DIAMOND JUBILEE YEAR 2022

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CONTRIBUTIONS OF RU ALUMNI IN GEOLOGICAL RESOURCES EXPLORATION IN INDIA

Our nation is celebrating the 75th year of Indpendence 'Azadi ka Amrit Mahotsav' with the main objective of making a self reliant nation--'Atmnirbhar Bharat'. The University Department of Geology is also celebrating its Diamond Jubilee completing the sixty eventful years since its inception , and playing a significant role in capacity building of national economy. In the endeavour of self reliant economic growth of nation through industrialisation and agrarian revolution , the technically sound human resources developed by the University Department of Geology of Ranchi University has played a commendable role.The impetus on industrial sector in second five year plan transformed the economic sector of our nation which was earlier dependent mainly on agriculture sector. The post independence growth of mineral exploration including fossil fuel has proved to be the backbone of energy and manufacturing industries as well as in transport sector. The massive exploration of metal and fossil fuel provided a self reliant platform for the economic growth of our nation. The alumni of Ranchi University's University Department of Geology, since the inception in 1962, rendered their services in the mission of self reliant economic growth of the nation.The prime organisation of mineral exploration , the Geological Survey of India is being served by a host of Department Alumni, which dates back to Sri Shailendra Nath Sahay (Gold Medalist of 1969)and K.K.P Singh jee to recent entrants like Miss Moni Oraon. Sri Biras Tirkey (Ex Director) surveyed the inaccessible Kargil and Dras sector of Kashmir Himalaya and his report is still serving as the base data for geological evolution of Himalaya in that terrain. His contributions in Air Borne Mineral Survey of Jharkhand and adjoining area is noteworthy. Sri Sona Ram Kisku rose to the post of Additional Director General and justifying his first name 'SONA' he was pioneer in exploring the largest Gold deposits of Jharkhand in Parasi ,Kunderkocha and adjoining areas. He went to Australia to share his expertise in Gold exploration at the invitation of Australian Mineral Foundation . The Deputy Director General list of GSI includes eminent geoscientists like Sri Rajendra Dubey ,(L)Braj Bhushan Prasad, R.K.Sinha, (L) R.K.Prasad, Radha Nand Singh,Assisan Barla, (L)K.B.Khalko. Sri Radhan Nand Singh was the first alumnus to be honoured with the prestigious National Mineral Award. The list of Directors includes Sri Mukund Shrivastav(Gold Medalist of 1975 batch), Debashish Roy, Dipankar Mukherjee, U.P.Singh, Arun K. Sharma, Dr.Mansoor Ahmad, Dr.Arvind Kumar, Dr(Mrs)Debashree P.Singh, Amar B. Ekka, Prabhakar Lakra(Gold Medalist of 2003 batch),Pankaj Kumar, Vijay Bhagat,. Dr(Mrs)Debashree P.Singh is the first Department alumni female geoscientist to hold this coveted post. Sri Prabhakar Lakra, an eminent palaeontologist was sent by GSI to USA for advanced training and research on vertebrate fossils. Sri Ashish K. Jha(Gold Medalist of 2010),Abha U.A.Tirkey,Alok P. Baraiud, Amit Kumar, Mrs. Anjana R. Ekka, Mrs.Arushi Roy, Miss Bindiya V. Ekka, Mrs Anita Gorai, Chaya Minz, Gladson Bage, Mahesh K. Toppo, Nandu Khalkho, Neelam K.Dang, Miss Paushali Chatterjee(Gold Medalist of 2008),Rajesh Gupta, Miss Shreya Shrey, Shambhu Singh, Subodh M. Kujur are serving as Senior Geologist . The young geoscientist ,as Geologists, are Aashish Dundung, Mrs.Aakanksha Tirkey , Anisha P. Khalkho, Mrs. Anugrahit Lakra, Mrs. Ashishit Lakra,Bardan Topno, Deepak K. Tuti, Fredrick R.Kispotta, Marshal Bodra, Moni Oraon, Neha Kumari, Yogendra Bhogta, Mrs Rashmi Ranjan, Neha Dadel, Vikash Anand and many more are actively engaged in different GSI missions.

Another important sector is Fossil Fuel sector in which Coal India, ONGC,NLC and GAIL has contributed a lot to economic growth of nation. In the coal exploration sector since the formation of N.C.D.C to Coal India geoscientists of Ranchi University served as the backbone of exploration. Sri Nimai Rudra was the first geologist to serve in NCDC(later renamed as CCL) who was an eminent footballer of Ranchi also.Department alumni who rose to the rank of General Manager in Coal India are Sri Abjik Mukherjee , Gopal jee Sahay, Shepujan Singh (Gold Medalist of 1972), (L)K.P.Singh(Gold Medalist of 1974), MehmoodAlam, Dr.TapanK.Charavarty, PrabhuPrasad, PrabhatShankar, Dr.V.N.Choudhary, Anand V. Sahay, Kamal N.Prasad, A.K.Gorai, Subash Surin, Kaushalendra C.Jain, UmeshTripathi, Arjun Hembrom and Bharat K. Gajresen. An eminent geoscientist working on Coal Bed Methanen Sri A.V Sahay has authored a book on Coal Bed Methane in Hindi for which he was awarded Rashtrabhash Puraskar from late President Pranab Mukherjee.He also represented India in SAARC convention of Fossil Fuel. In the field of Coal Petrography, Miss J.Moitra , Mrs Zeba Imam and Pravin Sharan are accredited Coal Petrographers of International Committee for Coal and Organic Petrology(ICCP). Miss J. Moitra was the first female geologist of Coal India, and was also member of Bureau of Indian Standards on Coal Petrography. Presently next echelon of geoscientists who served or serving the nation are Sri C.S. Mehra, Madan Gopal Dey, (L) M.P.Singh(Gold Medalist of 1967), (L)Lal H.N.Shahdeo(Gold Medalist of 1973), (L)Manoj K. Mehta,(L)Deepak Prasad,Amar Jyoti Verma, Atanu Gupta, K.K.Bariar, Arunav Saha ,Pravir K. Chakravarty, Rajesh Jaiswal, Shantanu Banerjee, Ruchi S.Gandhi, Moti Lal Oraon, Mrs.Jyoti Dahanga, Dr.R.P.Singh, Mrs.Elizabeth Kongari, Chandra Bhushan, Ritesh Ekka, Anim Lakra to name a few.

