাবাণী

আর্য্য বিদ্যাপীঠ মহাবিদ্যালয়ৰ ভূতত্ত্ব বিভাগৰ ছাত্ৰ-ছাত্ৰীসকলে ই-আলোচনী "Tellus Mirabella" প্ৰকাশ কৰিবলৈ ওলোৱা খবৰটো পাই অতিকৈ আনন্দিত হৈছোঁ। শিক্ষানুষ্ঠান এখন বৌদ্ধিক আৰু মানসিকভাৱে সজীৱ আৰু গতিশীল কৰি ৰখাৰ অন্যতম মাধ্যম হৈছে আলোচনী। এইক্ষেত্ৰত মহাবিদ্যালয়ৰ মুখপত্ৰ "এৰিয়ান"ৰ উপৰিও বিভাগীয় আলোচনীসমূহে শিক্ষার্থীসকলৰ স্কৰীয় প্ৰতিভাৰ প্ৰকাশ আৰু বিকাশত উল্লেখনীয় ভূমিকা গ্ৰহণ কৰে। ভূতত্ত্ব বিভাগৰ "Tellus Mirabella" আলোচনীখনো ছাত্ৰ-ছাত্ৰীসকলৰ সৰ্বাংগীন বিকাশৰ মাধ্যম হওঁক তাকেই কামনা কৰিলোঁ।

ছাত্ৰ-ছাত্ৰীসকলৰ উজ্জ্বল ভৰিষ্যৎ কামনাৰে আৰু বিভাগৰ সমূহ সদস্যলৈ আন্তৰিক শুভেচ্ছাৰে।

অনিতা তালুকদাৰ

উপাধ্যক্ষা

আর্য্য বিদ্যাপীঠ মহাবিদ্যালয়

(স্বায়ত্ত্ব শাসিত)

Message from the Head of the department

I am glad to know that the students of the department have been preparing for launching an e-magazine from our department. This will definitely be a great opportunity for our students to get involved with the project and give their support to make it a success. Students will also get the opportunity to explore their own experiences and creativity by their writings on this e- magazine. It gives me immense pleasure when I see our students doing well in their academic pursuit along with various extra-curricular activities. Like previous years, this year also six students have cleared IIT-JAM. It is a matter of pride that last year Partha Pratim Saha cleared CUET. I dream of seeing our department scaling glorious heights in the years to come. I hope the E-magazine will be very informative and helpful for the student community for their future endeavours. Let us be positive. I wish you all the best. May God bless us!

Swapnali Dutta

Dr Swapnali Dutta

Head of the Department

Department of Geology

Arya Vidyapeeth College (Autonomous)

Message from the Teacher -In-charge

As we are associated with the process of initiating the online magazine of our department for the first time, we are delighted to witness the remarkable talents of our students, their involvement and dedication, inviting us to reflect on a theme that resonates deeply with both our hearts and our discipline "GEOLOGY", Tellus Mirabella or the Beauty of Earth. From the beautiful hills to the silent depths of the oceans, from the ancient rocks to the sparkle of crystalline minerals, the Earth offers a symphony of wonder for those who choose to see. As students of Geology, Arya Vidyapeeth College, and as learners and admirers of Geology, we are positioned to appreciate this beauty as we uncover the stories etched into every mineral, every rock, every fossil, every mountain carved by time. In today's world, where climate change, resource depletion, and environmental degradation pose urgent challenges, the appreciation of Earth's beauty is not a luxury anymore but it is a necessity. Every rock we study, every fossil we uncover, tells not just of ancient times, but of the future we are shaping. By understanding the processes that have shaped our planet over billions of years, we also recognize our responsibility to protect it for future generations. Our department of Geology reminds us daily that the Earth is a living, breathing entity, constantly evolving. In geology every earth material we study, connects us to a larger story of resilience, transformation, and awe. In embracing Tellus Mirabella, let us pledge not only to marvel at Earth's grandeur but to be its devoted guardians. We are grateful to our college authorities for their inspiration to get involved in this endeavour. Special thanks should also be given to our Head of the Department Dr Swapnali Dutta for her dedicated involvement which greatly contributed to the successful publication of the magazine. We also extend our heartfelt appreciation to all faculty members and alumni for their invaluable help, suggestions and contributions towards this noble initiative. Last but not the least we are truly grateful towards our strength, our dear students, whose relentless involvement and dedication helped us reach another milestone with the publication of our magazine.

With warm wishes,

Dr. Jonali Medhi

Associate Professor

Department of Geology

Arya Vidyapeeth College

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Acknowledgement

We begin by expressing our profound gratitude to the Almighty for the boundless grace and blessings for guiding us throughout the journey of creating this e-magazine. We extend our sincere thanks to our esteemed Principal Dr.Pradip Kumar Bhattacharya and our respected Vice Principal Dr.Anita Talukdar for their support. We are deeply grateful to our Head Of Department and advisor Dr.Swapnali Dutta, our teacher in charge Dr.Jonali Medhi and all the faculties of the Department of Geology for their guidance, constructive feedback and inspiration. Our sincere appreciation goes to our editorial team, writers, designers and photographers whose dedication and creativity made this journey successful.

Editorial Board

Tellus Mirabella e-magazine

Department of Geology

Arya-Vidyapeeth College (Autonomous)

Message from Editor in chief

Dear readers,

It is with great pleasure and excitement to present before you the latest edition of "Tellus Mirabella" which means "the Beauty of Earth or World". The official e-magazine of the Department of Geology at Arya Vidyapeeth College. In this rapidly evolving world, geosciences not just aim to study the past but also it helps to understand earth's structure, history and the dynamic processes that shape our planet which is a key to sustainable future. From Earth's mysterious 8th continent to recent discoveries in Geology, our contributors have journeyed across continents, recent scientific discoveries and trends to bring fresh perspectives and silent stories told by the rocks and different geological features. Our students, alumni and faculties have contributed articles that reflect a critical thinking and research for the evolving role of geosciences. I'm immensely grateful to the contributors, editorial board and design members for creative inputs and insightful articles to the magazine. I hope readers find "Tellus Mirabella" encouraging, inspiring and strengthens our shared passion for the Earth sciences. Our planet which is 4.5 billion years old with millions of years in the making, here we are just beginning to read its pages.

Happy reading.

Sincerely,

Dibyakansha Sarmah

Editor-in-chief

On behalf of editorial board

Tellus Mirabella e-magazine

Department of Geology

Arya-Vidyapeeth College (Autonomous)

Content

Student's section	Author	Page no
1. Zealandia-earth's mysterious 8th continent	Arupam Bhat	13-14
2. Environmental Geology	Lydia Hansepi	14-15
3. The whispering reeds of Badarpur	Joy Kumar Sarkar	16-20
4. Palaeontology	Anurag Dutta	21-23
5. Moh's scale of hardness	Nilutpal Baishya	23-25
6. Deccan traps: Indian's own Volcanic wonderland	Isha Talukdar	25-26
7. Earth through the ages	Avoy Das	26-28
8. Recent discoveries in geology	A. Shravani Kameshwari	28-30
9. Volcanism	Rikshita Laskar	30-31
10. Enso and its effect on Indian Monsoon	Dhritiraj Talukdar	32-33
11. Oceanography	Dibyakansha Sarmah	33-35
12. Global atmospheric circulation	Rupshi Barik	36

Teacher's section	Author	Page no
1. Petroleum: The black Gold and the Birth of oil fields in India.	Nafisa Shameem Rahman	38

Alumni's section	Author	Page no
1. Bordoisila	Dr.suman saikia	39-41

2. Indian ancient connection with Antarctica: The geological narrative of a Drifting continent	Sushmita Bhattacharjee (Batch: 2017-2020)	41-43
3. Assam and earthquakes	Pijush Kalita (Batch: 2021-2024)	43-45
4. Embracing python and machine Learning in earth science: a call to future geology.	Darshan Swargiary	46-48

Non-teaching staff	Author	Page no
1. এটি কণমানি শব্দ	Jagadish kalita	48

Photo gallery	Page no
Photo gallery with achievements And departmental activities.	49-57

Conclusion	58

Zealandia – Earth's Mysterious 8th Continent!

- Arupam Bhat

(B.Sc. 4th semester)

Everybody knows about the 7 continents of the world – Asia, Africa, North America, South America, Europe, Oceania and Antarctica. However, Geoscientists recently had a shocking discovery that the 8th continent is actually hiding under the Pacific Ocean for over 83 million years! In 1895, a geologist named James Hector found something unusual about the country of New Zealand and claimed that the country actually sits on the top of a mountain range, and rest of the mountains are situated under the Pacific Ocean. In other words, he claimed that there might be much bigger landmass situated below New Zealand. Later, in the 90s, satellite imagery confirmed that his claims were actually true! Beneath the waters of New Zealand and New Caledonia exists an ancient continent named 'Zealandia'.

Topographic map of Zealandia

(Sir James Hector)

94 % of Zealandia's land is submerged under the Pacific Ocean, about more than 3000 feet deep into the ocean, and only 6% of its land is what appears to us as the parts of New Zealand and New Caledonia. Geologists found out that Zealandia was part of the ancient supercontinent Gondwana, which broke apart around 80 million years ago. As Gondwana broke apart, Zealandia began to sink beneath the waves. Mapping of Zealandia concluded in 2023. With a total area of approximately 4,900,000 km², Zealandia is six times bigger than Madagascar and almost more than half of the size of Australia. Having such a large area, distinct continental crust, elevation with surrounding ocean and other geological features is what fulfilling its criteria of becoming a continent. Geologically, Zealandia is characterized by two nearly parallel ridges, a failed rift, and a thinner than average crust, hence, revealing a history of rifting, volcanism, and connection to the ancient supercontinent Gondwana. The ridges rise above the sea floor to heights of 1000–1500 m (3,300–4,900 ft), with a few rocky islands rising above sea level. The ridges are continental rock, but are lower in elevation than normal continents because their crust is thinner than usual, approximately 20 km (12 mi) thick, and consequently, they do not float so high above Earth's mantle as that of most landmasses. In 2017, a team of eleven geologists from New Zealand, New Caledonia, and Australia concluded that Zealandia fulfils

all the requirements to be considered a submerged continent, rather than a Microcontinent or continental fragment. Even though, as of now, Zealandia is yet to be recognized in the world maps, however, recognition of Zealandia could lead to a more accurate understanding of Earth's geology and plate tectonics.

Size of Zealandia (in comparison with Australia)

DID YOU KNOW?

The core is hotter than the sun's surface

Environmental Geology

- lydia hansepi

(B.Sc. 2nd semester)

"Environmental Geology- The Earth is speaking. Are we Listening?" When you hear the word geology, what pops into your mind? Rocks?

Volcanoes? Maybe the occasional dinosaur bones? That is fair but there is a lot more to geology than just studying the Earth's past. In fact, one branch of geology is deeply connected to our present -and our future. It is called Environmental Geology and it is one of the most important, underrated fields, shaping the world we live in.

"So, want to know what is Environmental Geology?"

Environmental Geology is what geology meets real world problems. It is the study of how geologic processes- like earthquakes, erosion or ground water movement - interact with human activity. This field helps us understand how to build safer cities, manage natural resources, clean up pollution and respond to climate change. In other words, environmental geologists are the scientists who keep our environment and us safe.

"Disaster Prediction? Yes, geologists have to know it!

