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NEWSLETTER

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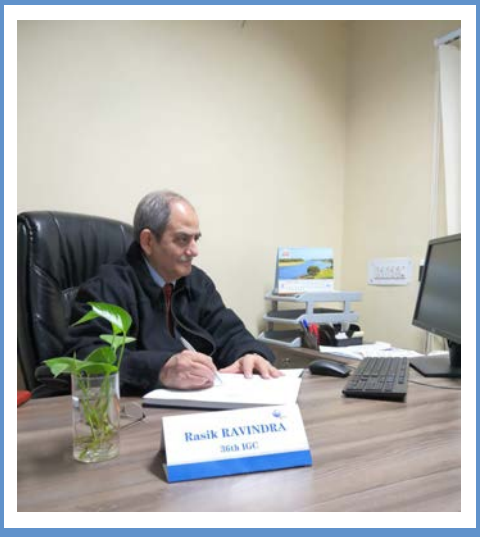

Greetings from the 36th International Geological Congress!

As we tie up all our loose ends for the final leg of this journey, we want to thank you all for your unstinting support and enthusiastic response. The IGC is now all set to welcome you in India with a bouquet of thoughtfully designed programs.

The recent training program of the Volunteers gave a glimpse of the enthusiasm and rumble that the Congress has created around itself. The sight of the young bright faces and the burning aspirations in their eyes have multiplied our joys, renewed our energy and wiped away all our sweat and toil that has gone into bringing the mammoth event to this stage.

It is gives me pleasure to say that in January I had the opportunity to participate in the 74th IUGS-EC meeting in Busan, South Korea and had a great interaction with the esteemed members, enumerating the progress of the 36th IGC.

In this issue, under the spotlight, we bring to you a very interesting story - the Zawar Zinc mine in Rajasthan, a storehouse of countless minerals, metals and building materials, and the world's first zinc smelting site. The mine stands a glorious testimony to the level of scientific advancement that the period, about 2000 years ago, had witnessed, a fact that explains why it had been a focal point of mining and civilization in the country.

In the reminiscences section, we cover the second part of the account by Shri Bikash C Poddar of his experience as a participant in the excursions during the 22nd IGC.

As the clock ticks away bringing us closer to the event, we await with bated breath to see you in the best of your health and spirits!

Dr. Rasik Ravindra
Secretary General, 36th IGC

Indus and Zanskar range, India

Participation of 36th IGC in 74th IUGS-EC Meeting, Busan

A delegation comprising Dr. Rasik Ravindra, Secretary-General, 36th IGC, Prof. DM Banerjee, Representative of Indian National Science Academy, and Mr. Pradeep Singh, Director (Technical) Ministry of Mines represented the 36th International Geological Congress in the 74th meeting of the IUGS EC held at Busan, South Korea on 16th January 2020.

Dr. Ravindra apprised the committee members of IUGS and IGCC about the status of preparedness of the 36th IGC event which is scheduled to be held during 2-8 March 2020. The presentation was followed by an interactive session wherein the queries of the delegates were responded to, to their satisfaction.

The IUGS committee had organized a field trip in the adjoining Geopark for the benefit of the delegates who had attended the meeting. Secretary-General and the other members of the Indian delegation participated in the excursion and gathered important information that will serve as valuable inputs for the city excursions planned for the 36th IGC.

From a Volunteer's Mouth

The 36th IGC is readying a young and vibrant force of 350 volunteers to assist the organization of the Congress. On 30th January, more than 300 volunteers joined the training program with unbounded enthusiasm and a steely will to turn any stone to make the Congress a huge success.

The Training Program aired a strong feeling that the 36th International Geological Congress is round the corner. The bright sunny day began with motivating lectures by our esteemed Prof Dimri, President, 36th IGC, Dr. Ravindra, Secretary-General, 36th IGC, and Dr. Rajeswara Rao, Additional Secretary, Ministry of Mines that set the tone for the rest of the day.

The Conveners elaborated on the Science Program, Field Trips and Geoexpo and the role of the volunteers therein. It was exciting to know how we would be associated with the great minds of the geoscience world during the event. As the day progressed, we were informed of the various other aspects of the Congress as well as the code of conduct for us. It was a great moment for us to listen to Prof. D.M. Banerjee, a stalwart of geology, about his experience as a participant of the 22nd IGC held in India. His love for the subject and words of advice for the youngsters got etched in the minds of all.

At the end, in the interactive session, several queries were voiced by the volunteers that showed that their zeal and excitement had still not ebbed by the day. The queries ranged from issues like safety and security of the visitors and volunteers to handing of tricky situations to the Plenary and Keynote Speakers to the e-posters, the Geoexpo and so on.

We all felt the enormity of the affair that we have been chosen to be a part of. We left with a sense of pride as well as humility, of awe as well as confidence.