In ONGC , the Alumni of the Department have put an indeliable mark of efficiency and excellence. Sri Sanjiv Nath, a Group General Manager, headed the ONGC VIDESH at Cuba. CGMs Sri Mrigendra Sinha and Sri Debashish Chakravarty(Gold Medalist of 1980) were instrumental in formulating and executing the New Exploration Licensing Policy(NELP) scheme for private participation in petroleum exploration. CGMs and GMs like Devendra Singh , Binod Jha, Himanshu K Singh Dr.A.C.Julka, Chandan K Choudhary and Rabi Ghosh provided fillip to the petroleum exploration. Mrs. Prabha Tirkey and Sri Shashi Marandi are involved in CBM exploration in Bokaro basin whereas Mrs. Pallavi Chatterjee Adhikari and Mrs Miden Toppo are providing their technical expertise in Cauvery ,Krishna-Godavari and Cambay petroleum basins. Sri P.K.Mitra has served as CGM in GAIL. Another exploration agency MECL , is providing geological exploration services as a support organisation to GSI and Coal India. Our alumni Sri Shailendra Nath Sahay and Manindra Nath Sahay (Gold Medalist of 1981 batch)served as GM in MECL .SriS.N.Sahay,after providing his expertise in GSI and MEL later extended his services for lignite exploration at Neyvelli, the largest lignite deposit of India. Dr.Tarun Kumar, Sri Bhim Roy, Mrs.Neelu P Tirkey, Atul Kumar and Gaurav Shukla provided their services in different capacity in MECL. In the Central Ground Water Board, Sri A.K.Agrawal is presently Member of the Board while Sri T.B.N.Singh is Regional Director of Bihar-Jharkhand. Sri S.N.Sinha and Sri B.K.Oraon provided leadership in groundwater management as OIC of Jharkhand and Himachal Pradesh. Sri Sunil Toppo, S.S.Purty,Mrs Rose Anita Kujur, Dr.Anukaran Kujur, Sri Atul Beck and Miss Divya Kujur are involved in exploration and management of groundwater in Jharkhand and other states of India.In the mineral management organisation Indian Bureau of Mines Sri P.Tiru, Sri Raja Singh, Sri Nilangshu Chatterjee , Naman Ekka and Sri Binod K Singh has shown their excellence in mineral conservation , mineral and environmental management of minerals and their mining areas.The Department of Mines and Geology-Goernment of Jharkhand is actively engaged in exploration and management of major and minor minerals of our state. Deputy and Assistant Directors Sri R.P.Mishra, Sharad K Sinha, Santosh Singh, Hemendra N Kundu, Pravir Kumar, Amitabh Kumar, Dr.Om Prakash Singh, Mrs. Jaya Kerketta, Mrs Anima Xess, Mrs Rina Orea, Rajendra Oraon, Roshan Panna along with their team of young geologists Keshav Pathak(Gold Medalist of 1999), Dr(Miss)Anubha Tigga, Ambar Kachhap, Aashish Kachhap, Kuldeep Kandulna, Mrs.Anubha Shipa Ekka(Gold Medalist of 2014), Rishabh Prabhat and Abinesh Singh are involved in economic growth of Jharkhand by mineral exploration and mineral management . The strategic mineral sector of Atomic Mineral Division has also witnessed the excellence of our alumni like Dr. K.K.Pandey, Sri Virag Sharan, Sri Raj N.Ekka, Dr.Sanjay Pandey , Sri Bikash Paul and Sri Sidhharth Sarkar(Gold Medalist of 2020.

The above mentioned data of the Alumni have been prepared with the help of Prof. (Dr.) Uday Kumar, Head(Retd.)University Department of Geology, Ranchi University. Besides these government organisations, a large number of geoscientists are engaged in the endeavour economic development of our nation by making it self reliant in the field of minerals and energy sector. In the Amrit Mahotsav of India, students of University Dept. of Geology, Ranchi University have contributed to the best of their efforts in capacity building of Nation.

Prof. Deepak Kr Bhattacharya
(01.10.2005-04.01.2008)
(01.02.2008-13.10.2009)
(30.10.2013-06.11.2015)

Prof. Uday Kumar
(14.10.2009-20.10.2011)
(01.09.2017-30.06.2019)

LIST OF HEADS OF THE DEPARTMENT OF GEOLOGY WHO NURTURED IT SINCE ITS INCEPTION:

(L) Dr. Raghuji Verma
(01.06.1962-17.02.1964)
Founder of Department

Dr. Alakh Narayan Prasad
(18.02.1964-31.12.1964)

(L)Dr.Vishwabath Jha
(21.10.2011-29.10.2013)

Dr. Prakash Kumar Verma
(07.11.2015-31.07.2017)

Prof. Umesh Chandra
(01.01.1965-27.02.1982)

Prof.Guneshwar Jha
(27.02.1982-30.06.2002)

Dr.Anand Murari Tiwary
(01.08.2017-31.08.2017)

Prof. Bijay Singh
(01.07.2019-02.06.2022)

Prof. Suresh Prasad Singh
(01.07.2002-30.09.2003)

Prof . Vijay Kumar
(01.10.2003-30.09.2005)
(04.01.2008-31.01.2008)

Dr. Bacha Ram Jha
(03.06.2022 onwards)

-Chief-Editor

NEWS & NOTES

- **Prof. (Dr.) Ajit Kumar Sinha** has joined as new Vice Chancellor of Ranchi University, Ranchi on 21st June 2022. Dr. Kumar was working as Pro-Vice Chancellor in Vinoba Bhave University, Hazaribagh for two years and was also Director of Central Tasar Research & Training Institute (Central Silk Board, Ministry of Textiles- Govt. of India) Ranchi till 31st August, 2018, during the tenure of which the Institute received more than 35 National Research Projects. Dr. Kumar has more than 390 research publications and in addition to 8 patents, has also developed 12 technologies for Tasar Silk Industry. The Govt. Of Jharkhand has also recognized Dr. Kumar as "JHARKHAND RATAN" for entrepreneurship development in Sericulture.
- **Dr. Bacha Ram Jha**, Associate Professor, has been appointed as Head, University Department of Geology, Ranchi University, Ranchi via memo no B/664/22 dated 02/06/22.
- **Prof. (Dr.) Bijay Singh** has been notified as Member, Jharkhand Academic Council. Ranchi for a period of one year via memo no 03/JAC/-03/2020-1287 dated 14-06-2022.
- **Documentary of Prof. (Dr.) Guneshwar Jha,** Ex. HOD Geology, Dean of Science, R.U., has been Published on You Tube. Link ***https://youtu.be/Zswyw32efhU***
- M.Sc Semester I, Batch (2021-23) & M.Sc Semester IV Batch (2020-22) have secured First Class.
- **Mr. Amit Kumar**, Asst. Prof. Univ. Dept. of Geology, R.U. participated in National Seminar entitled " Chattisgarh Basin and its Environs. Geology, Structure, Economic & Strategic Mineral Deposits & Future Prospective" jointly Organised by AMD, RTMNU and GSI on 5-6 th August at Nagpur, India.
- **Mr.Vikram Yadav**, Research Scholar gave Oral Presentation on topic " Lithotype & XRD Characteristics of Coal Seams of Dhori Area, East Bokaro Coal Field, District: Bokaro, Jharkhand, India." and did Geological Field training during *6th National Geo-Research Scholars Meet from June 7 to 10 , 2022 at University of Ladakh,* Leh organised by *Wadia Institute of Himalayan Geology ,DST,* GOI. Geological Field Trips of 2 days on June 8 & 9, 2022 in Leh-Nimo-Chilling-Basgo-Alchi and Leh-Khardoungla sections .