Imagine a team of scientists studying the slope of a hill to see if a landslide is likely or using data from fault lines to estimate earthquake risk before a new highway is built. That is environmental geology in action. From floor-prone cities to coastal towns facing rising seas, environmental geologists assess the land before problems strike. Their recommendations influence building codes, land use planning and emergency response system. They are often the first line of defense between natural hazards and human lives.

"Pollution? They track it like detectives."

Environmental geologists are also crucial in investigating and solving environmental contamination. When oil leaks into soil or toxic chemicals seep into ground water, They figure out how to fix it. They use tools like GIS mapping, hydrogeology models to track pollution and help clean it up.

"Why should you care?"

Environmental geology is more than just studying rocks- it's about protecting people, preserving ecosystems and preparing for a safer future. In a world facing rising climate risks and growing environmental challenges, this scene is not optional -it is essential. So, next time you walk past a stream, hike a trail or drink from the tap, remember: there is geology beneath your feet and environmental geologists making sure it stays safe.

DID YOU KNOW?

The largest cold desert on Earth is Antarctica.

The Whispering Reeds of Badarpur

- Joy Kumar Sarkar
(B.Sc. 6th semester)

The monsoon had arrived early in Badarpur that year, painting the landscape in a perpetual shade of emerald and turning the Barak River into a swollen, churning beast. The air hung thick and heavy, scented with wet earth and the cloying sweetness of blooming jasmine. For most, it was a time of relief after the oppressive heat, but for Rohan, the early rains brought with them a gnawing unease, a prickling sensation on the back of his neck that never quite subsided.

He lived in a small, ancestral home on the outskirts of town, nestled amidst a dense thicket of bamboo and a sprawling field of reeds that stretched down to the riverbank. The house, with its creaking wooden floors and perpetually damp walls, had always held a certain mystique, a silent witness to generations of his family. But lately, the silence felt different, heavier, punctuated by whispers that seemed to slither in with the humid air.

It started subtly. A faint rustling in the reeds even when there was no

breeze. A fleeting shadow in the corner of his eye. The distinct feeling of being watched, even when he was alone. Rohan, a pragmatic man in his late twenties who worked as a clerk in the local tea factory, initially dismissed it as stress, the product of long hours and the oppressive weather.

But the incidents grew more frequent, more distinct. One evening, as he sat on the porch sipping his tea, he heard his grandmother's name, clear as a bell, carried on the wind from the direction of the reeds. His grandmother had passed away years ago, and the sound sent a shiver down his spine despite the warm air.

He tried to rationalize it. The wind playing tricks. The rustling of small animals in the undergrowth. His own mind playing games. But the whispers persisted, weaving themselves into

the fabric of his days and nights. Sometimes they were unintelligible murmurs, like a crowd speaking in a language he didn't understand. Other times, he could almost make out words, fragments of sentences that hinted at sorrow, at loss, at something ancient and malevolent.

The villagers, a close-knit community steeped in tradition and folklore, spoke of the reeds with a hushed reverence. They called them the "Shanti Van," the Silent Woods, but their silence was often interpreted as a watchful presence. Old Man Das, the village elder, with his eyes like ancient river stones, had once told Rohan, "The reeds remember, son. They remember everything that the river has carried, everything that the land has swallowed."

Rohan had always considered such tales as quaint superstitions. But now, as the whispers intensified, a seed of doubt began to sprout in his mind. He started avoiding the path that led through the reeds to the river, taking a longer route even though it added precious minutes to his commute.

One particularly stormy night, the power went out, plunging his house into darkness. The rain lashed against the windows, and the wind howled through the bamboo grove like a tormented spirit. Huddled in his bed with a flickering lantern, Rohan heard it again – his name, whispered just outside his window, followed by a soft, rhythmic sigh that seemed to emanate from the heart of the reeds.

Fear, cold and sharp, pierced through his skepticism. He pulled the thin blanket tighter around himself, his heart pounding against his ribs. He wanted to call out, but his voice seemed trapped in his throat. He lay there, rigid with terror, until the first

pale light of dawn crept through the gaps in the shutters.

The next morning, the storm had passed, leaving behind a world washed clean and glistening. But the oppressive feeling remained. Rohan decided he needed to understand what was happening. He sought out Old Man Das.

The old man listened patiently, his wrinkled face etched with concern. When Rohan finished, he sighed, a sound like the wind rustling through dry leaves.

"The reeds… they have always been a place of power, Rohan," he said, his voice low and grave. "The river carries not just water, but also memories, sorrows. Sometimes, when the balance is disturbed, when something… awakens… the reeds speak.

"Awakens? What do you mean?" Rohan asked, his voice trembling slightly.

Old Man Das hesitated, his gaze distant. "There are stories… old stories… of a spirit tied to the land, a guardian of the river who was wronged long ago. They say her sorrow became part of the reeds, her whispers carried on the wind."

Rohan scoffed internally. A wronged spirit? It sounded like something out of a children's story. But the fear he had felt the previous night was anything but childish.

"What can I do?" Rohan asked, his voice barely a whisper.

"Stay away from the reeds, son. Do not disturb their silence. If the whispers are meant for you, they will eventually fade."

Rohan tried to follow the old man's advice. He avoided the reeds, kept his windows closed, and tried to focus on his work. But the whispers followed him. He would hear them at the tea factory, a faint susurrus beneath the clatter of machinery. He would hear them in the marketplace, a ghostly undertone to the boisterous chatter.

Sleep became a luxury. Every night, he would lie awake, straining to hear the whispers, his nerves stretched taut. He started seeing things – fleeting movements at the edge of his vision, dark shapes that seemed to melt back into the shadows.

One afternoon, driven by a desperate need for answers, Rohan decided to venture into the reeds. He knew it was foolish, but the constant torment was becoming unbearable. Armed with a stout bamboo stick, he pushed his way through the dense growth.

The reeds were taller than him, their feathery tops swaying gently even

though there was no discernible wind. The air within the thicket was still and heavy, the silence broken only by the occasional chirp of a hidden bird. But beneath the surface silence, he could sense a presence, a watchful stillness that made the hairs on his arms stand on end.

As he ventured deeper, the ground beneath his feet became soft and muddy. The air grew colder, and a faint, sweetish odor, like decaying flowers, filled his nostrils. The whispers started again, faint at first, then growing louder, swirling around him like unseen currents.

He could almost make out words now. "Lost… alone… forgotten…"

A sense of profound sadness washed over him, so intense it almost brought him to his knees. He felt a strange connection to the whispers, a sense of shared sorrow.

Suddenly, he stumbled upon something. Partially hidden amongst the reeds was a small, moss-covered stone structure, barely taller than a man. It looked ancient, its surface weathered and worn. As he approached, the whispers intensified, becoming a chorus of mournful sighs.

Curiosity overriding his fear, Rohan cleared away the moss and debris. Carved into the stone was a name: "Lalita." Beneath it, a date from centuries past.

As he traced the letters with his fingers, a vision flashed through his mind – a young woman with long, dark hair, her eyes filled with tears, standing by the riverbank. He saw a boat capsizing in the turbulent waters, a desperate struggle, and then… nothing but the swirling currents.

The whispers coalesced into a single, heart-wrenching sob.

Rohan understood. Lalita. The guardian of the river, wronged by fate, her sorrow trapped within the reeds. The whispers were not malevolent; they were a lament, an eternal yearning for what was lost.

But why were they reaching out to him?

As he pondered this, he noticed something else near the stone structure – a small, tarnished silver anklet, half-buried in the mud. It looked old, its intricate design hinting at a forgotten era.

He picked it up. As his fingers closed around the cold metal, another vision flooded his mind. He saw a young boy, no older than five, running through the reeds, laughing, his anklet catching the sunlight. He saw the same boy, years later, grown

into a young man, standing by the riverbank, his eyes filled with grief.

The realization struck him with the force of a physical blow. His ancestor. The boy who had lost Lalita. The sorrow of that loss had seeped into the land, into the reeds, waiting to be acknowledged.

And somehow, Rohan, a descendant from that very lineage, had become a conduit for that ancient grief.

He clutched the anklet tightly, a wave of empathy washing over him. He understood the whispers now, the longing, the pain. He felt a connection to Lalita, to his ancestor, to the history buried beneath the soil of Badarpur.

He spent the rest of the day by the stone structure, clearing away the overgrown vegetation, his heart heavy with a sorrow that was not entirely his own. As the sun began to set, casting long shadows across the reeds, he spoke aloud, his voice thick with emotion.

"Lalita," he said, "I hear you. I understand your pain. You are not forgotten."

As he spoke, the whispers seemed to soften, the mournful sighs fading into a gentle rustling of the reeds. A sense of peace, fragile but palpable, settled over the Shanti Van.

Rohan returned home that night, the silver anklet tucked safely in his pocket. The whispers still lingered, but they were different now, softer, less insistent. They no longer felt like a torment, but more like a quiet presence, a gentle reminder of a sorrow that had finally found an ear to listen.

Over the next few weeks, Rohan visited the stone structure regularly. He cleaned it, placed flowers he picked from his garden, and spoke to the reeds, sharing stories of his life, of his family, of the changing times. He felt a strange sense of responsibility towards Lalita, towards the memory trapped within the Shanti Van.

One evening, as he sat by the riverbank, the setting sun painting the sky in hues of orange and purple, he felt a cool breeze brush against his face. It carried no whispers, only the gentle scent of the river and the rustling of the reeds. For the first time in a long time, Rohan felt a sense of calm, a quiet understanding that transcended words.

The whispers never completely disappeared. Sometimes, on particularly still nights, he would still hear them, a faint, melancholic murmur carried on the wind. But they no longer filled him with fear. Instead, they reminded him of the

interconnectedness of life and loss, of the enduring power of memory, and of the secrets that lay hidden within the whispering reeds of Badarpur. He had become the keeper of their sorrow, a silent listener in the Shanti Van, forever bound to the spirit of the river and the echoes of a love lost long ago. And in that strange, unsettling way, he had found a peculiar kind of peace.

DID YOU KNOW?

1. The Earth's magnetic poles have flipped hundreds of times throughout history this is called geomagnetic reversal.
2. Mauna Kea in Hawaii is actually taller than Mount Everest if measured from its base on the ocean floor.
3. Earthquakes can make Earth "ring" like a bell, producing free oscillations that can be detected for days.
4. The Grand Canyon exposes nearly 2 billion years of geological history from top to bottom.
5. Super volcanoes can cause global cooling- past eruptions like Toba drastically altered Earth's climate.

PALAEONTOLOGY

- Anurag Dutta
(B.Sc. 2nd semester)

Dear readers, do you know how was the world tens and hundreds of millions of years ago. Deep within the Earth Crust, Fossil of ancient creature hold secrets of a bygone era .... Palaeontology, the study of these fossilized remains, has revealed a wealth of information about the evolution of life on earth.

Palaeontology is the study of the history of Earth as based on fossil. Fossils are their remains of plants, animals, fungi, bacteria,and single-celled living things that have been fully or partially replaced by rock material or impressions of organisms preserved in rock. Paleontologists use fossil remains to understand different aspects of extinct and living organisms.

"George Curvier" (1769-1832) is known as the Father of Paleontology.

