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G E O D E

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University Department of Geology, Ranchi University, Ranchi.

Estd:1962

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FEMALE GEOSCIENTISTS: A GIANT LEAP

On the auspicious occasion of **International Women's Day (8th March 2021)** it is an opportunity and our pious duty to acknowledge the role and contribution of women in the domains of Earth System Sciences. They have been largely under represented in the precious era before the eighteenth century. There has been a long history of women in the field of geology. Women in geology have been making astounding contributions to the scientific communities since 17th century. In the nineteenth century there emerged a professional class of geologists which included women. Many females in geology have proven their success in the office, field, and laboratory.

1600-1700 A.D.

Martine Bertereau (1642) - first recorded women mineralogist.

1700-1800 A.D.

Etheldred Benette (1776) - first recognised women geologist.

1800-1900 A.D.

Emma Hart Willard (1824) - published Ancient Geography.

Mary Austin Holley (1833) - published on Soils, Water Resource and Minerals.

Elizabeth Carne (1865) - first female fellow of the Royal Geological Society of Cornwall.

Mary Emilie Holmes (1889) - first female fellow of Geological Society of America.

Florence Boscom (1893) - considered as first women geologist in USGS with first Ph.D.

1900-2000 A.D.

Alice Wilson (1909) - first Canadian woman geologist.

Inge Lehman (1936) - concluded the Earth has a solid inner core distinct from its outer molten core.

Eileen Guppy (1943) - first female geologist appointed as scientific staff in British Geological Survey.

Moira Dunbar (1955) - first female glaciologist.

Elsa G. Vilmundardottir (1963) - first female Icelandic geologist.

Sue Arnold (1967) - first female of British Geological Survey to go on research vessel to sea.

Beris Cox (1969) - first female palaeontologist of British Geological Survey.

Audrey Jackson (1975) - female geologist allowed to continue service even after marriage.

Katsuko Saruhashi (1980) - first women elected to Science Council of Japan.

Janet Watson (1982) - first woman President of Geological Society of London.

Sudipta Sengupta and Aditi Pant (1983)-

First women to receive **Shanti Shwaroop Bhatnagar**

Award in the Earth Science Category.

2000 A.D. - contd.

Marica McNutt (2010) - first female Director of United States Geological Survey.

Maureen Raymo (2014) - first women to receive highest award of Geological Society of London.

Marcia McNutt (2016) - first women President of US National Academy of Sciences.

Chandrima Saha (2019) - first women as President of Indian National Science Academy.

It is satisfying to note that the women geoscientist population workforce in Geological Society of India stands as tall as more than 40% . The geo-science fields for women are strongly encouraging. Work force data trends indicate a quickly closing gender gap in all disciplines of geology. As more females pursue higher education in geology and its disciplines the community anticipates ratios at more than 50% in near future in public and private sectors. To our great satisfaction this department is privileged to have 75-80% population of total students intake per annum and 50% of the work force of teachers as women,

--- *Chief Editors' Desk*

“To be a good Geologist, you have to think broadly and see deep” -Mubariz Hassan

NEWS AND NOTES

1. An **MoU** between **Ranchi University** and **Zoological Survey of India** was signed on **2nd March, 2021** at University Department of Geology, Ranchi University in the presence of Vice-Chancellor, Registrar and Dean Student Welfare, Ranchi University, Ranchi



MoU Between ZSI and RU

2. International Women's Day as "**Women in Leadership: Achieving an equal future in a COVID-19 world**" was celebrated in the University Department of Geology on **8th March, 2021**.



International Women's Day Celebration

3. **Miss(Dr.) Anubha Tigga**, Geologist, Mines and Geology Jharkhand has given a **Ph.D. Viva-voce** on Topic: "*Geochemical Characterization of Coals of South Karanpura Coalfields with special Reference to their Environmental Impact*" under the **supervision of Prof. (Dr.) Uday Kumar**, Professor of Geology (Rtd.) Ranchi University at Dean's Conference Hall, Faculty of Science, Ranchi University on **8th March 2021**.



Ph.D. Viva Voce of Miss. Anubha Tigga

4. **Ph.D. - Pre-Submission Seminar** of **Mr. Shyam Lal Singh** on Topic: "*Geochemical Aspects of Soil Genesis and Study of Environment of Soil Composition due to Generation of Biomass through Chakuriya Vikash Pranati in parts of Palamu and Latehar District (Jharkhand)*" under the **supervision of Dr. P. K. Verma**, Associate Prof. & DSW/F.O on **10th March 2021** in Seminar Hall.

5. **Mrs. Munmum Maji**, Technical Assistant, CSIR CIMFR, Ranchi Regional Centre, Ranchi has presented the **Ph.D. Registration Seminar** on **12th March 2021**, on topic: "*Geochemical and Petrographical Studies on the Coal from Kharkharee Block, Jharia Coalfield to explore the feasibility as Coking Coal*" under the **supervision of Dr. Bacha Ram Jha** Asst. Professor, Legal Cell Incharge, Ranchi University.



MoU with ICAR-IINRG

6. **Dr. Bacha Ram Jha** Asst. Professor, has been **appointed as In-charge, Legal Cell**, Ranchi University on **15th March 2021**.

7. **MoU** Was signed Between **ICAR-IINRG** and **Ranchi University** on **17th March** the presence of Vice-Chancellor, Registrar and Geology Head of the Department, Ranchi University, Ranchi.