Dr. Ajit Kumar Sinha, Vice-Chancellor, Ranchi University, Ranchi

Prof. (Dr.) Ajit Kumar Sinha being congratulated for becoming Vice-Chancellor of Ranchi University, Ranchi.

Dr. Bacha Ram Jha, becoming the Head, University Department of Geology.

Prof. (Dr.) Guneshwar Jha

Mr. Amit Kumar, Asst. Professsor

Mr. Vikram Yadav during Oral Presentation at University of Ladakh, Leh Campus

GSI One- day Interactive session on GSI's contribution in Nation building on 13-07-2022

- **Dr. Bacha Ram Jha**, Head, University Department of Geology Chaired the Technical session.
- **Mr. Vikram Yadav**, Research Scholar, University Department of Geology Presented a technical Paper on Coal Geology during the event.
- **Ms. Ritika Tudu**, Research Scholar, University Department of Geology presented a technical Paper on Paleontology during the event.
- **Debolina Mukopadhyay,** Student, Semester II (M.Sc, Geology Session -2021-2023) won 1st Prize in "Quiz Competition" and 1st Prize in "Rock Identification"
- **Harshit Prasad** Student, Semester II (M.Sc, Geology Session -2021-2023) won 3rd Prize in Quiz Competition.

Dr. Bacha Ram Jha, felicitated for chairing the session

Mr. Vikram Yadav during his presentation

Ms. Ritika Tudu, during her presentation.

Ms. Debolina Mukhopadhyay receiving prize for Quiz

Participants from Geology Department.

Mr. Harshit Prasad receiving Prize for Quiz.

Participant from the Department during Quiz competition.

NOTABLE ALUMNI OF THE DEPARTMENT (Continue…)

Name- Mr. Keshaw Kumar Pathak
Designation-Geologist in Mines and Geology Department Govt. Of Jharkhand . Posted at District Geological Office Hazaribag.
R.U Batch- 1997-99 (M.Sc. Geology)
Gold medalist

Name- Mr. Abhinesh Kumar Singh
Achievements-Working as Geologist in Department of Mines and Geology, Jharkhand* Presently deputed in JSMDC as Incharge (Headquarter) Minor Mineral
R. U. Batch - 2012-2014 (M.Sc. Geology)
Address-Singh More, Hatia Ranchi

Name- Mr. Atul Ranjan Bhagat
Batch-2010-2012(M.Sc. Geology)
Post-Deputy Collector(Jharkhand Administrative Service)
Current posting- Circle Officer, Raneshwar Dumka.
Email-atul.r.bhagat@gmail.com

Name-Mrs. Prerna Jaiswal
Designation-Technical Assistant Geology, CSIR CIMFR Dhanbad
R.U Batch- 2010-12 (M.Sc. Geology)
Address-Dhanbad, Jharkhand
Email-prernacimfr@gmail.com

Name-Ms. Bidya Bhagat
Batch-2019-2021(M.Sc. Geology) Gold Medalist
Post-Teaching Assistant,
University Department of Geology
Ranchi University
Address Ranchi, Jharkhand

Name-Jagatjyoti Nandy
Batch-2020-2022(M.Sc. Geology)
Achievement- Qualified CSIR-UGC NET JUNE 2021 (Lectureship/Assistant Professor)
Special Paper: Sedimentology

NOTABLE ALUMNI OF THE DEPARTMENT (Continue…)

Mr. Satish Tirkey, Sr. Geologist, GSI, Receiving NGA 2019 at New Delhi on 12.07.2022 from Shri Pralhad Joshi, Minister of Coal, Mines & Parliamentary Affairs.

Name- Satyanarayan Munda
R.U Batch:- 2019-2021
POST :- Project Assistant- 2

Name : Navin Prabhakar Shukla
Msc Geology (Fossil fuel)
R.U Batch: 2019-2021
Project Associate at CSIR- CIMFR Ranchi unit.

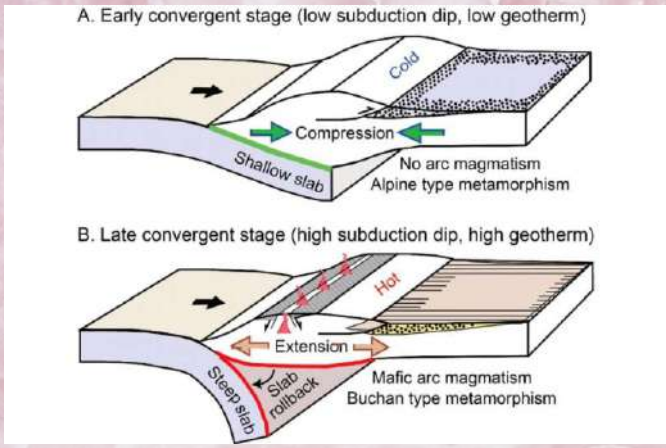
Name- Bhanu Priya Rajlaxmi
R.U Batch - 2019-2021
Post-Project Assistant level 1
Job location - CSIR CIMFR Diwadih, Dhanbad

Name- Dinabandhu Mahato
R.U Batch-2019-22
Post- Project Associate-1

Name : Adarsh Raj Singh
R.U Batch : 2020-2022 (Gold Medalist)
Exam Roll no : 20MS5302396