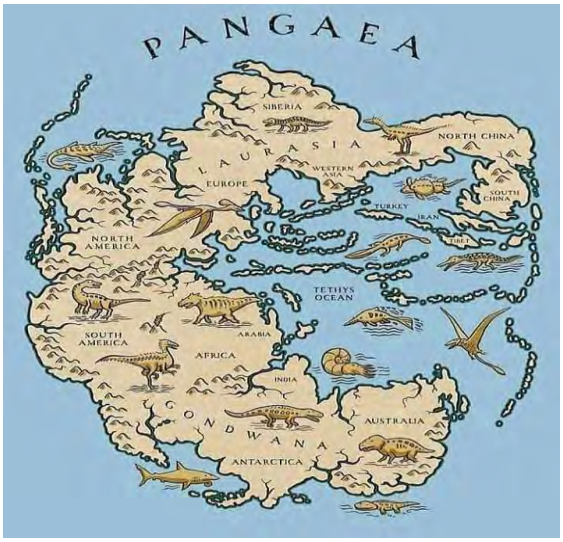


Image – The Pangaea

Image: An extinct Graptolite dating back to the Ordovician and Silurian Period.

History Of world Palaeontology:

Throughout Human History, Fossils have been used, studied and understood in different ways. Early civilization used fossils for decorative or religious purpose, but did not always understand where they came from. The formal science of Palaeontology started in the year 1700's with fossil collection and description, a period of time known as the "Age of Enlightenment". Scientist began to describe and map Rock formation and classify Fossil.

•Geologist discovered that Rock layer were the product of long periods of sediments build up, rather that result of single event or Catastrophes

• Lyell's Principle of Geology Stated that the fossil in one rock layer were similar, but fossil in other rock layer were different. This sequence could be used to show relation between similarly rock layers separated by great distances. Fossil discovered between in South America may have more in common with fossil from Africa than fossil from different rock layers nearby

• Darwin suggested that new species evolve over time, new fossils discovered supported Darwin theory creatures living in the distant past were different from, yet sometimes interconnected with, those living today. This theory allowed paleontologist to study living organisms for clues to understand fossil evidence.

The Dating of rock layers and fossil was revolutionized after the discovery of radioactivity in the late 1800's. Using a process known as radiometric dating. Scientist can determine the age of a rock layer by examining how certain atoms in the rocks have changed since the rock formed.

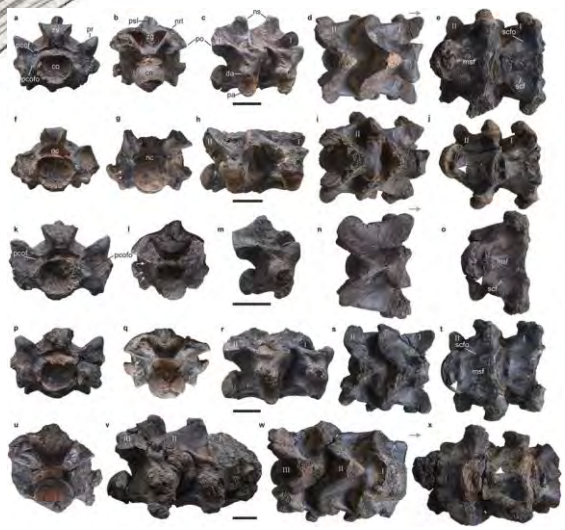
HISTORY OF INDIAN PALEONTOLOGY

The Sub-continent fossil record is rich and includes fossil from the earliest plant remain to the quaternary epoch. The first dinosaur bone in India was discovered by W. H. Sleeman in 1828 in the lameta sedimentary of Jabalpur

"Birbal Sahni" (1891-1949) is known as the Father of Indian Paleontology.

Recently, In 2024, Vasuki Indicus, was described as a new genus and species of

Madlsoud snake based on these fossil remains



This is one the most recent one, a team of scientist from IIT-Roorkee and the Geological Survey of India announced the discovered of the fossil remains of a 167-million years old plant eating dicraeosaurid dinosaur (long necked). This discovery was important as it is the the oldest known Dicraeosaurid in the world and it was discovered in India

PALEONTOLOGY IN MODERN ERA

Modern Paleontologists have a variety of tools that help them discover examine and describe fossil. Electron microscopes allow paleontologist to study tiniest details of the smallest fossil. X-ray machines and CT scanners reveal fossil internal structures. Advanced Computer programs can analyze fossil data, reconstruct skeletons, visualize the bodies and movements of extinct organism. A CT scanner allows scientists to construct 3-D representation of the bone and tissue of the organism.

Geologic Time Scale

Era	System & Period	Series & Epoch	Some Distinctive Features	Years Before Present
CENOZOIC	Quaternary	Recent	Modern man.	11,000
		Pleistocene	Early man; northern glaciation.	1/2 to 2 million
	Tertiary	Pliocene	Large carnivores.	13 ± 1 million
		Miocene	First abundant grazing mammals.	25 ± 1 million
		Oligocene	Large running mammals.	36 ± 2 million
		Eocene	Many modern types of mammals.	58 ± 2 million
		Paleocene	First placental mammals.	63 ± 2 million
MESOZOIC	Cretaceous		First flowering plants; climax of dinosaurs and ammonites, followed by Cretaceous-Tertiary extinction.	135 ± 5 million
	Jurassic		First birds, first mammals dinosaurs and ammonites abundant.	181 ± 5 million
	Triassic		First dinosaurs. Abundant cycads and conifers.	230 ± 10 million
PALEOZOIC	Permian		Extinction of most kinds of marine animals, including trilobites Southern glaciation.	280 ± 10 million
	Carboniferous	Pennsylvanian	Great coal forests, conifers. First reptiles.	310 ± 10 million
		Mississippian	Sharks and amphibians abundant. Large and numerous scale trees and seed ferns.	345 ± 10 million
	Devonian		First amphibians; ammonites; fishes abundant.	405 ± 10 million
	Silurian		First terrestrial plants and animals.	425 ± 10 million
	Ordovician		First fishes; invertebrates dominant.	500 ± 10 million
	Cambrian		First abundant record of marine life; trilobites dominant.	600 ± 50 million
	Precambrian		Fossils extremely rare, consisting of primitive aquatic plants. Evidence of glaciation. Oldest dated algae, over 2,600 million years; oldest dated meteorites 4,500 million years.	

Image: Geological Time Scale

DID YOU KNOW?

A large portion of the world's volcanoes are concentrated in the Pacific Ring of Fire.

Understanding the Mohs Hardness Scale: A Key Concept in Mineralogy

By Nilutpal Baishya

(B.Sc. 2nd Semester)

Mohs scale of hardness

Mohs hardness, rough measure of the resistance of a smooth surface to scratching or abrasion, expressed in terms of a scale devised (1812) by the German mineralogist Friedrich Mohs. The Mohs hardness of a mineral is determined by observing whether its surface is scratched by a substance of known or defined hardness. To give numerical values to this physical property, minerals are ranked along the Mohs scale, which is composed of 10 minerals that have been given arbitrary hardness values. The minerals contained in the scale are shown in the Table; also shown are other materials that approximate the hardness of some of the minerals. As is indicated by the ranking in the scale, if a mineral is scratched by orthoclase but not by apatite, its Mohs hardness is between 5 and 6. In the determination procedure it is necessary to be certain that a scratch is actually made and not just a "chalk" mark that will rub off. If the species being tested is fine-grained, friable, or pulverulent, the test may only loosen grains without testing individual mineral surfaces; thus, certain textures or aggregate forms may hinder or prevent a true hardness determination. For this reason the Mohs test, while greatly facilitating the identification of minerals in the field, is not suitable for accurately gauging the hardness of industrial materials such as steel or ceramics. (For these materials a more precise measure is to be found in the Vickers hardness or Knoop hardness.)

Mohs hardness scale and observations on hardness of some additional materials

mineral	Mohs hardness	other materials	observations on the minerals
talc	1		very easily scratched by the fingernail; has a greasy feel
gypsum	2	~2.2 fingernail	can be scratched by the fingernail
calcite	3	~3.2 copper penny	very easily scratched with a knife and just scratched with a copper coin
fluorite	4		very easily scratched with a knife but not as easily as calcite
apatite	5	~5.1 pocketknife ~5.5 glass plate	scratched with a knife with difficulty
orthoclase	6	~6.5 steel needle	cannot be scratched with a knife, but scratches glass with difficulty
quartz	7	~7.0 streak plate	scratches glass easily

Mohs hardness scale and observations on hardness of some additional materials

mineral	Mohs hardness	other materials	observations on the minerals
topaz	8		scratches glass very easily
corundum	9		cuts glass
diamond	10		used as a glass cutter

Another disadvantage of the Mohs scale is that it is not linear; that is, each increment of one in the scale does not indicate a proportional increase in hardness. For instance, the progression from calcite to fluorite (from 3 to 4 on the Mohs scale) reflects an increase in hardness of approximately 25 percent; the progression from corundum to diamond, on the other hand (9 to 10 on the Mohs scale), reflects a hardness increase of more than 300 percent.

practical uses of the Mohs hardness scale

1. Mining industry

The Mohs hardness scale is crucial in mining and mineral extraction. Understanding the hardness of a mineral helps industries determine the methods for extraction and processing ores. For instance, harder minerals may require specialized equipments to mine or process.

2. Gemology

In gemology, hardness plays a vital role in determining the durability of gemstones. A gemstone's hardness indicates its resistance to scratches, which evaluating its suitability for jewellery.

3. Identification of minerals

The Mohs Hardness Scale is often used by mineralogists to help identify unknown minerals in the field. It's a quick and efficient way to classify rocks and minerals based on their scratch resistance.

4. Material science

The scale is also important in material sciences, where hardness is a key factor in determining the suitability of materials for various applications, such as cutting tools etc.

Mineral	Mohs Hardness	Image
Talc	1	
Gypsum	2	
Calcite	3	
Fluorite	4	
Apatite	5	
Feldspar	6	
Quartz	7	
Topaz	8	
Corundum	9	
Diamond	10	

DID YOU KNOW?

The ocean is major source of oxygen.

Title: Deccan Traps: India's Own Volcanic Wonderland

- Isha Talukdar

(B.Sc. 4th semester)

When I first read about the Deccan Traps, I was stunned to realize that India often celebrated for its rivers, monsoons, and mountains but it is also home to one of the greatest volcanic features on the planet.

Geological Extent and Thickness

The Deccan Traps covers an area of 500,000 sq.km in the western and central India and it is spread across parts of Maharashtra, Madhya Pradesh, Gujarat, and Karnataka, and are not like the volcanoes we see in disaster movies. You won't find lava-spewing cones here. Instead, they are vast layers of solidified basalt, stacked over millions of years like a natural staircase hence the term "traps," from the Swedish word trappa, meaning steps. Geologists estimate that these traps began forming around 66 million years ago, during the late Cretaceous period. According to Geology of India by Ramakrishnan M, the volcanic activity was not a one-time explosion, but a series of massive outpourings of lava that might have lasted hundreds of thousands of years.

Mauna Loa is the world's largest volcano.

Stratigraphic Classification

The Deccan Traps are stratigraphically divided into three major subgroups:

- Kalsubai Subgroup: The oldest sequence characterized by early basaltic flows.
- Lonavala Subgroup: Represents intermediate lava flows with distinct lithological features.
- Wai Subgroup: The youngest sequence, comprising the final phases of volcanic activity. These subdivisions help in understanding the chronological sequences of eruptions and associated geological processes.