8. **World Water day** was Celebrated on **22nd March** in University Department of Geology in the presence of **Hon'ble Vice Chancellor Prof. (Dr) Kamini Kumar**.

9. **Dr. P. K. Verma**, Associate Prof. & DSW/F.O is superannuating on **31st March 2021**.



World Water Day 2021

GLOBAL

Traces of Earth's early magma ocean identified in Greenland rocks

New research led by the University of Cambridge has found rare evidence -- preserved in the chemistry of ancient rocks from Greenland -- which tells of a time when Earth was almost entirely molten.

The study, published in the journal *Science Advances*, yields information on an important period in our planet's formation, when a deep sea of incandescent magma stretched across Earth's surface and extended hundreds of kilometres into its interior.

It is the gradual cooling and crystallisation of this 'magma ocean' that set the chemistry of Earth's interior -- a defining stage in the assembly of our planet's structure and the formation of our early atmosphere.

Scientists know that catastrophic impacts during the formation of the Earth and Moon would have generated enough energy to melt our planet's interior. But we don't know much about this distant and fiery phase of Earth's history because tectonic processes have recycled almost all rocks older than 4 billion years.

Now researchers have found the chemical remnants of the magma ocean in 3.6-billion-year-old rocks from southwestern Greenland.

The findings support the long-held theory that Earth was once almost entirely molten and provide a window into a time when the planet started to solidify and develop the chemistry that now governs its internal structure. The research suggests that other rocks on Earth's surface may also preserve evidence of ancient magma oceans.

"There are few opportunities to get geological constraints on the events in the first billion years of Earth's history. It's astonishing that we can even hold these rocks in our hands -- let alone get so much detail about the early history of our planet," said lead author Dr Helen Williams, from Cambridge's Department of Earth Sciences.

The study brings forensic chemical analysis together with thermodynamic modelling in search of the primeval origins of the Greenland rocks, and how they got to the surface.

At first glance, the rocks that make up Greenland's Isua supracrustal belt look just like any modern basalt you'd find on the sea floor. But this outcrop, which was first described in the 1960s, is the oldest exposure of rocks on Earth. It is known to contain the earliest evidence of microbial life and plate tectonics.

The new research shows that the Isua rocks also preserve rare evidence which even predates plate tectonics -- the residues of some of the crystals left behind as that magma ocean cooled.

"It was a combination of some new chemical analyses we did and the previously published data that flagged to us that the Isua rocks might contain traces of ancient material. The hafnium and neodymium isotopes were really tantalizing, because those isotope systems are very hard to modify -- so we had to look at their

chemistry in more detail," said co-author Dr Hanika Rizo, from Carleton University.

Iron isotopic systematics confirmed to Williams and the team that the Isua rocks were derived from parts of the Earth's interior that formed as a consequence of magma ocean crystallisation.

Most of this primeval rock has been mixed up by convection in the mantle, but scientists think that some isolated zones deep at the mantle-core boundary -- ancient crystal graveyards -- may have remained undisturbed for billions of years.

It's the relics of these crystal graveyards that Williams and her colleagues observed in the Isua rock chemistry. "Those samples with the iron fingerprint also have a tungsten anomaly -- a signature of Earth's formation -- which makes us think that their origin can be traced back to these primeval crystals," said Williams.

But how did these signals from the deep mantle find their way up to the surface? Their isotopic makeup shows they were not just funnelled up from melting at the core-mantle boundary. Their journey was more circuitous, involving several stages of crystallization and remelting -- a kind of distillation process. The mix of ancient crystals and magma would have first migrated to the upper mantle, where it was churned up to create a 'marble cake' of rocks from different depths. Later melting of that hybrid of rocks is what produced the magma which fed this part of Greenland.

The team's findings suggest that modern hotspot volcanoes, which are thought to have formed relatively recently, may actually be influenced by ancient processes.

"The geochemical signals we report in the Greenland rocks bear similarities to rocks erupted from hotspot volcanoes like Hawaii -- something we are interested in is whether they might also be tapping into the depths and accessing regions of the interior usually beyond our reach," said Dr Oliver Shorttle, who is jointly based at Cambridge's Department of Earth Sciences and Institute of Astronomy.

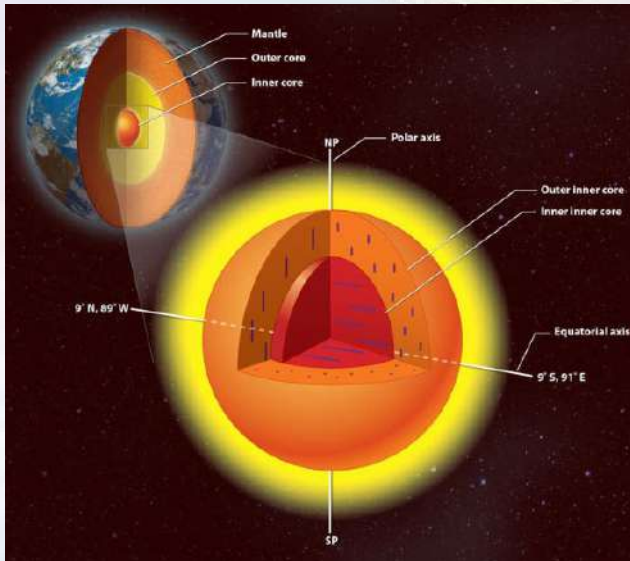
The team's findings came out of a project funded by Deep Volatiles, a NERC-funded 5-year research programme. They now plan to continue their quest to understand the magma ocean by widening their search for clues in ancient rocks and experimentally modelling isotopic fractionation in the lower mantle.