GLOBAL

Tectonics of convergent plate margins: New insights into continental geology



(a) Low-angle subduction, compressional regime prevails in the overlying plate. Because the plate interface is at low geothermal gradients, the subducting crust experiences ultrahigh pressure eclogite facies metamorphic dehydration at subarc depths, where partial melting of the hydrated small mantle wedge does not immediately happen and thus lack of arc magmatism. (b) High-angle subduction, rollback of the subducting slab results in its decoupling with the mantle wedge at subarc depths, leading to elevation of the geothermal gradient in the subduction zone and switch to extensional regime forming lithospheric rifting in the overlying plate. This would cause not only dehydration melting of the subducting crust but also partial melting of the metasomatites in the small mantle wedge. Credit: Science China Press

A study led by Prof. Yong-Fei Zheng at University of Science and Technology of China focused on the development of tectonic processes along convergent plate margins through inspection of recent advances in the fields of geology, geochemistry, geophysics and geodynamics. These advances are fundamental to our understanding of various phenomena at active and fossil plate margins, providing new insights into many first-order problems regarding geological occurrences in the interior of continents. They have great bearing on the transformation from accretionary and collisional orogens along actively convergent margins to rift failure orogens due to reactivation of fossil suture zones.

Convergent plate margins occur when two adjoining tectonic plates come together to form either a subduction zone, where at least one of the converging plates is oceanic and plunges beneath the other into the mantle, or a collision zone, where two continents or a continent and a magmatic arc collide. Convergent plate margins are arguably the most dynamic plate boundaries on Earth and have been the subject of many investigations and discussions since the advent of plate tectonic theory in the middle 1960s. They show the varied, heterogeneous and complex structure in both space and time due to the multiple geological, physical and chemical processes operating at these zones. Although the largest portion of convergent systems is hidden deep beneath the surface, Zheng and his colleagues have recognized a series of fundamental similarities and differences between active and fossil convergent plate margins.

According to the geometric structure, dynamic regime and thermal state of convergent plate margins, Zheng and his colleagues categorize them into three stages during their formation and evolution. The early stage is characterized by low-angle subduction in a compressional regime at low geothermal gradients, giving rise to Alpine to Barrovian type metamorphism but no mafic arc magmatism. The late stage is associated with high-angle subduction in an extensional regime at high geothermal gradients, giving rise to Barrovian to Buchen type metamorphism and mafic arc magmatism. The post stage is characterized by extensional regimes at high geothermal gradients with neither subduction not collision, giving rise to Buchan type metamorphism and granitic magmatism.

The formation of Alpine type blueschist facies to eclogite facies metamorphic rocks marks the subduction at low geothermal gradients, and the formation of Barrovian type amphibolite to granulite facies metamorphic rocks in the kyanite stability field indicates the collisional thickening at medium geothermal gradients through compressional shortening. Zheng and his colleagues have found two steps during the transformation from subduction zones to rifting zones.The first step is the foundering and thinning of the thickened lithosphere at convergent plate margins,.and the second step is the asthenospheric upwelling to fill the space

of lithospheric thinning and to transfer heat from the deep mantle to the shallow crust. This results in a significant increase in geothermal gradient and causes the thickened crustal rocks to undergo Buchan type anatectic metamorphism under upper amphibolite to granulite facies conditions in the adalusite to sillimanite stability fields.

As generalized by Zheng and his colleagues, material movement at convergent plate margins proceeds in the bottom-up and top-down ways, respectively, corresponding to changes of their thermal state from hot to cold and from cold to hot. In subduction zones, the cold lithosphere sinks into the hot asthenosphere, leading to cooling of the Earth's interior. In rifting zone, both heat and material are transferred rifting from the asthenosphere into the crust, resulting in heat loss from the Earth's interior to exterior. Because subduction and rifting are two key mechanisms for the mass and energy exchange between the Earth's spheres, identifying and distinguishing both tectonic mechanisms and their roles in the formation and evolution of convergent plate margins are the forefront area and major focus of future researches in Earth system science.

The research was published in Science China Earth Sciences.

China's new map of the moon captures lunar geologic features in incredible detail

The 1:2,500,000 scale lunar map released by the Chinese Academy of Sciences. (Image credit: NSSC/CAS

The updated map could be used to aid future landing site selection. Scientists have created a new high-resolution map of the moon using data from China's recent lunar missions.The detailed map was created using data primarily from China's Lunar Exploration Program collected over the past 15 years, and was supplemented by high-quality data from international exploration missions from the U.S., Japan and India.

It reveals geologic layers, structural features and a chronology of the moon's surface, and includes 12,341 impact craters, 81 impact basins, 17 rock types and 14 types of structures.

The map reflects "the evolution of lunar crust under igneous processes, catastrophic impacts and volcanic activities," the research team wrote in a paper accepted for publication in the journal Science Bulletin. The map uses a Mollweide projection that creates an elliptical view of the moon; China also provided stereographic projections, separately centered on the north and south poles. Researchers could use the new work for further lunar geologic mapping and landing site selection for future missions.The full-size map is available from the Chinese Academy of Sciences' National Space Science Center.

Source: Space.com

Exploring the Big Thunder Gold Mine

Pic Credit: Rockngem.com

The Big Thunder Gold Mine in Keystone, South Dakota, is a great place to visit if you want to spend some serious time gold-panning and feel like an 1800's gold miner.

According to the Big Thunder Gold Mine's website, this is a family-friendly venue accessible for people of all ages and abilities, including wheelchairs, with no stairs to access and well-lit areas.

Where the Mine is Located

Keystone is nestled in the scenic Black Hills, a small mountain range in western South Dakota. This region is rich in Native American culture, American frontier expansion history, gold discoveries, conflicts and sorrows, colossal sculptures and gold mines.The name Black Hills is a direct translation of the Lakota name Pahá Sápa. It reflects their dark appearance from far away, as they are covered with evergreen trees.

History of the Big Thunder Gold Mine

The Lakota are one of the indigenous people of the Great Plains, also known as Teton Sioux, who arrived from Minnesota in the 18th century. After fighting the local Indian tribes, the Lakota settled in the Black Hills. In 1868, the U.S Government signed the Fort Laramie Treaty establishing the Great Sioux Reservation, exempting the Black Hills from white settlement, however, gold was discovered in 1874 and everything changed. Thousands of miners poured into the area, and the US Government took back the Black Hills and moved the Lakota people.