Paleoclimatic Impact

One of the most fascinating and sobering connections made in modern research is between these volcanic eruptions and the extinction of dinosaurs. Studies, including those referenced in The Sixth Extinction by Elizabeth Kolbert, suggest that the gases released especially Sulphur dioxide and carbon dioxide may have caused severe climate disruptions, acid rain, darkened skies, and cooling temperatures would have devastated ecosystems globally.

Economic Significance

The Deccan Traps aren't just a story of destruction. The weathering of basaltic rocks led to the formation of fertile black cotton soil, which supports major agricultural belts mainly for cotton cultivation. Additionallly, the region is rich in mineral resources including manganese, iron ore and bauxite contribution to India's mining industry. Sites like Lonar Crater in Maharashtra, formed by a meteorite impact on basalt rock, offer rare geological phenomena studied by scientists around the world

Fig. DECCAN TRAPS

conclusion

What struck me most during my reading was how little we celebrate this ancient wonder. In a land so proud of its heritage, the Deccan Traps often go unnoticed. Yet, they are a part of our geo heritage a window into Earth's deep past and a natural monument of epic proportion.

DID YOU KNOW?

Seismographs detect ground motion

Earth Through the Ages

A Journey Across 4.6 Billion Years of Change

- Avoy Das

(B.Sc. 4th semester)

Ever wondered how the Earth got its present form and how it evolved through time? The Earth we stand on has a deep, dramatic past —an epic saga that began 4.6 billion years ago with fire and chaos, and continues to evolve beneath our feet today. In this edition of Geo Scope, I will take you on a time-traveling adventure through the grand chapters of Earth's story.

The Hadean Eon (4.6–4.0 Billion Years Ago)

The Fiery Birth Earth's story starts not with gentle beginnings, but with a violent bang. The Hadean Eon— named after Hades, the Greek god of the underworld—was a hellish time. The newborn planet was a molten sphere, bombarded by asteroids and under constant volcanic eruption. There were no oceans, no continents, and definitely no life—only lava, toxic gases, and constant collisions. Yet even in this chaos, something remarkable happened: the formation of Earth's core, crust, and early atmosphere.

The Archean Eon (4.0–2.5 Billion Years Ago)

Water Arrives, Life Begins This is the eon where things start cooling down —literally. Water condensed and began forming vast oceans. The crust solidified enough for proto-continents to rise. And most stunning of all, the first signs of life appeared in these waters—tiny single-celled organisms like cyanobacteria that

would one day change everything. These microbes released oxygen through photosynthesis, gradually transforming Earth's toxic atmosphere into one that could support future life. It was slow... but revolutionary. Image: Earth during the time of its formation

Image: Earth during the time of its formation

The Proterozoic Eon (2.5 Billion–541 Million Years Ago)

Oxygen, Ice, and Innovation

The Proterozoic is sometimes called "the boring billion" due to its slow pace of biological evolution—but don't be fooled. This era saw one of Earth's most dramatic makeovers: the Great Oxygenation Event. Oxygen levels rose, paving the way for more complex life forms. This was also the era of "Snowball Earth," when the entire planet may have frozen over. But Earth bounced back, and by the end of this eon, multicellular life was beginning to bloom.

The Phanerozoic Eon (541 Million Years Ago–Present)

Explosion of Life

Now things really get exciting.

Paleozoic Era

From trilobites crawling along ocean floors to the rise of the first land plants and vertebrates, life flourished. Massive forests took root, and insects grew to the size of birds. But it ended with the largest extinction event in Earth's history—The Great Dying—wiping out over 90% of marine species.

Mesozoic Era

Cue the dinosaurs! This was the age of reptiles, from the towering Tyrannosaurus rex to the flying Pterosaurs. It ended 66 million years ago when a giant asteroid collided with Earth, sparking mass extinction and reshaping the planet.

Cenozoic Era

Mammals rose from the ashes. Continents took their modern shapes. Humans appeared just moments ago on the geologic clock—barely a blink. Yet in this short time, we've drastically altered Earth's surface, climate, and ecosystems.

Final Thoughts: Our Place in the Timeline

Earth is not just a planet—it's a storyteller. Every mountain range, every fossil, every ocean trench is a page in its massive chronicle. When we study geology, we're not just looking at rocks—we're reading the planet's diary.

As stewards of this ancient world, understanding Earth's past is essential to shaping a sustainable future.

What will the next chapter hold?
Only time—and geology—will tell.

RECENT DISCOVERIES IN GEOLOGY

By A. Shravani Kameshwari
(B.Sc. 4th Semester)

Old Rocks Found Deep Under The Sea

Scientists recently uncovered a massive slab of ancient seafloor buried under the Pacific Ocean. Believe it or not, these rocks are over 250 million years old, dating back even before the first dinosaurs appeared on Earth! This rock is buried 410 to 660 kilometers beneath the ocean's surface, slowly moving toward the Earth's mantle.

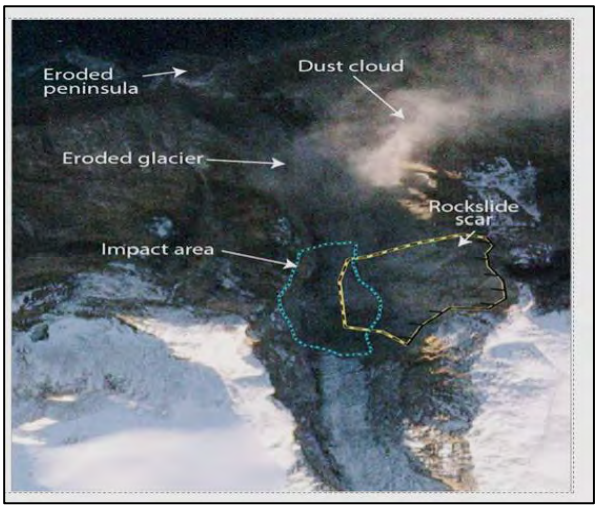
Massive landslide in Greenland creates strange seismic waves

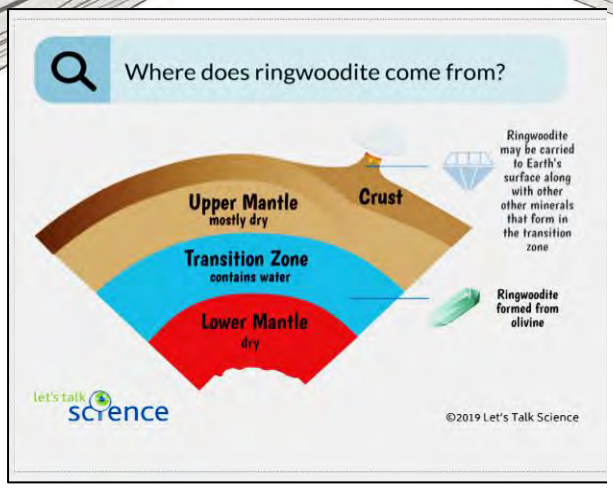
In 2023, scientists detected a weird, persistent noise that seismologists couldn't explain. Fast forward to 2024, and they've discovered the cause: a huge landslide in Greenland's Dickson Fjord. This landslide triggered a tsunami that caused waves to bounce back and forth in the fjord for days, generating a strange humming seismic sound.

Scientists discover gigantic ocean 700 km beneath the Earth's surface

Scientists have identified a massive reservoir of water deep within the Earth's mantle, encased in a mineral called ringwoodite. Ringwoodite is a mineral that forms under high pressure and temperature conditions in the Earth's mantle.

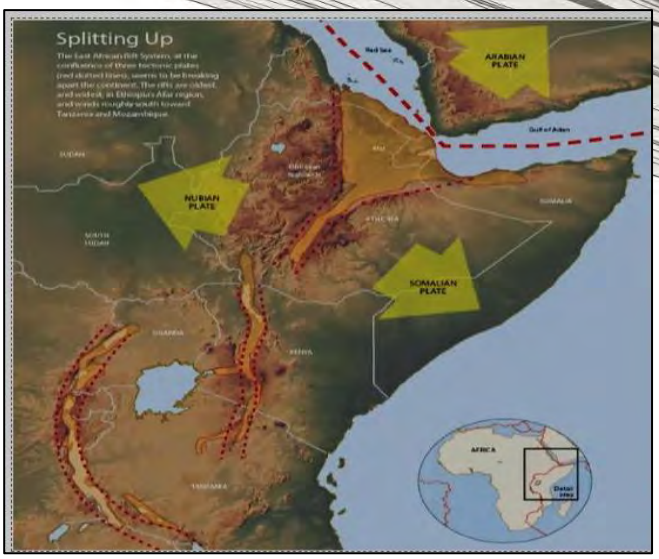
Gallery





Could Africa soon split in two? The bizarre scientific theory, explained GPS measurements show that across the East African Rift, the Nubian and Somali plates are diverging at an average rate of 7mm (0.2in) per year, slowly pulling the continent apart. Today, the rift remains above sea level, but as it widens, the land within the valley will sink. Eventually, oceanic waters could flood in, separating the entire Horn of Africa from the mainland. Earthquakes might help create gold nuggets Gold has always had its mysteries—where does it come from deep beneath Earth? Scientists believe they've found a new clue: earthquakes. While gold usually forms slowly over time in cracks within Earth's crust, scientists now think that earthquakes could speed up the process. How? Earthquakes can cause electrical charges in minerals like quartz, which might help tiny fragments of gold stick together, forming larger gold nuggets. If this theory proves correct, it could change everything we know about how gold is formed and mined. iStock In 2024, significant rare earth mineral discoveries included the identification of two new minerals, Oboniobite and Scandio-fluoroeckermannite, at the Bayan Obo mine in China, along with the announcement of Europe's largest rare earth deposit in Norway.

Gallery



DID YOU KNOW?

Some rocks can bend without breaking under intense heat and pressure - this process is called ductile deformation.

Volcanism

By Rikshita laskar

(B.Sc. 2nd semester)

We often hear the term volcano and hence volcanism. What actually is a 'volcano'? How does it form? Let us here learn what a 'volcano' is and the reason behind its occurrence. A volcano is commonly defined as a vent or fissure in the crust of a planetary-mass object, such as Earth, that allows hot lava, volcanic ash, and gases to escape from a magma chamber below the surface. The earth's lower crust and mantle contains a hot viscous molten material called magma. It is not entirely liquid, but a combination of liquid solid and gases. As it comprises many early formed crystals, it is slushy and it flows in a slow and sluggish manner. Magma generation within the earth is a result of complex interaction of increase in temperature, decrease in pressure, and addition of water. Once magma has been generated it, being lighter than the adjoining rocks, moves upward towards the surface. In the process it can either solidify below the surface or break the surface open and start erupting on the surface. when magma comes out of volcanic vents it is called as lava. Physical products of volcanism include volatiles, liquids and solids. Explosive volcanic eruption generates large volumes of gases and hot but solid rock fragments. Rapid gas expansion solidifies the rock fragments. The resulting mixture of hot, solid particles and gas, either may be blown upwards as huge ash clouds or avalanche rapidly flowing downslope as a fluidised flow. Why some volcanoes erupt violently? Volcanoes may explode violently, or lava may flow out at the surface rather quietly. A single volcano may erupt explosively at one time and quietly at another; but in many volcanoes, one type of activity or the other predominates. The explosive activity of a volcano depends upon the amount of gas in the magma beneath it and the manner in which that gas escapes. An explosion cannot occur unless gas is abundant and has been trapped to build pressures to the bursting point. Much of these gasses was formerly dissolved in the magma below the volcano

As magma cools, different minerals crystalize from the molten solution, but dissolved gases tend to be excluded from such mineral grains. Hence, the volume of liquid material in the magma body dwindles steadily as the gas content becomes too great, gas bubble separates from the melt and stream upwards in the magma chamber to zones of lower temperature and pressure near its roof. As the gas expands it forces the lava upward to the surface through cracks. If the magma is viscous or if the volcanic vent has been plugged by solidification of one's molten material, the gas cannot escape and pressure increase until an explosion occurs. To illustrate, limestone or calcium carbonate may add much carbon dioxide gas in this manner. Thus, the eruptive action of a volcano may change during its lifetime because the composition, temperature and amount of dissolved gases and magma are all variable factors. Volcanoes are diverse! They range from the majestic Mount Rainier, to colossal shield volcanoes like Mauna Loa (Hawaii Volcanoes National Park), and to volcanic fields that can cover hundreds of square miles such as at Craters of the Moon

National Monument. Volcanic activity is, undoubtedly, one of the greatest threats to life on earth, and strange although it may sound, there would be no life on earth without it, for the water brought from the earth's interior by volcanic activity has allowed the creation of hydrosphere and atmosphere and has also been responsible for the evolutionary process of life.