"We've been able to unpick what one part of our planet's interior was doing billions of years ago, but to fill in the picture further we must keep searching for more chemical clues in ancient rocks," said co-author Dr Simon Matthews from the University of Iceland.

Scientists have often been reluctant to look for chemical evidence of these ancient events. "The evidence is often altered by the course of time. But the fact we found what we did suggests that the chemistry of other ancient rocks may yield further insights into the Earth's formation and evolution -- and that's immensely exciting," said Williams.

Source: University of Cambridge

- **Geoscientists Confirm Existence of Earth's Innermost Inner Core**



The inner core of Earth has an inner core of its own, with crystals aligned in a different direction. Image credit: Lachina Publishing Services.

The Earth's solid inner core remains one of the most enigmatic parts of our planet, despite numerous studies in the fields of seismology, geodynamics, mineral physics and materials science.

Making up only 1% of Earth's total volume with a temperature of over 5,000 degrees Celsius, understanding the structure, current dynamics and evolution of the inner core is vital to understanding Earth's thermal history.

In particular, this provides insights to the geodynamo, without which life would not exist as we know it today.

"Investigating the structure of the inner core can help us understand more about the Earth's history and evolution," said study's lead author Dr. Joanne Stephenson, a researcher in the Research School of Earth Sciences at the Australian National University.

"Traditionally we've been taught the Earth has four main layers: the crust, the mantle, the outer core and the inner core."

"The idea of another distinct layer was proposed a couple of decades ago, but the data has been very unclear."

For the study, Dr. Stephenson and her colleagues from the Australian National University, Professor Hrvoje Tkalčić and Professor Malcolm Sambridge, used data from the International Seismological Centre (a database of seismic arrivals gathered from seismological institutions globally) in conjunction with the so-called 'neighbourhood algorithm.'

"We got around this by using a very clever search algorithm to trawl through thousands of the models of the inner core," Dr. Stephenson said.

"It's very exciting — and might mean we have to re-write the textbooks!"

"While this new layer is difficult to observe, its distinct properties may point to an unknown, dramatic event in the Earth's history," she added.

"We found evidence that may indicate a change in the structure of iron, which suggests perhaps two separate cooling events in Earth's history."

"The details of this big event are still a bit of a mystery, but we've added another piece of the puzzle when it comes to our knowledge of the Earth's inner core."

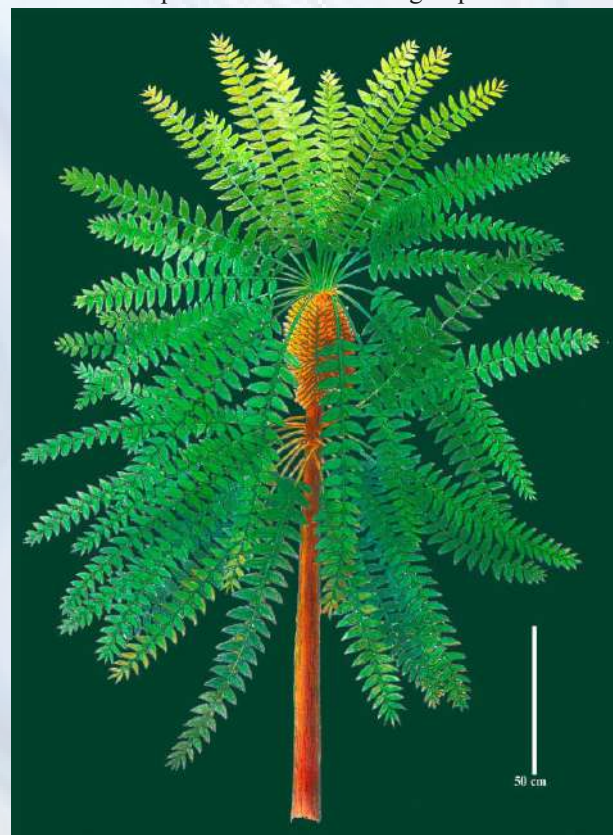
The findings were published in December 2020 in the *Journal of Geophysical Research: Solid Earth*.

Courtesy: Sci-news

- **Permian Tree Fossil Sheds Light on Ancient Evolutionary Race**

Mar 10, 2021 by News Staff / Source

Noeggerathiales are enigmatic plants that existed during Carboniferous and Permian times, 323 to 252 million years ago. Although their diversity and distribution are well known, their place on the plant family tree remained enigmatic because their anatomy was unknown. In new research, paleobiologists in China discovered and reconstructed a new species of noeggerathialean tree that existed 298 million years ago during the Permian period; their analysis shows that Noeggerathiales are more closely related to seed plants than to other fern groups



Reconstruction of the aerial parts of Paratingia wuhaia from the early Permian of China. Image credit: Yugao Ren / Sijia Tang

Reconstruction of the aerial parts of *Paratingia wuhaia* from the early Permian of China. Image credit: Yugao Ren/Sijia Tang.