In the beginning, placer gold in the Black Hills was retrieved by panning the stream beds using a pan, rocker or sluice box. When most of the easily found placer gold was depleted, miners turned to hard rock underground mining, which is more difficult, demanding and expensive. Several gold mines generated the gold rush in the Black Hills. The Keystone Mine was the first big lode mine in 1891, which was combined with the Holy Terror Mine in 1898 (discovered in 1894). By 1900, the two combined mines were producing a record 5,200 ounces of gold every two weeks, according to Dale Baity in Keystone Gold Mines & Black Hills Mining History.

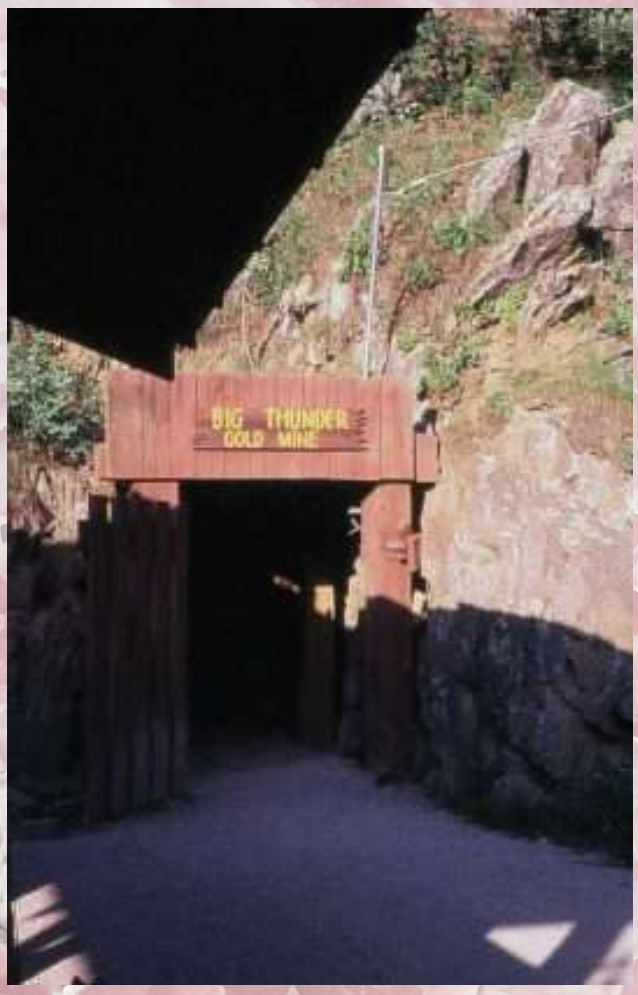
Mine Beginnings

The Big Thunder Mine was originally known as Gold Hill Lode. It was discovered in 1882 and was worked by two German immigrants. The miners drilled the solid rock, trying to reach the adjacent Lucky Boy Mine's rich vein. In 1907, they intersected the Lucky Boy vein after digging an adit (a horizontal tunnel) 330 feet into the mountain. Unfortunately, the vein had tapered to unprofitable status. In 1914, thirty-five years after the miners started digging, the tunnel reached 680 feet into the mountain and 240 feet underground. The mine was worked on and off until the owner, Julius Engle's, death in 1921 and is still waiting for modern mining methods to produce again profitable gold.

The Big Thunder Gold Mine Today

The Big Thunder Gold Mine hosts a mining museum, offers an underground mine tour and gold panning opportunities.The Mining Museum is a replica of the Tykoon Gold Mill. The mill, built in 1895 on the Big Thunder Gold Mine property, processed ore from small area mines. Thousands of artifacts are on display from three old Black Hills mines. Among the exhibits are one of the three original stamp mills, bell crusher, jaw crusher, winch pulley, elevator equipment, original ore carts, blacksmith equipment, mining tool, and an original assay office.

The tour of the original 1890s underground mine - the tunnel inside the hill – explains how miners dug out the gold ore, crushed it at the stamp mill and recovered the gold. The tour lasts about 45 to 50 minutes and includes both the mining museum and the underground mine. The mine tour rate is $11.95 for adults, $8.95 for children 6-12, and free for children five and under.



Source: Rock 7 Gem Magazine

Gold Panning at the Mine

Two options for gold-panning are offered at the Big Thunder Gold Mine. One is on-site gold panning, offered in large troughs outside, with a 15 to 20-minute hands-on lesson of how to pan for gold from the mineral-rich sand and gravel using the proper technique.Gold-panning is available all day. The fee for gold-panning is $11.95 per pan, or $9.95 when combined with the tour.

Source: Rock&Gem

The mine owners place two capfuls of bleach in the troughs to eliminate any viruses and also provide gloves.

The Big Thunder Gold Mine offers a whole day or half-day gold panning at a Black Hills gold claim stream. You will head out with one of their panning experts and pan for gold. You can keep all the finds from your claim-panning adventure. Currently, the rate for adults is $80 for the full day and $50 for a half-day (four hours). A 24-hour reservation is required for claim-panning.

This story about the Big Thunder Gold Mine previously appeared in Rock & Gem magazine.

What causes earthquakes in Afghanistan?

A large earthquake that struck Afghanistan Wednesday has killed hundreds of people. What caused it?

Wednesday's 5.9 magnitude earthquake in eastern Afghanistan has killed at least 920 people, according to officials.

The quake originated near the city of Khost, which is close to the country's border with Pakistan and about 160 kilometers (100 miles) south of the Afghan capital, Kabul.

Earthquakes are not uncommon in the mountainous province of Khost — nearly 50 have been recorded over the past five years, according to the US Geological Survey.

The earthquake originated near Afghanistan's border with Pakistan

Earthquakes are not uncommon in the mountainous province of Khost — nearly 50 have been recorded over the past five years, according to the US Geological Survey.

What caused the quake?

Afghanistan is earthquake-prone because it's located in the mountainous Hindu Kush region, which is part of the Alpide belt — the second most seismically active region in the world after the Pacific Ring of Fire.

The Alpide belt runs about 15,000 kilometers, from the southern part of Eurasia through the Himalayas and into the Atlantic. Along with the Hindu Kush, it includes a number of mountain ranges, such as the Alps, Atlas Mountains and the Caucasus Mountains. Additionally, the Earth's crust is especially lively in

Afghanistan because it is where the Arabian, Indian and Eurasian tectonic plates meet. The Earth's crust is made up of 15 tectonic plates, which create earthquakes when they shift against each other at their borders. The boundary between the Indian and Eurasian plates exists near Afghanistan's border with Pakistan.

Tuesday's earthquake formed when the Indian plate crashed violently with the Eurasian plate. Collisions like this shake and squeeze the ground upwards. Along with causing earthquakes, this movement creates mountains like the Himalayas or the Hindu Kush and Pamir mountain ranges in northeast Afghanistan.