ENSO AND IT'S EFFECT ON INDIAN MONSOON ENSO:

By Dhritiraj Talukdar

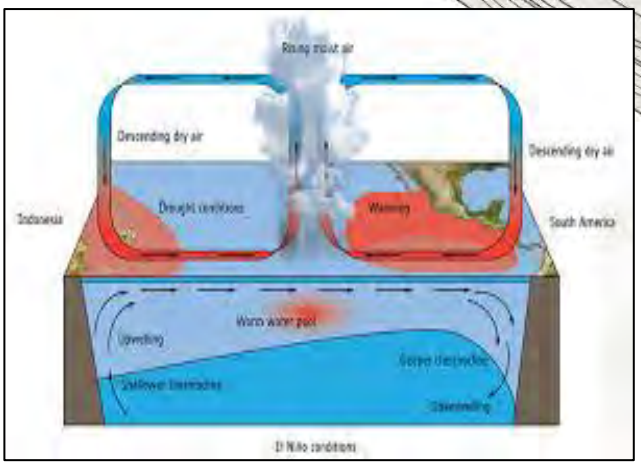
(B.Sc. 2nd semester)

The El Nino-Southern Oscillation (ENSO) is a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean. On periods ranging from about three to seven years, the surface waters across a large swath of the tropical Pacific Ocean warm or cool by anywhere from 1°C to 3°C, compared to normal. This oscillating warming and cooling pattern, referred to as the ENSO cycle, directly affects rainfall distribution in the tropics. El Nino and La Nina are the extreme phases of the ENSO cycle; between these two phases is a third phase called ENSO-neutral.

EL NINO:

El Nino is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Nino is the "warm phase" of a larger phenomenon called the El Nino-Southern Oscillation (ENSO). During El Nino, the trade wind coming from the east becomes weak or may even reverse its direction. During El Nino the water becomes warmer than normal formed over the central Pacific and moves towards eastern side rather than moving towards west and get accumulated near South American coast. High pressure system formed during the normal neutral phase get replaced by strong low-pressure system produced during El Nino year. This results in above average rainfall in Eastern Pacific, but below average rainfall in Western Pacific. The greatest impact of this warm phase can be felt over inland eastern Australia, Philippines, Indonesia, Malaysia and India where drought like situation may prevail.

Fig: El-nino conditions



LA NINA:

La Nina is a climate pattern that describes the cooling of surface-ocean waters along the tropical west coast of South America. During La Nina events, trade winds are even stronger than usual, pushing more warm water toward Asia. Off the west coast of the Americas, upwelling increases, bringing cold, nutrient-rich water to the surface. These cold waters in the Pacific push the jet stream northward. This tends to lead to drought in the Eastern Pacific and heavy rains and flooding in Western Pacific particularly in Southeast Asia and Australia. The increase in rainfall benefits agriculture in some areas but also potentially causes floods and other weather-related disaster.

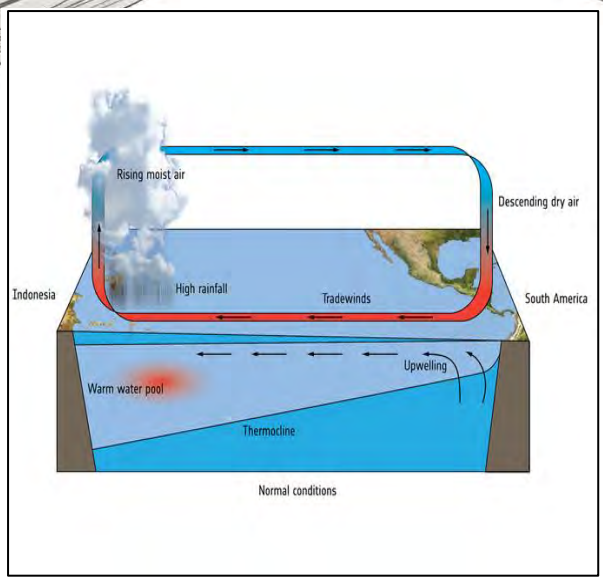


Fig: La-nina conditions

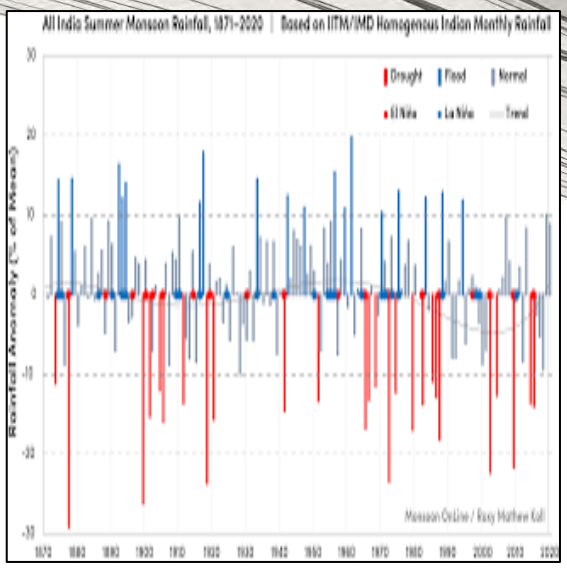


Fig: 153 years of All India summer monsoon rainfall (1871–2023).

EFFECT OF ENSO ON INDIAN MONSOON:

El Nino Southern oscillation (ENSO) associated events can have a significant impact on the Indian monsoon. During El Nino year or warm ENSO phase, warming in the central and eastern equatorial Pacific takes place which alters atmospheric circulation, affecting moisture transport and rainfall distribution over the Indian subcontinent. This leads to decreased rainfall and drought like conditions in some parts of India. El Nino events cause change in atmospheric patterns which disrupt monsoon dynamics, influencing the timing, duration and amount of rainfall received across India. Under such influences some region may experience below average rainfall while some regions may experience above average rainfall. El Nino events also have an impact on temperature patterns and wind circulation over the Indian subcontinent.

On the other hand, during La Nina year or cold ENSO phase, cooling in the central and eastern equatorial Pacific takes place which results in formation of lower than normal air pressure over the Pacific Ocean. This contributes to increased rainfall linked with the Indian summer monsoon rainfall (ISMR), particularly in northwest India and Bangladesh. This benefits the Indian economy in general, as agriculture sector mostly rely on the monsoon rainfall.

DID YOU KNOW?

Venus is the planet named for the Roman Goddess of love and discovered parts of its rocky surface that move in patterns similar to ocean pack ice .

Oceanography

- Dibyakansha Sarmah

(B.Sc. 4th semester)

Covering more than 70% of Earth surface, the oceans are not just vast bodies of water- but also they are vast dynamic systems that shape our planet's climate, support countless forms of life and hold many unsolved mysteries that still remains unexplored. Moreover the majority of life on Earth is aquatic and only 5% of the ocean has been explored.

What lies beneath the shimmering surface of our oceans? Oceanography seeks to answer all the mysteries by exploring the oceans physical, chemical, biological and most importantly geological aspects.

From providing half the oxygen we breathe to regulating Earth's climate it plays a crucial role.

Oceanography is the scientific study of the oceans- their compositions, movement, ecosystems, and geology. It covers everything about the oceans from the world's longest mountain range in underwater to the tiny plankton floating at the surface.

The main branches of Oceanography are:

♦Physical Oceanography.
♦ Chemical Oceanography.
♦ Biological Oceanography.
♦Geological Oceanography.

♦ Physical Oceanography: It is the study of physical conditions and physical processes within the ocean, especially the motions and physical properties of ocean waters. Physical oceanography may be sub-divided into descriptive and dynamical physical oceanography. Descriptive physical oceanography seeks to research the ocean through observastions and complex numerical models, which describe the fluid motions as precisely as possible whereas dynamical physical oceanography focuses primarily upon the processes that govern the motion of fluids with emphasis upon theoretical research and numerical models. Some key aspects are:

Ocean circulation: Studies large-scale movement of ocean water surface currents, deep-water currents. Important systems are Gulf Stream, Antarctic Circumpolar Current, etc.

Waves: Formation and behavior of ocean surface waves caused by wind, seismic activity (tsunamis)and tides. Includes study of wave dynamics, breaking waves and wave energy.

- Sea-ice and Polar Oceans:- Studies ice formation, melting and movement which is important for global climate and ocean circulation.

Fig: - Study of physical conditions and processes.

* Chemical Oceanography: - It is the study of the chemistry of seawater and the chemical interactions between the ocean, atmosphere, seafloor and marine life. The field of chemical oceanography has evolved over the past from one discovery to an interdisciplinary science. It explores how elements and compounds move through

the ocean, how they interact with marine organisms and the influence on it by both natural processes and human activity.

¬ Some key aspects are: -

¬ Seawater composition: - Understanding the salts, minerals gases like oxygen and carbon dioxide and nutrients dissolved. It's mainly composed of major ions like sodium, chloride, magnesium, sulphate, calcium, potassium including other trace elements and nutrients. ¬ Carbon cycle: - How oceans absorb, store and release carbon dioxide (CO_2), affecting global climate.

¬ Ocean Acidification: -How increasing CO_2 makes oceans more acidic, affecting marine life like corals and shellfish.

♣ Biological Oceanography: - It is the scientific study of the oceans. It encompasses the life within the ocean, the ocean floor and have they been affected by climate, weather, physical and chemical environment. It examines everything from microscopic plankton to large marine mammals, investigating their populations, distribution and the processes that drive their abundance and variation. It mainly focuses on how marine organisms interact with the ocean environment.

¬ Some key aspects: -

¬ Marine organisms: - Study of marine organisms from tiny plankton to huge whales where plankton are the foundation of the ocean food web. Scientists study how planktons grow, move and survive and energy moves from tiny plankton to big predators like whales i.e. food chain and food webs.

¬ Biochemical cycles: - How marine life help cycle elements like carbon, nitrogen, and oxygen through the ocean.

¬ Ocean climate interactions: - How marine organisms (especially plankton) affect and are affected by climate and carbon dioxide levels.

Fig: -Marine organisms beneath the ocean.