“Noeggerathiales were recognized as early as the 1930s, but scientists have treated them as a ‘taxonomic football,’ endlessly kicked around without anyone identifying their place in the Story of Life,” said Dr. Jason Hilton, a paleobiologist at the Institute of Forest Research at the University of Birmingham.

“The spectacular fossil plants found in China are becoming renowned as the plant equivalent of Pompeii.”

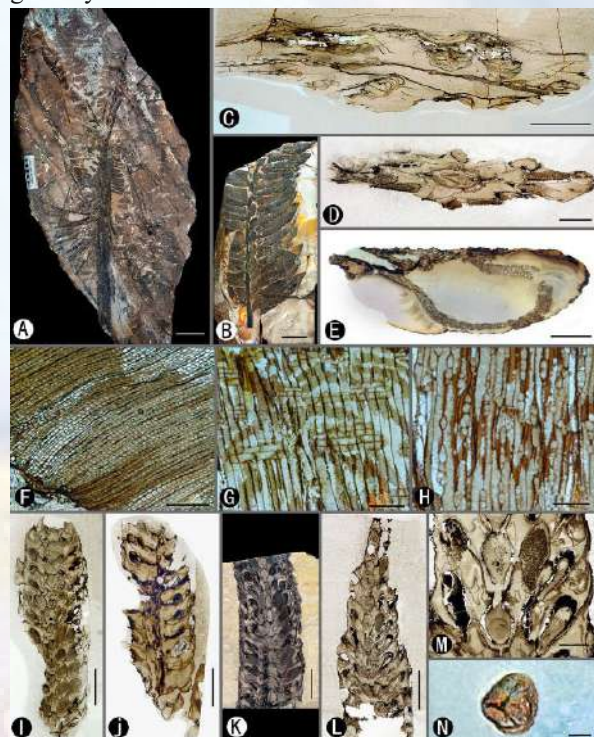
“Thanks to this slice of life preserved in volcanic ash, we were able to reconstruct a new species of Noeggerathiales that finally settles the group’s affinity and evolutionary importance.”

“The fate of the Noeggerathiales is a stark reminder of what can happen when even very advanced life forms are faced with rapid environmental change.”

Dr. Hilton and colleagues uncovered the fossilized remains of a new noeggerathialean species — named *Paratingia wuhaia* — within a 66-cm-thick volcanic ash-fall horizon previously termed the ‘Chinese vegetational Pompeii’ at Wuda open coalmine, Inner Mongolia, China.

They found that Noeggerathiales are in fact advanced tree-ferns that evolved complex cone-like structures from modified leaves.

Despite their sophistication, they fell victim to the profound environmental and climate changes of 251 million years ago that destroyed swamp ecosystems globally.



Paratingia wuhaia: (A) holotype with an entire crown consisting of pseudostrobili and leaves; (B) once-pinnate compound leaf with both large and small pinnules visible; (C) cross-section of a crown illustrating pseudostrobili around the stem; (D) cross-section of pseudostrobilus with microsporangia around the axis with bilateral, inverted Ω -shaped vascular bundle; (E) cross-section of a leaf rachis showing the same form of vascular bundle as that of pseudostrobili axes; (F-H) partial cross, radial, and tangential sections of the stem showing the secondary xylem (wood); (I) tangential section of pseudostrobilus showing sporangial arrangement with single line of megasporangia along with the axis; (J) radial section of pseudostrobilus showing adaxial sporangia and axis lacking nodes; (K) tangential section showing adaxial sporangia and a single line of megasporangia along with the axis; (L) tangential section through same specimen as K showing megasporangial arrangement; (M) detail of the middle part of L showing the megasporangia and microsporangia; (N) single spore macerated from the holotype. Scale bars – 10 cm (A), 3 cm (B), 1 cm (C-E), 100 μ m (F), 200 μ m (G and H), 5 mm (I-L), 2 mm (M), 10 μ m (N). Image credit: Wang et al., doi: 10.1073/pnas.2013442118.

“Many specimens were identified in excavations in 2006–2007 when a few leaves were visible on the surface of the ash,” said Professor Jun Wang, a paleobiologist at the Nanjing Institute of Geology and Palaeontology, “It looked they might be connected to each other and a stem below — we revealed the crown on site, but then extracted the specimens complete to take them back to the lab.”

“It has taken many years to study these fully and the additional specimens we have found more recently.”

“The complete trees are the most impressive fossil plants I have seen and because of our careful work they are also some of the most important to science.”

Courtesy: Sci-news

• Organic matter discovered on an asteroid for the first time

Researchers have for the first time found water and organic matter on the surface of an asteroid sample returned from the inner solar system. This marks the first time that organic materials — which could have provided chemical precursors for the origin of life on Earth — have been found on an asteroid. During the Japanese space agency JAXA's first Hayabusa mission in 2010, a single grain of sample was returned to Earth from asteroid Itokawa. The sample shows that water and organic matter that originate from the asteroid itself have evolved chemically through time.

The research team suggests that Itokawa has been constantly evolving over billions of years by incorporating water and organic materials from foreign extra-terrestrial material, just like the Earth. In the past, the asteroid would have gone through extreme heating, dehydration and shattering. However, despite this, the asteroid came back together from the shattered fragments and rehydrated itself with water that was delivered via dust or carbon-rich meteorites. The single grain from the asteroid, nicknamed 'Amazon', has preserved both unheated and processed organic matter within ten microns of distance. The organic matter that has been heated indicates that the asteroid had been heated to over 600 degrees Celsius in the past. The presence of unheated organic matter very close to it, means that primitive organics arrived on the surface of Itokawa after the asteroid had cooled down.