Seismic events of this nature can cause enormous devastation in places such as Afghanistan, where infrastructure is weak and people live in remote mountain villages that are difficult for emergency rescuers to reach.

A 6.4 earthquake struck western Pakistan in the same region in October 2008, killing 166 people.

Source-dw.com (Clare Roth)

NATIONAL

6th National Geo-Research Scholar's meet begins in Leh

LEH : The 6th National Geo-Research Scholar's meet 2022 was inaugurated by Advisor, Umang Narula on June 8 at the University of Ladakh, Leh campus. Nearly 100 research scholars covering 48 pan-India Universities and institutions are participating in this four-day event.

The four-day event is being organised by the University of Ladakh (UoL) in association with the Wadia Institute of Himalaya Geology (WIHG). The theme of NGRSM-2022 is 'Geosciences in Ladakh Himalaya' and the sub-themes of NGRSM-2022 are Fold belts & Cratons of India; Climatic change & Geological processes; Natural Hazard & Mitigation; and Geo-Resources.

This programme is being organised under the Azadi Ka Amrit Mahotsav celebration, to undertake socially-relevant research toward the sustainable development and prosperity of the Himalayan region; community-driven programmes for viable use of bio-resources of the region; encourage interactions and sharing of expertise and knowledge between personnel, scientists, and research fellows; establish a partnership programme between UoL and WIHG that will be accessible to the scientists, students, and their staff, etc.

Advisor Umang Narula who is also the Pro-Chancellor of the University of Ladakh appreciated the UoL for organising this study-cum-exposure tour. He said that Ladakh is a rich and varied geological repository and this region provides an opportunity to investigate and understand various geological, tectonic control, glacial melt, and climate change processes. Such study-cum-exposure tours provide various opportunities for the research students to interact with experts and also help to develop local competencies.

He further said that in Ladakh such research and findings are crucial for policy and decision-making and would also prove to contribute substantially towards framing ways for holistic development of the Ladakh region and facilitating ease of living of the people living here.

Chairman, Wadia Institute of Himalaya Geology, Prof Talat Ahmed spoke at length about the importance of the geological features of Ladakh at the national as well as international platforms and said that this study tour in Ladakh would be conducted in the Mahey-Sumdo and Leh to Alchi sections.

.Vice-Chancellor, UoL, Prof SK Mehta informed about the signing of the Memorandum of Understanding between UoL and WIHG to strengthen earth sciences in the Himalayan region and to establish the University of Ladakh as a center for research in the geosciences.

Director WIHG Prof Kalachand Sain, Director Leh Campus (UoL) Konchok Angmo, and Convener NGRSM 2022 (UoL) Dr. Riyaz MK Khan also spoke on the occasion.

Secretary Tourism & Culture UT Ladakh, Kacho Mehboob Ali Khan; Chairman WIHG, Talat Ahmed; Vice-Chancellor, UoL, Prof SK Mehta, Directors, Professors, scientists, faculty, research scholars, students of UoL and WIHG, and officers of various research institutions of Ladakh were also present and the Abstract Volume was also released by the chief guest and other guests.

Later, the chief guest also visited classrooms, hostel block, and heritage site in the UoL's Leh Campus.

Source:Reach Ladakh Bulletin

Debjani Raychaudhuri, Senior Geologist in GSI's Meteorite & Planetary Science Division

Geologist Debjani Raychaudhuri never allowed the harsh realities of field work to deter her from exploring and mapping the most remote corners of the country.

Pic Credit: Shuchita Jha

Debjani Raychaudhuri (37) survived a hostage-like situation in the forests along the Bihar-Jharkhand border in 2014 after an encounter with Naxals. Though she is a scholar and not a soldier, the incident is typical of the many adventures she has had while Mapping landforms and studying meteorites for the Geological Survey of India (GSI).

A senior geologist in GSI's Meteorite & Planetary Science Division, Raychaudhuri could have opted for a cushy office job after she cracked the UPSC Geologists' exam in 2008 and got a posting in Bharat Petroleum, but she chose to be in the field and got herself transferred to GSI. Along the way, she has broken many stereotypes around women in geology.

Being a woman in STEM, she said it is only in the professional world that she has become conscious of being a "lady geologist".

The job has taken the graduate from Jogamaya Devi College, Kolkata, to the remotest corners of the country. While many women shy from fieldwork because of physical exertion and unfavourable circumstances, Raychaudhuri said if women want, they can move mountains, or even better, map them.

On field

It is true though that during her encounter with Naxals, she feared for her safety and dignity. "My field partner Aditya and I were traversing through one of the jungles near the Bihar-Jharkhand border when we ran into them. There were many of them, armed with guns. As a woman, I was worried about them misbehaving with me. We were made to sit till it was dark," she recalled.

She did not tell her family about the incident until her field visit was over, so they would not get worried. But when she eventually told them, they couldn't help but marvel at her bravery and her ability to deal with such a challenging situation, said Debasree Raychowdhuri, her elder sister, a banker.

Even today, their parents' blood sugar shoots up during field visit seasons, according to Raychaudhuri.

*R*aychaudhuri said the Naxals checked their maps, GPS and compasses, and even their vehicle to see if they were from the administration. "But once they got the assurance that we were not from the government, they left us at the same spot from where they took us. They said: 'Lijiye, madam, jaha se legaye thay vahi chhod kay jaa rahe hain; bahar ja ke badnaam mat keejiyega' (We are dropping you at the same place from where we picked you. Don't defame us once you leave)," she said.

She said they did not face any problems from the Naxals thereafter. "Had they objected, we would not have been able to complete the assignment. They allowed us into the remotest parts of the forest. For the next many days, we knew exactly where we would find them, but we also knew they wouldn't stop us," added Raychaudhuri.

Jumping Across Foxholes

Debjani said she realised that it was a little unusual to be a woman geologist on the field, but she had not been so conscious about her gender at home or in college.

"I studied in an all-girls college and grew up in Kolkata. I had actually never had the feeling that there were fields that were male-dominated or female-dominated," she said

From early on, she was thinking on her feet and taking risks. The GSI officer's classmate from college, Diya Arora, recalled an incident from when they were young. "In our second year of college, I lost a clinometer (an instrument used for measuring angles of a slope) during a field visit to Rajasthan. Debjani and I went looking for it after dark. We got lost and struggled through rough brambles and bushes. We finally saw our campsite across the highway. To get to the other side of the barricaded highway, we jumped into a foxhole and climbed out on the other side. It was risky, but it is a memory for life," said Arora, a petrologist with US-headquartered multinational company Emerson Automation Solution.