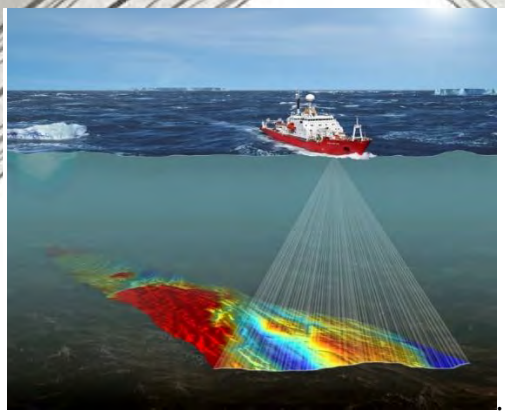
♣ Geological Oceanography (also called marine geology): - It is the study of the structure, features, and history of the ocean floor. It is the sub-discipline of oceanography that focuses on the structure, composition and processes. It is the study of Earth beneath the oceans, specifically the structure, history and processes of the ocean floor and coastal areas.

¬ Some key aspects: -

¬ Plate tectonics and sea-floor spreading: - Study of how Earth's lithospheric plates move and create new oceanic crust at mid-ocean ridges which helps explaining earthquakes, volcanoes, and ocean basin formation.

¬ Marine sediments: - Analysis of sediments (mud, sand, biogenic particles) that accumulate on the seafloor. It reveals Earth's past climates, ocean currents, and biological activity.

¬ Seafloor Morphology: - Mapping and studying the shapes and structures of the ocean floor i.e. mid-ocean ridges, abyssal plains, trenches, and seamounts (underwater mountains)



. Fig: Seabed sonar mapping

Global atmospheric circulation

By Rupsi Barik

(B.Sc. 2nd semester)

Global Atmospheric Circulation is the movement of air around the planet. It explains how thermal energy and storm systems move over the Earth's surface.

Without the Earth rotation, tilt relative to the sun, and surface water, global circulation would be simple. With the Sun directly over the equator, the ground and atmosphere there would heat up more than the rest of the planet. This region would become very hot, with hot air rising into the upper atmosphere. This would create a constant belt of low pressure around the equator. That warm air would then move directly north toward the poles, where it would become very cold and sink, creating a large area of high pressure. The temperature and pressure difference would return the now-cold air south to the equator (above right), creating a simple global circulation.

Hadley Cell Circulation

George Hadley (1685–1768) explained global winds by identifying that warm equatorial air rises and cold polar air sinks, creating a circulation cell.

On a rotating Earth, the Coriolis effect deflects airflows, creating distinct pressure belts: low pressure at the equator (Intertropical Convergence Zone, ITCZ) and high pressure at about 30° north and south (subtropical highs).
The Hadley cells dominate tropical and subtropical wind systems.

Global Wind Systems

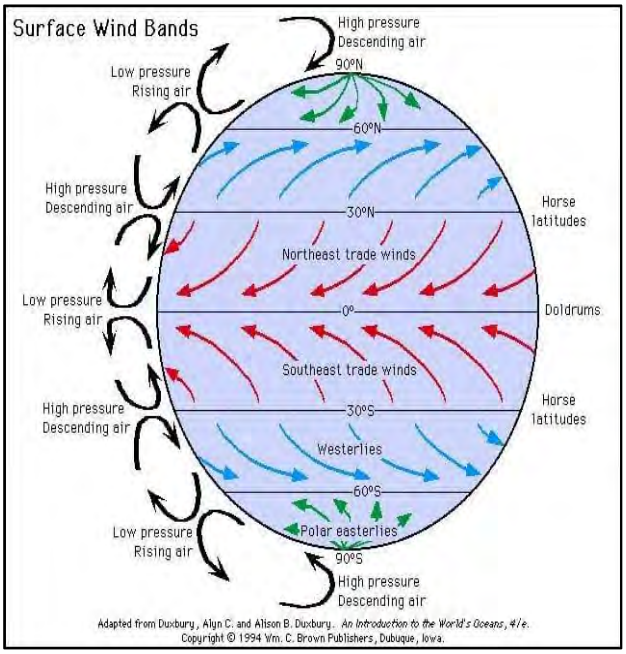
Hadley Cells: Warm air rises at the equator, moves poleward, cools and descends around 30° latitude.

Ferrel Cells: Located between 30° and 60° latitude, where surface winds (westerlies) dominate.

Polar Cells: Cold air sinks at the poles and flows outward as polar easterlies.

The Polar Front, Rossby Waves, and Jet Streams
At around 60° latitude, polar easterlies meet the westerlies at the polar front, creating instability and storms.

Rossby waves are large undulations in the polar front jet stream, **significantly influencing weather patterns.**



Two main jet streams:

Polar front jet stream:
Strong winds caused by the steep pressure gradient near the polar front.

Subtropical jet stream:
Formed at higher altitudes over the Hadley cells, also westerly but less dominant in weather control compared to the polar front jet.

Facts:
Land and sea distributions affect local wind patterns, leading to phenomena like monsoon.

1. *I crack the ground, I make it shake,*

Hold on tight — I'm no mistake!

What am I?

Answer: An earthquake.

2. *I fall from the sky as tiny rocks,*

But I didn't come from Earth's own stocks.

What am I?

Answer: Meteorite.

3. *I'm born in volcanoes, shiny and black,*

Cool me fast, and I'll never crack.

What am I?

Answer: Obsidian.

4. *I'm water's frozen cousin, slow but strong,*

I shape the land as I move along.

What am I?

Answer: Glacier.

5. *I'm soft as mud when I begin,*

But harden into stone over time within.

What am I?

Answer: Sedimentary rock.

6. *I melt, I cool, I break, I mend,*

Through rock's long journey, I never end.

What am I?

Answer: The rock cycle.

7. *I'm born of fire, from deep below,*

Cool and hard, I start to show.

Sometimes smooth, sometimes rough,

Breaking down is kind of tough.

What am I?

Answer: Igneous rock.

"Petroleum – The Black Gold and the Birth of Oil Fields in India"

The word, "Petroleum" comes from two Latin words- "Petra" (meaning Rock) and "Oleum" (meaning Oil). Petroleum is a naturally occurring dark colored Oily substance which is highly inflammable in nature. It occurs in the three different states in nature– Solid, Liquid and Gaseous.It takes millions of years to originate, migrate and further accumulation into pools of Oil and Gas.

In India, the earliest recorded evidence of Oil dates back to the year 1825. It was along the River- Burhi Dihing where Oil first showed up at Supkhong in Upper Assam. Later in the year, 1865, during his visit, H.D Medlicott from the Geological Survey of India encountered Oil shows and suggested that measures need to be taken to obtain Oil from the Makum - Namdang structure of Margherita. Accordingly few wells came up from where Oil was obtained. Years later in 1881-82, the Assam Railways and Trading Company while constructing Railway line from Dibrugarh to Ledo, noticed Oil near its working sites. They observed a black sticky substance in the feet of the Elephants which were used to carry the construction materials amidst the dense Jungles. There it all started with, DIG! BOY! DIG! , words used by Mr. W.L. Lake and in the year 1889-90, The Digboi Oil Field took its Birth in India.

The Assam Oil Company took over the Digboi Oil Field. At first ,14 Wells came up which produced almost 14,000 gallons per day. Later the Burmah Oil Company using various modern techniques was able to increase the production to 180,000 gallons /day. Even after decades, The Digboi well No 1 produces oil though few litres a year.

After the discovery of the Digboi Oil Field (1889) in Upper Assam, the Nahorkatiya Oilfield (1953), Moran Oilfield (1956), Geleki Oilfield (1968), Rudrasagar Oilfield (1960-66), Badarpur Oilfield (1915) in the Surma Valley and many others were carried out .At present there are hundreds of Oil field within the entire Assam-Arakan Basin. The Assam – Arakan comprises parts of Assam, Arunachal Pradesh, Nagaland, Mizoram, Manipur and Tripura along with its westward and eastward extensions. There were several other discoveries within the Mumbai Basin, Bengal Basin, Cambay Basin, Krishna - Godavari Basin, etc in the other parts of the country.

Petroleum, being a non-renewable resource needs to be taken care of.The present world thrives on this very valuable natural resource .Right from its domestic use (LPG, Kerosene,etc) to its use in automobile engines, to road making (Bitumen, Asphalt), Petroleum and its by-products are being used to a great extent across the whole World.

Us-Humans have to bear the consequences if we do not use it in rightful manner.

Petroleum – The Black Gold is a Precious gift to the World we live in.

NAFISA SHAMEEM RAHMAN

Guest Faculty

Department of Geology

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Bordoisila: The Pre-Monsoon Storms of Northeast India

Introduction: In the culturally rich and ecologically vibrant region of Northeast India, particularly in Assam, the arrival of Bordoisila is a dramatic and much-anticipated event. In addition to being a meteorological phenomenon, these seasonal pre-monsoon storms, which are characterized by strong winds and thunderstorms, are also an important cultural symbol, deeply rooted in local folklore and tradition that signifies the arrival of spring and the pre-monsoon season. More importantly, they act as a precursor to the Southwest (SW) Monsoon—India's most significant meteorological phenomenon. In simple words, these storms occur due to the rapid heating of the land, creating low-pressure zones that pull in moist air from the Bay of Bengal, resulting in sudden and violent weather events.

Traditional Beliefs and Cultural Symbolism of Bordoisila: In Assamese folklore, Bordoisila is portrayed as a woman spirit or goddess. Popular mythology claims that she is the daughter of Assam, who was married off to a man in a distant land. Every spring, she returns to her parent's house and her return is marked by strong, violent winds and thunderstorms. As she leaves, the winds follow again, creating a cycle of stormy visits that is both symbolic and meteorologically significant. This story offers a poetic and human touch to what would otherwise normally be a terrible natural event. It also reflects the deep connection between the people of Northeast India and the forces of nature.

Bordoisila and the Southwest (SW) Monsoon (A Climatic Connection): The Southwest Monsoon, which begins its advance over India in early June, is preceded by a series of atmospheric events termed as the pre-monsoon season. One such significant event is the occurrence of Bordoisila, which serves as a weather pattern transition between the dry winter months and the rainy SW monsoon season. Most parts of India receive its annual rainfall due to the Southwest Monsoon, a large-scale seasonal wind system that typically lasts from June to September. It plays an essential role in the general ecological balance, agriculture and water supply to the Indian subcontinent.

The term monsoon implies seasonal winds which can be considered as large-scale land and sea breezes that reverse direction with seasons—blowing from sea to land in summer (SW monsoon) and land to sea (NE monsoon) in winter (Figure 1). This phenomenon is most prominent in the Indian subcontinent, giving rise to the Indian Monsoon. The Southwest monsoon brings heavy rainfall due to low pressure over the Tibetan plateau, while the Northeast monsoon, driven by high-pressure zones, brings rain mainly to southeastern India. Countries like India, Bangladesh, and Myanmar rely heavily on the southwest monsoon for most of their annual rainfall. The mechanism of SW monsoon is primarily driven by the

differential heating of land and sea. During the summer months, the Indian landmass heats up rapidly, especially over the Tibetan Plateau, creating a strong low-pressure zone. In contrast, the surrounding Indian Ocean remains relatively cooler, maintaining a high-pressure area. This pressure difference causes moisture-laden winds to blow from the southwest, moving from the ocean toward the land. As these winds travel over the Arabian Sea and the Bay of Bengal, they absorb large amounts of moisture. When they hit the ground, particularly in high-lying areas like the Northeastern highlands and the Western Ghats, they rise, cool and condense to create clouds, which causes a lot of rain. The monsoon splits into two main branches: the Arabian Sea branch, which brings rain to the western coast and the Bay of Bengal branch, which travels toward Northeast India and then spreads Northwestward. The Tibetan Plateau also plays a crucial role by acting like a heat engine that helps pull in and sustain the monsoon winds. In addition to these, the position of the ITCZ and the subtropical jet stream, Indian Ocean Dipole (IOD) and El Nino phenomena all have an impact on the Indian monsoon.