Courtesy: ThePrint

- **Found in the Sahara, a meteorite older than Earth itself**

The rare meteorite, estimated to be 4.6 billion years old, was found by a team led by Jean-Alix Barrat of Université de Bretagne Occidentale. Results of the study have been published in PNAS. Bengaluru: A meteorite that landed in the Sahara Desert last year has been dated as being 4.56 billion years old, which makes the volcanic rock older than Earth, which is approximately 4.54 billion years old. Named Erg Chech 002 (EC 002), after the Algerian site where it was discovered, the rock is a rare artefact from a protoplanet — a large body of matter in orbit around the Sun or another star, and believed to be developing into a planet — that was likely forming when the solar system was a young 2 million years old. The solar system with all its planets was considered to have evolved to its current structure about 4.57 billion years ago, while the Sun formed first, over 4.6 billion years ago. The team behind the findings, led by Jean-Alix Barrat of the Université de Bretagne Occidentale, France, speculates that this astronomical body would have either been destroyed or absorbed by bigger rocky planets as they formed closer to the Sun. The results of the meteorite study were published in the journal PNAS this month. The meteorite was part of a group that was recovered in May 2020 near Bir Ben Takoul, southern Algeria, within the Erg Chech sand sea. The stones are described as having a —coarse grained, tan and beige appearance interspersed with crystals that are green, yellow-green, and yellow-brown. They are igneous in nature, which means they formed from molten rock or magma. A rock like EC 002 is a relic from the very early days of the solar system, and most of the material from the time has since become a part of other bodies that have evolved to form planets or asteroids, from which we have plenty of meteorites today. No known asteroid or meteorite looks like EC 002, indicating how rare the finding is, and how these rocks likely do not exist anymore. About the meteorite The rock that makes up the meteorite is of a type

called andesite, which is made of solidified magma or lava. These are found on Earth in subduction zones, where tectonic plates slide below each other and rock from the crust enters into the mantle of the Earth. Meteorites have rarely been found to be andesites. EC 002 is classified as an achondrite, a type of meteorite that originates from a parent body that had a differentiated crust and core, like the rocky planets. Achondrites lack 'chondrules', which are round bubble-like grains of partially molten droplets that form in space when smaller bits of rock merge together. This piece of rock is believed to have come from partly molten magma in its parent body's crust and is rich in silica, while most magma is rich in iron. It is also categorised as ungrouped, which means that although its characteristics are welldefined, they don't fall into any established groups of meteorites. According to the researchers, their analysis shows that the rock was likely the part of a crust of an ancient protoplanet or early rocky planet that eventually broke up. The magma that EC 002 formed out of would have been at least 1,220°C and taken at least 1,00,000 years to cool and solidify.

Courtesy: ThePrint

NATIONAL

- **It pays to be 'fossil hunters': GSI**



Geological Survey of India. File | Photo Credit: twitter.com /@GeologyIndia

There aren't too many takers of palaeontology in India, but it offers a high-yielding career. Palaeontology is not as adventurous as the Indiana Jones or the Lara Croft franchise makes it seem. But seeking fossils could translate into a high-yielding job in sectors such as oil and gas, scientists at the Geological Survey of India (GSI) say. Palaeontology, a branch within geology, is the study of prehistoric organisms that thrived in the biosphere of the earth and later transformed into fossils after burial. Many of these organisms — the dinosaurs, for instance — are extinct while many others still survive or are extant.

Experts say palaeontology is crucial for revealing the geological history as well as defining the evolutionary patterns of life that survived on earth through the geological ages. While constructing the stratigraphy of a basin, fossil records play the key role in defining the age of the different lithological horizons with the help of its diagnostic fossil assemblages.

Stratigraphy is the order and relative position of strata and their relationship to the geological timescale.

There aren't too many takers for palaeontology in India. But things could change with a growing demand for "fossil hunters" in various sectors, geologists said.

"There are special streams within palaeontology such as micropalaeontology, palynology and ichnology and one needs to develop expertise in such streams. Similarly, careers in palaeontology are diverse and possess a lot of opportunities for amateurs as well as professionals," Arindam Roy, senior geologist in GSI's Palaeontology Division said.

"A significant career prospect in palaeontology after pursuing a Ph.D. is teaching the subject as a professor in academic institutions. But expertise in micropalaeontology can help get jobs in oil companies where the role of palaeontology is to help locate possible oil reserves based on microfossil assemblages," he said.

Apart from the PSUs and private oil firms, there are scientific positions for students with a research background in organisations such as the GSI, Birbal Sahni Institute of Palaeosciences, Wadia Institute of Himalayan Geology, Indian Statistical Institute, National Institute of Oceanography and many institutes under the Ministry of Earth Sciences and the Department of Science and Technology, Mr. Roy said.

There are opportunities in European countries too, he added.

"To pursue a career in palaeontology, it is always better to opt for a particular specialisation and gain expertise on the subject through research and publications. This process of career building may be time-taking, but the efforts will be high-yielding," Mr. Roy said.