Debjani Raychaudhury and her friends on a field trip while in Jogamaya Devi College

Raychaudhuri's father gave that gentle nudge his daughter needed to quit the desk job for fieldwork. Durgadas Raychaudhuri, an 80-year-old retired mechanical engineer, said he asked Debjani to work in GSI because she did not study geology to sit in an AC chamber. "I do not think there is anything that girls cannot do. As she is a sportsperson, runs marathons and is good at handling tough situations, I had complete faith in her: if she is on the field, she will do wonders," he said.

Love For Science

Raychaudhuri's first love continues to be science as she feels every meteorite is unique. At present, she is studying an iron meteorite, which forms the core of an asteroid, retrieved from Jalore in Rajasthan. "Meteorites hold secrets to the universe. Chondrites are the most commonly found meteorites and hold information about the elements of the universe. Carbonaceous meteorites are said to have brought life on earth. They have minerals and hold proof of there being water in space," she said.

Her parents worry, but they stand by her decisions. "When she would go on field visits in college, we used to talk to her twice a day to ensure she had reached camp safely. Even today, our parents worry about her. For them, she will never be a 'senior geologist' ; she will always be their younger daughter," said Debashree.

Raychaudhuri said fieldwork has removed the atypical image she earlier attached with the life of a government officer.

Need For Persistent Education And Inclusion

"You are out of your comfort zone and there is no luxury," she said. She has had a brush with casteism too. "At the places where we take up field assignments, we rent houses for six months and so on. The first question most homeowners ask is: 'Kaun jati ke hai aap' (which caste do you belong to)? This is the case even if you show them a government-issued ID card," she said.

As a lot of the work involves travelling to remote corners of the country, the job is unpredictable. "On the field, you suddenly see yourself walking kilometres after kilometres, across bushy and thorny paths, in semi-jungles and hillocks, paddy fields and shallow streams. Your vehicle gets stuck and you end up pushing it with your teammates. In worse cases, you walk again to look for a tractor that could tow your vehicle," she laughed.

Debjani Raychaudhury with her teammate Aditya Narayan Paliwal on a field visit in Bihar

Being A Woman In The Field

For a woman, the challenges are tougher. As there are no toilets on the field, women researchers have to wait to get back to the camp if they have to relieve themselves. She said it is a major factor that deters women from opting for fieldwork. "You can imagine how difficult things can get when you are working and have no place to relieve yourself. The most common solution is to answer nature's call in nature but it is not convenient for me, and most

women. It is also not healthy to hold it back for 8-10 hours," said Raychaudhuri.

She feels field vehicles should be equipped with portable toilets to ease the life of woman geologists. "Temporary portable toilets could make a big difference. Since every field party is associated with a vehicle, we need a solution like this," she said.

Vehicles used by geologists on field.

Initially, there were many projects that were considered too tough for Raychaudhuri as she is a woman. "These challenges were there, are there and will be there," she said. "But then, you also have some great male colleagues who fight for you and your case, and who trust you with difficult projects. So, it depends upon your past performance and experience. I can safely say hard work pays."

She feels fieldwork keeps many women away from geology. "Geology encompasses different streams. The ones that are field-centric perhaps deter women because it involves hard work, long periods away from home, and hardships on the field. Given a chance, not only women, but also men would prefer a life of comfort. Perhaps, this is why you do not hear many people opting for geology as a profession," she said.Debjani feels the job goes beyond science."If your health and family permit, go for assignments even if they are in rough terrain. You will learn geology, but also how to live more."

Source- Feminisminindia.com

JHARKHAND

Deep Into The Land Of Forests: A Look At Jharkhand's Many Waterfalls

Jharkhand is blessed with nature's bounty, but the highlight remains the waterfalls that are peppered across the state, each better than the other

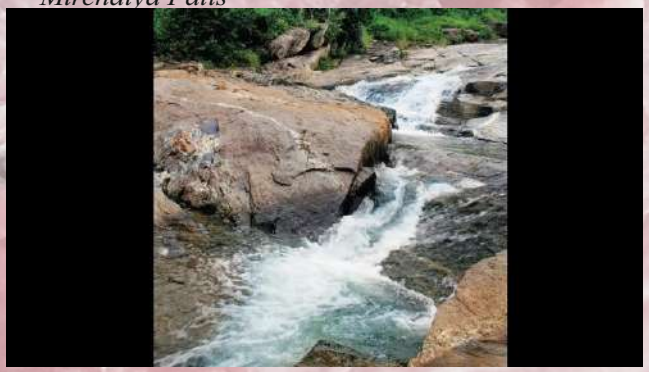
Known as the 'Land of Forests', Jharkhand's lush landscape and serene surroundings can put even the best to shame. And here, it is not just the lush green cover that attracts travellers from all walks of life, but also a number of waterfalls, dams and small streams that make for a perfect getaway for many. Basking in the glory of numerous waterfalls, peppered throughout the state, Jharkhand blissfully enjoys nature's bounty. When you find yourself in the state do no miss out on these waterfalls that are nothing short of a surreal experience.

Hundru Falls

The picturesque Hundru Falls in Jharkhand

Known as the 'Land of Forests', Jharkhand's lush landscape and serene surroundings can put even the best to shame. And here, it is not just the lush green cover that attracts travellers from all walks of life, but also a number of waterfalls, dams and small streams that make for a perfect getaway for many. Basking in the glory of numerous waterfalls, peppered throughout the state, Jharkhand blissfully enjoys nature's bounty. When you find yourself in the state do no miss out on these waterfalls that are nothing short of a surreal experience.

Mirchaiya Falls



Mirchaiya Waterfall

Situated in the Latehar district, 3 kms from the Garu block, Mirchaiya Falls is located within the Betla tiger project reserve area and is formed on the tributary of the north Koel river. One of the safest waterfalls in Jharkhand, it is composed of black granite, which is deposited in the form of a

lava, over which the stream flows. Surrounded by a heavy tree cover, accessibility to this waterfall is easier than one can imagine, with regular public buses plying to and fro. One can also easily find food and lodging options in Garu, making the journey a memorable one.

Moti Jharna

The Moti Jharna has never failed to woo any of its visitors. One of the most scenic spots in the state, it is a delightful sight. Here, the water cascades over a small hill stream and falls over two rocks nearly 50 to 60 feet high. The waterfall is situated near Maharajpur and is famed for its scenic beauty and serves as a picnic spot on hot days. It is believed that a natural stream with its source in the Rajmahal Hills flows quietly that makes the Moti Jharna is a sight to behold.