Bordoisila, the powerful pre-monsoon windstorm typical to Assam and parts of Northeast India, is not just a weather event but a key atmospheric signal of the approaching Southwest Monsoon. It emerges due to intense atmospheric instability created by the rapid heating of the Indian subcontinent during late spring. This leads to the formation of low-pressure zones, which trigger strong convection activity—an essential precursor for monsoon development. These storms pull in moisture-laden winds from the Bay of Bengal, helping to saturate the lower atmosphere and contributing directly to the establishment of the monsoon trough, a key feature in the monsoon system. Moreover, Bordoisila brings a much-needed cooling effect, lowering land temperatures after extreme pre-summer heat, and creating more favourable conditions for sustained and widespread monsoon rainfall. In this way, Bordoisila acts as a natural transition phase, linking the dry heat of early summer to the life-giving rains of the Southwest Monsoon.

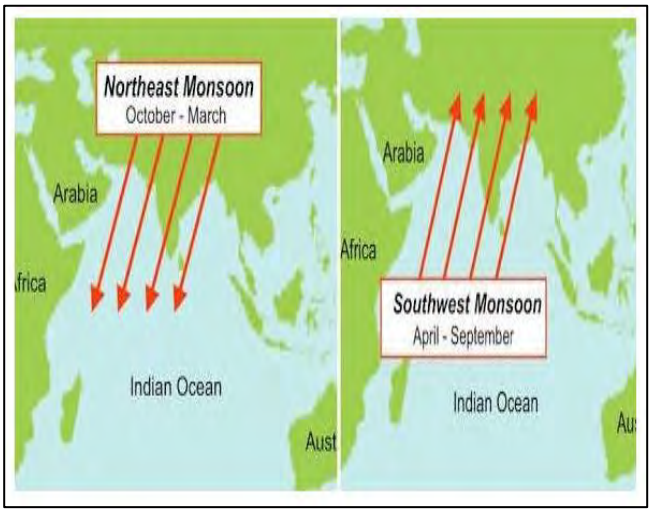

Figure 1: Northeast and Southwest Monsoon (Arrow marks indicate direction of wind)

Effect: Bordoisila has both positive and negative impacts on the region. It is characterized by strong winds, thunderstorms and heavy rainfall. On one hand, Bordoisila brings much-needed relief from the scorching heat, replenishes soil moisture and supports early agricultural activities. On the other hand, it often causes destruction—damaging houses, uprooting trees, disrupting electricity and communication lines and sometimes leading to loss of life and property. The storm also affects crops and tea gardens,

resulting in economic setbacks for farmers. Despite its destructive nature, Bordoisila holds cultural significance in Assam, often being linked with folklore and the celebration of Bohag Bihu, symbolizing seasonal change and renewal.

Conclusion: Bordoisila is more than just a seasonal wind—it is a symbol of nature's power, cultural identity and the resilience of the people who live in harmony with the rhythms of the land. As climate patterns shift, studying phenomena like Bordoisila becomes even more important, not only to predict extreme weather but also to preserve the traditional wisdom that has long coexisted with it.

Dr. Suman Saikia

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Basalt is the extrusive igneous rock found common on the surface of Mars

India's Ancient Connections with Antarctica: The Geological Narrative of a Drifting Continent

-By Sushmita Bhattacharjee (2017-2020 batch)

Earth, as it exists today, is the result of billions of years of geological evolution, tectonic activity, and continental drift. It is interesting to know how the landforms and landmasses that we see today were formed in the geological past. The incredible tale of how India now nestled between the mighty high Himalayas and the deepest Indian Ocean, was once a part of the icy continent of Antarctica is one of the fascinating facts that excites people today. Even more intriguing is the fact that certain areas in modern-day India, such as the Shillong Plateau and the Eastern Ghats, are believed to retain the geological signatures of this deep-time connection. To understand how and when India was once part of Antarctica, we must travel back 550 million years in time, when there were no continents, but the Earth contained a single enormous supercontinent, Gondwana. This supercontinent included not only India but also present-day continents, including Africa, South America, Australia, and Antarctica. Over millions of years, due to several tectonic forces acting on the Earth's surface, this landmass began to break apart and drift, thereby causing a gradual shift of India northward towards its current position. Gondwana was not only a massive landmass but also exhibited a rich and diverse environment, covered with forests, rivers, and seas. It is home to early forms of flora and fauna. India was located in the southern part of Gondwana, adjacent to East Antarctica.

At that time, the climate was very different, unlike today.

Approximately 180 million years ago, during the Jurassic period, tectonic forces began to rift Gondwana into separate continents. India began its dramatic journey northward, moving at a speed of up to 20 cm per year, one of the fastest tectonic movements ever recorded. As it drifted away from Antarctica and Madagascar, India crossed the equator and eventually collided with the Eurasian plate, leading to the formation of the youngest folded mountains, the Himalayas. During this journey, India carried fragments of the original Gondwana crust, some of which remain identifiable today in the form of ancient rocks and geological formations. In India, there are mainly two regions, one in the northeastern part of India and one along the east, which preserve geological evidence that establishes a link between India and Antarctica. These are the Shillong Plateau in the northeast and Eastern Ghats along the east coast. Their rock compositions, mineral assemblages, and structural features closely resemble those found in the East Antarctic region. The Shillong Plateau, which is present in northeastern India, is separated from peninsular India by the Garo-Rajmahal Trap. The plateau preserved rocks from the Precambrian to the present. These rocks, especially those belonging to the Precambrian, have been extensively studied to understand and correlate them with rocks present worldwide. Globally, the plateau has been correlated with the Pan-African orogeny, which occurred around 500 million years ago and extends from the Prydz Bay of East Antarctica through Western Australia. Isotopic investigations using U-Pb zircon dating and Nd isotopic analysis revealed that the crustal genesis of the Shillong Plateau aligns with the geological timeline of rocks found in Antarctica, suggesting a shared origin before continental breakup. The tectonic behavior of this region also hints at its Gondwanan heritage, which remained stable throughout much of the tectonic upheaval that affected other parts of the Indian subcontinent. This evidence not only supports the idea of a unified landmass, but also enhances our understanding of the tectonic processes that shaped these regions. Furthermore, it invites further investigation of the geological history of the Indian subcontinent and its connections to other ancient landforms. The Eastern Ghats Mobile Belt (EGMB) is another region that has strong links to Antarctica. Running parallel to the east coast of India, the EGMB is composed of high-grade metamorphic rocks and intrusive granites, similar in composition and age to the rocks found in the Rayner Complex of East Antarctica. Several geological studies have indicated that during the formation of Gondwana, the Eastern Ghats and Rayner Complex were part of the same crustal block. Later, during the fragmentation of Gondwana, this block split, and the Indian and Antarctic segments drifted apart. In fact, geologists use paleomagnetic data and rock structural correlations to "fit" the landmasses of Gondwana back together like a jigsaw puzzle, and these data show how the Eastern Ghats would have abutted parts of East Antarctica in the ancient past. Not only do the rocks speak of India's Antarctic heritage but fossil records also support this view. Fossils of the Glossopteris fern, a genus of seed ferns thriving in Gondwana, have been found in India, Antarctica, South America, and

Africa. These fossils offer strong biogeographic evidence that these continents were once connected. Similarly, coal deposits in central India and parts of Antarctica suggest that both regions supported lush, swampy forests in a temperate climate, starkly different from Antarctica's current frozen state. The story of India's journey from Antarctica to Asia is not a tale of geographical curiosity. This has important implications for our understanding of plate tectonics, continental drift, and mountain-building processes. By studying the geological similarities between India and Antarctica, scientists have gained insight into how continents rift, drift, and collide over millions of years. The formation of mountain ranges such as the Himalayas, seismic activity in the Indian subcontinent, and even patterns of mineral deposits can be traced back to these ancient movements.

Gondwana supercontinent during Proterozoic. (From Heron, P., 2019)

Correlation between the Eastern Ghats of Eastern India and Rayner Complex of East Antarctica. (Taken from Gupta et al., 2021)

DID YOU KNOW?

1.There are "singing" or "booming" sand dunes in some deserts- they emit deep hums due to grain vibration.

2. There are rivers of liquid rock beneath the Earth's crust, not just molten magma chambers.

3. Glaciers can move entire mountains.

Assam and Earthquakes: A Geological Perspective

The state of Assam, nestled in the seismically active Northeast India, lies at the forefront of the collision zone between the Indian and Eurasian tectonic plates. This tectonic setting places Assam in Seismic Zone V, the highest-risk category in India, making it prone to frequent and intense earthquakes. The region's seismic history, marked by events like the Great Assam Earthquake of 1950 (Mw 8.6), underscores the need to understand its geological framework to mitigate future risks.

Assam's seismic activity is driven by its location within the Eastern Himalayan Syntaxis (EHS), where the Indian plate converges with the Eurasian plate, forming the Himalayan fold-thrust belt. Major fault systems, including the Main Frontal Thrust (MFT), Main Boundary Thrust (MBT), and the Mishmi Thrust, accommodate the tectonic stress. Additionally, intraplate faults like the Kopili Fault and the Shillong Plateau's Oldham Fault contribute to the region's seismicity. The Brahmaputra Valley, a sediment-filled basin, amplifies ground shaking, increasing earthquake impacts.

The Eastern Himalayan Syntaxis is a complex tectonic junction where the Himalayan and Indo-Burman arcs meet, creating a unique stress regime. Research by Singh et al. (2021) highlights the role of the Mishmi Thrust in the EHS, noting its capacity for significant surface ruptures. The region's geology, characterized by folded Tertiary sediments and crystalline basement rocks, further complicates seismic wave propagation, as documented by Tandon (1954).

The 1950 Assam-Tibet earthquake, one of the largest recorded onshore earthquakes, struck on August 15 with a moment magnitude of 8.6–8.7. Its epicenter was located in the Mishmi Hills, and it caused widespread devastation across Assam and Tibet, claiming approximately 4,800 lives. The earthquake triggered massive landslides, altered river courses, and caused extensive liquefaction in the Brahmaputra Valley.

Paleoseismological studies by Singh et al. (2021) provide evidence of a surface rupture along the Mishmi Thrust during this event. Trenching at Kamlang Nagar revealed a dip-slip displacement of 24.6 ± 4.6 m on a 25 ± 5°E dipping fault. Radiocarbon

dating of charcoals (1111–914 B.C. to A.D. 1761–1968) confirmed the 1950 event as the most recent major rupture, suggesting a dual faulting mechanism involving both the Mishmi Thrust and the Himalayan Frontal Thrust. This dual rupture style, unique to the 1950 earthquake, underscores the complexity of Assam's tectonics.Tandon's (1954) study further details the earthquake's aftershocks, analyzing 54 events in the Assam region up to April 1951. Using data from stations like Tocklai, Tezpur, and Shillong, Tandon calculated seismic wave velocities and estimated crustal layer depths, comparing them with global standards by Jeffreys and Bullen (1940). These findings remain foundational for understanding Assam's subsurface structure.