He advised students who complete their Master's in geology to check out various fellowship programmes for Ph.D. courses in palaeontology as well as post-doctoral fellowships offered by the Science and Engineering Research Board and the University Grants Commission.

Courtesy- The Hindu

- **India Has Already Witnessed 3 Big Forest Fires in 2021, Odisha's Simlipal National Park Latest to Fall Prey**

A massive forest fire ripped through the Simlipal National the Park in Odisha's Mayurbhanj district on Tuesday. The state government said 95 per cent of the fire points have been extinguished or attended to.



© Provided by News18 India Has Already Witnessed 3 Big Forest Fires in 2021, Odisha's Simlipal National Park Latest to Fall Prey

"The sustained proactive actions of the government and rigorous work by field staff has led to total containment of fire in Simlipal. Today Simlipal had only 26 FSI fire points & doused by field staff," Sandeep Tripathi, the chief of the task force on forest fire Odisha informed on Twitter on March 9.

In what was seen as a big relief, mild rain with thundershower was experienced at the Karanjia forest range, adjacent to the Simlipal National Park. However, a major portion of the national park has been affected by the fire. The question that arises now is, are forest fires new?

No. Forest fires have been frequently reported in the country, the concentration being the hilly terrains of Himalayas and the north eastern states.

Two months ago in January, Kullu in Himachal Pradesh raged for days before being brought under control. Forest fires were also reported in Shimla and other parts of the state. Local reports say that the fire spread to other areas and was stopped before it could spread further.

The forest fire common during the dry season, especially during summer as that is when chir pine forests become easy preys to wildfires.

Earlier in January, forest fire was also reported from the Dzukou Valley on Nagaland-Manipur borders. The fire, which raged for two weeks, first broke out in the Dzukou Valley under Kohima district in southern Nagaland on December 29 and crossed over to the northern Manipur side, forcing both the state governments to request the NDRF and the army for help.

In the last three months, three major forest fires have been reported across the country, affecting huge tracts of forest and raising larger ecological concerns.

Reports from the Forest Survey of India suggest that forest fires are not only an old phenomenon but also that their frequency has increased over the years.

The Forest Survey of India (FSI) detected 2,77,758 forest fire points from 2004-2017 across the country in a 2019 report. Assam (20,862), Chhattisgarh (25,995), Madhya Pradesh (24,422), Maharashtra (20,686), (Mizoram

- Pradesh (24,422), Maharashtra (20,686), (Mizoram 32,659) and Odisha (26,719) had the highest number of fire points, the report stated

The FSI study also showed a gradual increase in these fires since 2004-05 when there were 8,654 forest points which went up to 30,892 in 2009-10 and further surged to 35,888 in 2017.

It further stated that 665 grids are extremely fire prone in the country, making 3.89 percent of the total forest cover. In technical terms a grid is an area measuring 25 square kilometres (5 km x 5km). There are 2,259 grids or 6.01 percent of forest which are highly fire prone. While, another 3,708 grids or 11.50 percent of area are fire prone. Going by the report, forests in the northeastern states — Mizoram, Tripura, Assam and Meghalaya – fall under the list of extremely fire prone class.

The concern against the calamity was also raised in the Parliament last year after which the Union Minister responded that forest fires have been increasing across the globe and over 2.56 lakh hectare land in India was affected by it in 2019.

“As regards India, an area of 2,56,710 ha has been affected by fire in 2019 as reported by the States. Most forest fires in the country are ground fires in which ground vegetation, etc. get burnt. The number of incidents of forest fire in the country varies from year to year depending on various natural and anthropogenic reasons,” Minister of State for Environment Babul Supriyo said in a written response to the Parliament in September last year.

Experts have linked frequent forest fires to climate change and local factors. In case of Odisha, some reports point out to eucalyptus trees, which are prone to fire, as potential triggers. Whereas in Himachal, experts have linked the fires to chir pine forests.

The risk of forest fires remains in the future. A report in Times of India said that forest fire alerts have increased across the country by 125 % this year. Between November 2019 and January 2020, 1,321 alerts were sent out. This year 2,984 alerts are already sent, mostly from Uttarakhand, Odisha and Maharashtra.

Courtesy: News18

- **Coal India approves 32 mining projects worth Rs 47,000 cr this fiscal**

24 are expansion projects, eight are greenfield; combined incremental peak capacity is projected at 193 MTPA

National miner, Coal India limited (CIL), said it has approved 32 new coal mining projects in the ongoing financial year with an estimated cost of Rs 47,000 crore.

Of the 32, twenty-four are expansion of existing projects and the remaining eight are greenfield. The combined incremental peak capacity of these projects is projected at 193 million tonnes per annum (MTPA). This will be in addition to the already sanctioned capacity of 303.5 MTPA, said the company.



The incremental production by FY'24 from the approved 32 expansion and the new greenfield projects would be to the tune of around 81 MTPA.

CIL said this is a record capacity addition in its history. "Such high number, either in terms of projects or capacity addition, has not been cleared in a single financial year so far" said a senior official of the company.

CIL Board and Boards of the respective subsidiary companies have given their nod for the move, CIL said in a statement.

The company said the record capacity addition is in line with its efforts to replace coal imports in the country.