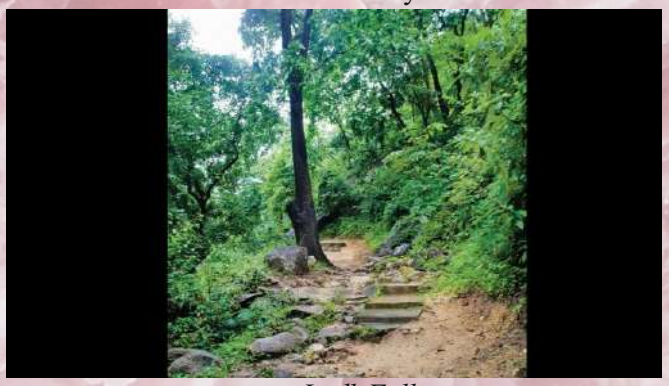
Dassam Falls

Dassam Falls

Nearly 45 kms from Ranchi, a narrow road turns towards the Taimara village and gradually leads travellers towards a wild tributary of the Swarnarekha river—Kanchi. It is believed that the original name of the waterfalls was Da-Song, coined by the Britishers, owing to the sound of the music created as the majestic falls cascade from a height of 144 feet. One can reach here via cars or private vehicles. The waterfalls are truly sight to behold from October to January.

Lodh Falls

The Lodh Falls comes with a bit of history attached to it. Once a popular destination for Britishers to relax, travellers can witness the remains of the Laat Bangla (the site for unwinding) even today. In the Latehar district nearly 61 kms from Netarhat, lie the Lodh Falls, formed by the waters of the Burha river, falling from a spectacular height of 468 feet, making it the highest waterfall in the state. Various local tales of failed attempts of measuring the depth of the waterfall can also be commonly heard here.



Lodh Falls

Jonha Falls

Jonha Falls

One of the most sought-after waterfalls by the locals are believed to be the Jonha Falls. These majestic falls descend from nearly 56 feet above the ground and are one of the safest too. While here one can soak in the tranquil surroundings, go for a day picnic, or simply drive around the area to feel at peace. Near the Jonha Falls are also the Sita Falls which lie in the vicinity and make for a delightful short detour. The water at Sita Falls trickles down rocky gradients and is a natural sculpture. These foaming waterfalls are also surrounded by a lush green cover, that not only is visual delight but also a nature lover's dream.

Hirni Falls

For those heading to the Hirni Falls, be prepared to be enchanted. Think dreamy clouds, serene mountaintops and best of nature's bounty. These waterfalls have been named so, because as they descend on the mountainside, they resemble the sketch of a wild doe. Not only this but Asia's largest sal forests—the Saranda Forests—also begin around the falls, lending them an alluring vibe.

Panchghagh Falls

One of the most frequented falls by the travellers are the Panchghagh Falls.The river Banai, through a rugged terrain, splits and cascades into five different

streams in Jharkhand. The streams find their way through a cluster of rocks and together form the Panchghagh Falls. While here, one can spot the rocky terrain, massive boulders and butterflies making their way. Apart from the waterfalls itself, the surroundings make for a picture-perfect postcard setting.

Source-Outlook

Mystery: Time zone changes as soon as you reach this valley of Jharkhand, the time is visible from 2022 to 2024 directly

Ranchi. The Taimara Valley of Ranchi-Jamshedpur Road is in discussion these days due to the mysterious incident. The reason for the discussion will surprise you too. In fact, crossing the Taimara Valley on the Ranchi-Jamshedpur road, you move forward one and a half to two years. In this area suddenly the time zone of mobile changes and instead of 2022 you go to 2024. Although this area of Taimara Valley, full of natural beauty, fascinates everyone, but in recent times, the area from Rampur to Taimara Valley remains a topic of discussion these days due to a mysterious incident.

When we went out to investigate this discussion, we also faced this strange situation. Suddenly the time zone of our mobile changed near Jamchua and a date setting message came on WhatsApp. February 4, 2024 was visible in the message, while the timing of mobile had also changed.

Time is increasing by one and a half years

When we talked to the local people about this, they said that this is often seen here. The time of the mobile clock of the people passing through here is changing, not for a while, that is, for a minute or two, but the time is moving forward by one and a half or two years. The date and time are also changing. Taimara Valley, which was already in discussion for its secret, is now in discussion about this secret.

Difficulty in making online attendance

The worst effect of this time zone is being seen in Kasturba Girls Residential School in Jamchua area. Especially because of this, the online attendance of the children and staff of the school is not being made, because the attendance of 2022 appears to be 2024. Whereas WhatsApp is also not able to work in this area. Regarding the matter, the principal of the school, Swarnima Toppo, said that people are upset due to the change of time. Along with attendance, many types of apps also do not work often in this area.

Sometimes the lights of vehicles also turn off,

while Lakshman Nayak, who lives in the temple located in Taimara Valley, says that there is some divine power here, due to which this situation is seen here. Along with the time zone of the mobile, sometimes the lights of the vehicles also turn off. In such a situation, this area remains a matter of discussion for its mystery.

Talking about magnetic radiation,

Environmentalist Nitish Priyadarshi says on this matter that this incident has come to his notice, many people have also messaged him in which such things have been told. Such an incident is happening on the way from Rampur to Taimara Valley. On the matter, he said that the fault in the phone or any problem in the mobile network cannot be the reason for this incident. Although he definitely said that there is some magnetic radiation which is affecting the mobile and research is needed to solve this mystery. At the same time, he also told that the street lights of the area also flicker.

Source : News18

Tso-morari crystalline complex : Exotic limestone blocks in Zildat ophiolitic melange at Eastern Ladakh

Pic Credit : Mohd Azhar

Field work organized for the Students of the Department of Geology, Ranchi University, Ranchi from 3rd August, 2022:-

M.Sc Geology Sem II(Session 2021-23) field work inaugurated by Hon'ble Vice-Chancellor , (Prof. (Dr.) Ajit Kumar Sinha) from Tagore Hill, Ranchi.

Spheroidal weathering in Tagore Hill

Apophysis structure in Granite gneiss at Tagore Hill

Amphibolite enclaves in Granite Geiss at Tagore Hill

Biological Weathering in Granite Gneiss at Tagore Hill

Tourmaline mineral in Pegmatite vein at Joda Pahar.

Students and Teachers at field work.