Assam's seismic history includes other significant events, such as the 1897 Shillong earthquake (Mw 8.2–8.3), which uplifted the Shillong Plateau by about 11 meters. The 2021 Assam earthquake (Mw 6.0), centered near Dhekiajuli, was attributed to slip along the Kopili Fault, highlighting the ongoing activity of intraplate faults. Sukhija et al. (2008) investigated liquefaction features from the 1950 earthquake, identifying sand dikes and blows along the Burhi Dihing River. Radiocarbon dating constrained a 500-year paleoseismic record, linking some features to a 1548 AD event.

Assam's location in Seismic Zone V necessitates robust preparedness. The amplification of seismic waves in the Brahmaputra Valley's soft sediments increases damage potential, as seen in the 1950 earthquake's extensive liquefaction. Research by Sukhija et al. (2008) emphasizes the importance of paleoseismic studies to establish recurrence intervals, critical for updating building codes. Singh et al. (2021) suggest a slip deficit along the Mishmi Thrust capable of generating an Mw ~7.7 earthquake, urging proactive monitoring.

Public awareness and infrastructure resilience are vital. The National Centre for Seismology (NCS) monitors Assam's seismic activity, attributing recent tremors to active faults like the Kopili. Community-driven disaster management, as advocated by the Assam State Disaster Management Authority, can complement geological research to reduce vulnerability.

Assam's earthquake-prone nature is a direct consequence of its dynamic geological setting within the Eastern Himalayan Syntaxis. The 1950 Great Assam Earthquake serves as a stark reminder of the region's seismic potential, with research shedding

light on its complex fault interactions. By integrating geological studies with modern monitoring and preparedness, Assam can better navigate its tectonic challenges, safeguarding lives and infrastructure in this vibrant yet vulnerable region.

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ARYA VIDYAPEETH COLLEGE,
GEOLOGY DEPT.BATCH 2021-2024

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There are rocks that can float- pumice is a volcanic rock that is so porous it can float on water.

Embracing Python and Machine Learning in Earth Science: A Call to Future Geologists

Introduction

Geology, as a science rooted in observation and interpretation, has long relied on fieldwork, physical samples, and manual analysis to unravel the secrets of Earth's past, present, and future. However, the accelerating digital transformation across sciences is rapidly redefining what it means to be a geologist. The integration of Python programming and machine learning (ML) into Earth science offers transformative potential. Yet, many budding geologists still view these tools as peripheral rather than essential. This article aims to bridge that gap by demonstrating how Python and ML are not only beneficial but vital for modern geological research and industry applications.

Why Should Geologists Learn Python?

Versatility and Accessibility

Python is an open-source, general-purpose programming language known for its simplicity and readability. It supports numerous scientific libraries such as NumPy, Pandas, SciPy, and Matplotlib, making it perfect for data analysis, modeling, and visualization—all crucial in geological research.

Integration with Geoscientific Tools

Python seamlessly integrates with GIS tools (e.g., ArcPy for ArcGIS, GeoPandas for geospatial analysis) and remote sensing libraries (e.g., Rasterio, EarthPy). These capabilities allow geologists to process satellite data, generate maps, and conduct spatial analyses with ease.

Growing Industry Demand

Industries like oil and gas, mining, environmental consultancy, and climate modeling are increasingly relying on data-driven decision-making. Python proficiency significantly enhances employability and opens doors to interdisciplinary roles.

Machine Learning: A Game Changer

In Geology Machine learning, a subset of artificial intelligence, involves algorithms that can learn from and make predictions on data. It is revolutionizing Earth science in the following ways:

Predictive Modeling

ML models can predict natural hazards such as landslides, earthquakes, and floods with improved accuracy by learning from historical data. For instance, support vector machines (SVMs) and random forests are widely used in landslide susceptibility mapping.

Mineral Prospectivity Mapping

By training algorithms on known mineral deposits and geological features, ML can identify regions with high potential for new discoveries—significantly reducing exploration costs and time.

Seismic Interpretation

Deep learning models such as convolutional neural networks (CNNs) are increasingly being used to automate the interpretation of seismic data, aiding in hydrocarbon exploration and earthquake research.

Climate and Environmental Monitoring

ML is used to analyze large datasets from satellites and sensors to track changes in land cover, monitor pollution, and model climate change impacts.

Practical Applications and Case Studies

Volcanic Eruption Forecasting

Python-based models trained on geophysical signals from volcanoes can forecast eruptions with higher accuracy. For example, neural networks can analyze seismic, gas emission, and deformation data to predict eruptive activity.

Petroleum Reservoir Characterization

ML algorithms help interpret well log data to identify lithofacies, estimate porosity and permeability, and even model fluid distributions—all vital for effective reservoir management.

Core Image Analysis

Python scripts can automate the classification of rock types in core images using image processing libraries like OpenCV and machine learning models. This speeds up core analysis and improves consistency.

Groundwater Contamination Mapping

Random forest and k-nearest neighbors (KNN) algorithms are employed to model groundwater contamination based on spatial datasets and well measurements, helping manage water resources better.

Getting Started: A Roadmap for Geologists

Learn the Basics of Python

Start with data types, loops, functions, and object-oriented programming. Platforms like Codecademy, Coursera, and freeCodeCamp offer excellent beginner tutorials.

Explore Scientific Libraries

Familiarize yourself with NumPy (numerical operations), Pandas (data manipulation), Matplotlib and Seaborn (visualization), and Scikit-learn (ML algorithms).

Work on Geoscience Datasets

Use open datasets from USGS, NASA EarthData, or OneGeology. Practice with tasks like spatial analysis, geological mapping, or time-series modeling.

Take ML Courses Tailored to Earth Science

Some platforms offer specialized courses combining ML and geosciences. Examples include Earth Lab's Earth Analytics courses and The Coding Geologist's tutorials.

Build Projects and Collaborate

Start with simple projects—like classifying rock types or predicting rainfall. Share your work on GitHub, collaborate with peers, and seek feedback. The Future of Geology is Digital The Earth is a complex system, and understanding it requires powerful tools to manage, analyze, and visualize data. As the volume and variety of geological data continue to grow, the demand for geologists who can code—and do so meaningfully—will only increase. By embracing Python and machine learning, future geologists equip themselves with a modern toolkit to uncover Earth's mysteries, tackle pressing environmental challenges, and innovate in research and industry. The time to start is now.

Conclusion

Python and machine learning are not just trends, they are essential skill sets that define the future of Earth science. From mineral exploration and seismic analysis to environmental modeling and hazard prediction, these tools enhance our ability to understand and protect our planet. For aspiring geologists, learning Python is no longer optional it is an investment in relevance, capability, and future leadership in the geoscience domain. So pick up your rock hammer in one hand, and a Python script in the other. The future of geology is in both so I recommend every future geologist out there to start learning python and machine learning.

Darshan Swargiary

Arya Vidyapeeth college

Graduated in the year 2024.

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এটি কণমানি শব্দ

এটি শব্দই জন্ম দিলে অনেক শব্দ ।

কবিতা হ'ল অনেক কবিতা।

কণমানি শিশুটিৰ হাহিঁ।।হাতৰ পৰা
গিলাছটো পৰি অনেক টুকুৰা হ'ল

হেজাৰ কবিতাৰ জন্ম পালে

প্রতিটো টুকুৰাই যেন কবিতা।।

বিষাদৰ ডাৱৰত প্রতিটো টুকুৰাৰ খলকনি।
উমান উথিল বুকুৰ মাজত

মাথো এটি কণমানি শব্দ।।

জগদীশ কলিতা

ভূতত্ত্ব বিভাগ

আর্য্য বিদ্যাপীঠ মহাবিদ্যালয়
(স্বায়ত্তশাসিত)

পৰীক্ষাগাৰ সহায়ক

FACULTY MEMBERS

Our Teachers

From left to right

1. Satyajeet Sonowal (Guest faculty)

2. Dr. Dicton Saikia

3. Dr. Niva Rani Devi

4. Dr. Jonali Medhi

5.Dr. Swapnali Dutta

6. Nafisa Sameem Rahman (Guest faculty)

Our non-teaching staff (lab assistant)

From left to right

1. Jagadish Kalita

2. Pradip Deka

BATCHES

2ND SEMESTER

4TH SEMESTER

6TH SEMESTER

Achievers Gallery

2ND SEMESTER

Left to right

1.Tridip Saikia

2. Rasidul Ali

First prize in badminton (double's)

during college week

Irfan Habib

1. 3rd prize in arm wrestling

2. 3rd prize in relay race

During college week

4th SEMESTER

Arupam Bhat

1st Prize in Classical Music (Vocal) and Bhupendra Sangeet.

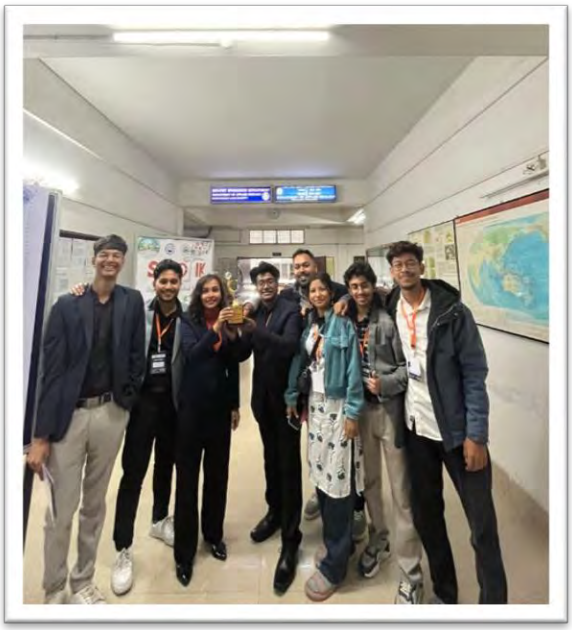
2nd Prize in Rabindra Sangeet, Bishnu Rabha Sangeet, Lokogeet, Parbati Prasad Sangeet, Semi Classical Song and Modern Song.

3rd Prize in Bongeet and Jayanta Hazarika Geet

Isha Talukdar

First prize in Cricket during college week(opening Batswomen) and Part of a team and 2 Times back to back Champion

6th semester



Students of 6th sem received first prize in rock identification in SPHOTIK, a geofest in Northeast India organised by Department of Geology of Dibrugarh University. 2025

Departmental Achievements and Activities

Award of excellence to Gunjan Deb for his academic excellence and for securing 115 rank in JAM.

Gunjan Deb got acknowledged for his performance in JAM by Principal Dr. Pradip Kumar Bhattacharyya.

Cultural rally 2024-25

The above two photos: Different events organised by Department of Geology in Conference Hall.

Department of Geology organized a clothing donation drive for those in need Parijat Academy (Pamohi).

Photo presented above: Students from Department of Geology in Pragjyotish college in students exchange program .

Conclusion

With the completion of our magazine, we conclude with deep gratitude on the collective efforts that made this journey of creating these pages possible. This magazine stands as a testament to creativity, collaboration and passion of all those who considered their ideas and talents. We hope that each page will spark curiosity for geo-science and provide moments of enjoyment for our readers. Thank you for being a part of our journey.

Wall Magazine