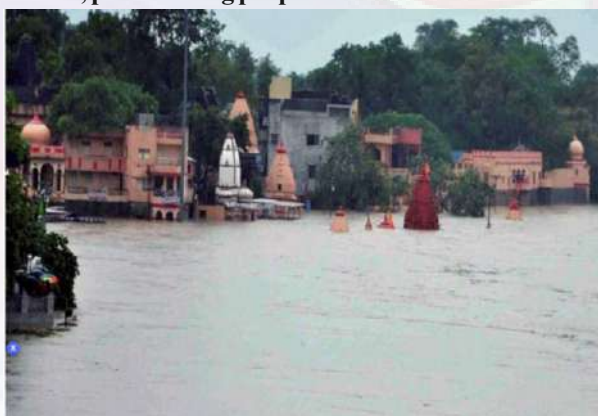
Of the 193 MTPA capacity of 32 projects, the three subsidiaries of CIL, South Eastern Coalfields Limited (SECL), Central Coalfields Limited (CCL) and Mahanadi Coalfields Limited (MCL) at 167 MTPA between them form the bulk at 86.5 per cent.

SECL with 6 projects at an estimated incremental investment of Rs 18,657 crore accounts for 63.5 MTPA followed by CCL at an investment of Rs 7,520 crore for 10 projects of 56.6 MTPA. MCL with 3 project would add up to 47 MTPA at an investment of Rs 14,057 crore. Balance 26 MTPA would be met through ECL, NCL and WCL with the remaining investment between them.

“Concurrently, in tandem with production the company is also strengthening the rail evacuation infrastructure through setting up rail lines, sidings and first mile connectivity projects in the companies from where the majority of the output is expected” CIL said.

Courtesy: Business Standard

- **Geological explosion on Triveni Ghat of Shipra river, panic among people**



Indore: A geological explosion has been seen on the Triveni Ghat of Shipra river in Ujjain for the past few days. The villagers living nearby have heard its voice. Fire and smoke have appeared from where the explosions are taking place. After getting the information of the case, the administration has come into action. Soon a team of geologists and the Geological Survey of India will come here for investigation. Collector Ashish Singh said that it is too early to say anything. After investigation, we can find out why were explosions inside the river. After this incident, moving around the ghat has been banned. For the sake of security, employees' duty has been scheduled.

For the past few days, the sound of a blast has been heard from inside the river at the stop dam near the Triveni Ghat on the Shipra River. Along with this, there is also information about smoke and fire. According to the villagers, when the first such sound came, it was a normal phenomenon, but later this movement has started growing even more. There is panic among the villagers due to the explosion of fire and the water bouncing up to several feet. On receiving the information, Collector Ashish Singh reached the spot with the officials on Saturday and released the information.

He has put the duty of an employee there for security. The collector said that there is no reason to say why the blasts are happening. The team of Geological Survey of India has been called for action. A sample has been sent to the laboratory.

Petroleum or gas storage may be the reason: It has been learned that geologists say that such incidents are caused by the petroleum and gas reserves inside the ground. When this gas comes out, there is a bang and a fire is seen. The geopolitical stir also cannot be ruled out.

Courtesy: Newstrack

JHARKHAND

- **Scientists begin Jharkhand digging to go deep into Aus-India split**

NEW DELHI: Scientists in India have begun contemporary excavation and preservation of petrified wooden fossils at Mandro Park in Jharkhand, 70 years after it was dug up whereas saying contemporary efforts are required to set up how Australia Antarctica had split from India and non-flowering crops led to start of flowering crops (angiosperms) throughout the early Cretaceous interval.

The examine is being led by Birbal Sahni Institute of Paleosciences (BSIP) and forest officers of Jharkhand. The space beneath excavation contains Damin-i-Koh within the Rajmahal Hills of Mandro Park and primarily Sahibganj, Pakur, Dhumka and Godda districts of Jharkhand.

There are three parts to this big research. We will collect sediments from section from where we procure the fossil. The sediments are then used for determining the biostratigraphic framework which in turn helps us to determine the age of the fossil” stated scientist Dr Vivesh Vir Kapur, BSIP, who’s main the analysis. There are three parts to this big research. We will collect sediments from section from where we procure the fossil. The sediments are then used for determining the biostratigraphic framework which in turn helps us to determine the age of the fossil” stated scientist Dr Vivesh Vir Kapur, BSIP, who’s main the analysis. “Then we try to recover pollens, known as palynomorphs, from the rock samples and also from where wood fossils have been recovered. The process is used to separate palynoflora and microfauna,” stated second scientist Dr Suresh Pillai.



“Petrified woods are a type of wooden the place the minerals change the construction of the organism.



More than 4 dozen contemporary fossils have been dug up already between March 9 and 13 this week.

There had been a big specimens that lay buried about 1m into the bottom which demand in-situ conservation and cautious extraction close to , stated scientists.

So, when a prehistoric plant is discovered on each, as an illustration, Australia, and India, it will assist perceive the split higher. “The flora during the Cretaceous period was largely conifers and non-flowering plants. Flora from Antarctica and Australia are similar to that from India. Research will help us narrow down the time frame when they separated from India. Right now, it is believed to have happened 140 million years ago,” stated Dr Vandana Prasad, director of the institute.

The Cretaceous interval (145 to 65 million years in the past) is believed to have had heat local weather and excessive sea ranges. The first flowering crops on the planet started to emerge within the Early Cretaceous interval, 125 million years in the past.

“They began to diversify during Late Cretaceous period (by 65 million years ago). This rapid expansion of angiosperms (flowering plants) corresponds to an important phase in the breakup of Gondwana (the supercontinent from which India, Sri Lanka, Australia, South America, Africa, Arabia, Madagascar and Antarctica broke off) and a series of major sea-level fluctuations,” stated a senior archaeologist engaged on the challenge.

Prasad added, “It was the founder of our institute, Birbal Sahni, who had between 1946 and 1948 first discovered numerous specimens of petrified wood (in which minerals replace the structure over time). Ever since then, it has been the site of discovery of many Cretaceous fossils.”

Courtesy: India News

Beauty of Horhap forest in Ranchi

- Dr. Nitish Priyadarshi



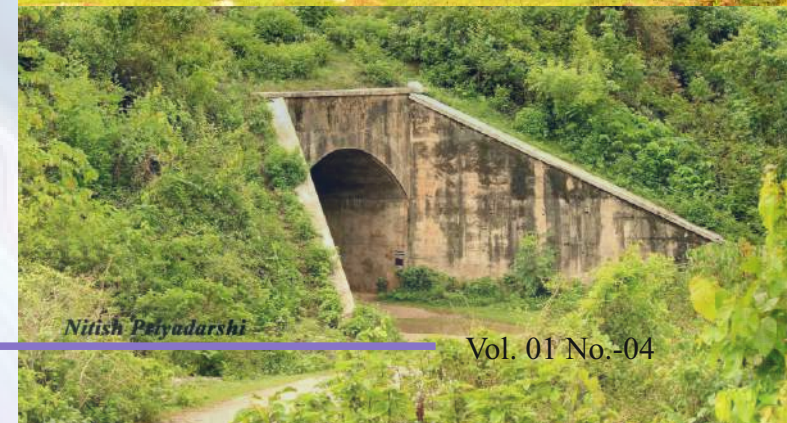
Nitish Priyadarshi



Nitish Priyadarshi



Nitish Priyadarshi



Nitish Priyadarshi

RETIRED TEACHERS OF THE DEPARTMENT (Cont'd)

<p>Name: Dr. Umesh Chandra Date of Birth: March,1928 Qualification: Ph.D. Date of Joining: 1951 Date of Retirement: March,1990 Post Held: Professor & HOD Research Contribution/Supervision: 01 Mailing Address: Off Bariyatu Road, Morabadi Mobile Number:9431175727</p>	<p>Name: Late Dr. M.M. Aru Date of Birth:07.01.1938 Qualification: Ph.D. Date of Ph.D. Degree Awarded: Nov. 1979 Date of Joining: 18.04.1965 Date of Death: 08.10.1990 Post Held: Reader Research Contribution/ Supervision: 01 (One) Mailing Address: Samlong, Lower Chutia Mobile Number: 8789897850(Son)</p>
<p>Name: Dr. Guneshwar Jha Date of Birth: June,1942 Qualification: Ph.D. Date /Year of Ph.D. Degree Awarded: 1975 Date of Joining:17.02.1964 Date of Retirement 30.06.2002 Post Held:Professor, HOD & Dean (Science) Research Contribution/ Supervision : 09(Nine) Mailing Address:Near Divyayan Talab,Morabadi Mobile Number:9430115978</p>	<p>Name: Dr. M.P. Sharma Date of Birth:31.01.1946 Qualification:Ph.D Date of Ph.D. Degree Awarded: 16.04.1984 Date of Joining:01.03.1967 Date of Retirement/Death : 31.01.2008 Post Held: Associate professor Research Contribution/ Supervision:02 Mailing Address: Ratu Road, Ranchi Mobile Number:9431902814</p>
<p>Name: Late Dr. J. C. Pathak Date of Birth: 09.09.1937 Qualification: Ph.D. Date of Ph.D. Degree Awarded: Sept. 1973 Date of Joining : 1964 Date of Retirement:30.09.1997 Post Held: Professor & Dean (Science) Research Contribution/ Supervision: 03 Mailing Address: Circular Road, Lalpur, Ranchi</p>	<p>Name: Late Dr. Vishwanath Jha Date of Birth: 02.09.1952 Qualification: Ph.D. Year of Ph.D. Degree Awarded:1986 Date of Joining: 07.01.1982 Date of Death: 06.04.2015 Post Held: Associate Professor & HOD Geology, RU Research Contribution/Supervision: 01 Mailing Address: shipraraj1484@gmail.com (Daughter) Mobile Number: 8969821329 (Daughter)</p>
<p>Name: Dr. S. P. Singh Date of Birth: 21.09.1943 Qualification: Ph.D. Year of Ph.D. Degree Awarded:1981 Date of Joining:17.08.1965. Date of Retirement: 30.09.2003 Post Held: Professor, HOD & Dean Science, R.U, Ex V.C. VKU Arrah & V.C.Himalayan Univ. Itanagar A.P. Research Contribution/ Supervision : 05 Mailing Address: C-101, Harmu Housing Colony, Ranchi Mobile Number:9431129595</p>	<p>Name: Dr. Uday Kumar Date of Birth: 01.07.1954 Qualification: Ph.D. Year of Ph.D. Degree Awarded: 1995 Date of Joining:20.11.1978. Date of Retirement: 30.06.2019 Post Held: HOD Research Contribution/ Supervision : 07 Mailing Address:1A, Archana Residency,, Bariatu, Ranchi Mobile Number:9431325230</p>