36th IGC, here we come!

The first part of this write-up was carried in the previous issue of the newsletter. The second part follows here:

Excursions in Rajasthan centered in Udaipur:

Udaipur was an ideal choice as a venue for excursions on more than one count: (1) the landscape of the City of Lakes was picture-perfect; (2) its historical aura with palaces and Havelis was enchanting and (3) its geology gave eloquent testimony to the myriad events of the Precambrian. Thanks to the magisterial survey of A.M. Heron and his monumental publication (Memoir GSI 79), the workers on cratonic evolution all over the globe were interested in the nuances of the Precambrian of Rajasthan. No wonder so many inquisitive geologists, including leaders and deputy leaders of many countries, opted for these excursions.

When I was informed that I had to play the role of a leader along with my senior C.S. Raja Rao, I was on cloud nine. My first assignment in my professional career was at Udaipur district (Zawar belt) for mapping and exploration of base metals. I landed at the old Udaipur railway station one fine winter morning of January 1960. Since then I was continuously working there in successive field seasons covering base metal belts of Zawar and Dariba-Rajpura-Bethumni. I was conscious that I was roaming on the shoulders of that giant - A.M.Heron. Hence, it was imperative on my part to see a little beyond and add to the corpus so arduously built by him over years of hard fieldwork.

As my work progressed, what impressed me were the unmistakable signatures of well-preserved sedimentary structures across the entire lithological spectrum of the Aravalli supracrustals including the sulphide rhythmites. Heron did not throw much light on the pre-metamorphic history of the sedimentary sequence, regionally deformed and metamorphosed under greenschist facies condition in the Zawar belt and amphibolite facies in Dariba-Rajpura-Bethumni. We did build up a story of the Aravalli Precambrian sequence and its relationship with the Banded Gneissic Complex. With much care, we selected an array of sites where we could demonstrate to the delegates the hard evidence and the logical basis of our paradigm. We could take the delegates successfully to all the selected sites barring Dariba-Rajpura because of logistic constraints.

We arranged the stay of delegates in the imposing Luxmi Vilas hotel overlooking the Pichola Lake. The twilight view of the landscape was surreal. In addition to the geological sites, we arranged visits to historical forts and palaces in Udaipur and Chittorgarh.

The excursions were conducted without any hitch. It was a celebration for us. I never dreamt that I shall have the good fortune of meeting a galaxy of geologists of global fame and show them the ground truth and the logic on the basis of which we could build up the story of the Aravalli Precambrian and make substantive addition to the corpus created by A.M.Heron.

It gives me immense pleasure in recounting some of the comments made by the esteemed scientists. Dr. Sahama, co-author of the famous tome on Geochemistry along with Rankama - called me aside after the dinner and said: "You seem to be enjoying mapping here. You would like it more if you come over to Fennoscandia. The outcrops there are fresh due to glaciation and lack of weathering imprint." After going back home, he sent to me a dozen publications on the Precambrian of Fennoscandia.

Dr. K.C.Dunham, leader of the U.K team, took a photograph of a drill core of perfectly bedded sulphide rhythmite which we discovered in course of our exploration in a virgin area of the Zawar belt. One night after dinner he confided to me: "What you have demonstrated to us about sulphide mineralization in the Zawar belt is something new to me. One of my students will be working here. Will you help him?" "Yes, of course, Sir, with pleasure. It is an honor." I reacted with humility. Dr. Suffel from Canada also took a keen interest in the same sample and photographed it.

There were many jovial moments too. While moving from one site to another in a chartered bus, I used to give a running commentary on the cultural and geological aspects of the terrain we were passing through. As we stopped at a site, the lady delegate from USSR intercepted me: "You speak English fluently but a bit too fast for me." I apologized and promised to decelerate. During site visits, some used to take it very very seriously and others in a light mood. "Look they have started mining... The trouble with these Soviet geologists – they are always so serious," quipped a delegate enjoying his smoke. And there was a young Canadian geologist who was bare-breasted when we were in woolens in cold December morning. He was looking at the rocks but immediately shifted his gaze when a camel passed by with its stately gait. "Wonderful!", he exclaimed.

After a couple of field visits, one delegate asked me: "How are you maintaining the time schedule so meticulously?" I shared the secret: "We have a pilot jeep. My friend sitting there has a stopwatch. He is the timekeeper. We have planned beforehand that if we overshot the time limit in one site, he has to speed up while going to the next site so that we can reach there on schedule as stated in the guidebook. The driver of the bus carrying the delegates was instructed to strictly synchronize with the pilot jeep. That is the trick!"

Now, let me share some anecdotes! I and all the young friends of my team – R.K. Mathur, A. K. Chatterjee and L.N.Dutta got a lot of offers from the esteemed delegates. A. K. Chatterjee utilized the opportunity and went to Canada. Dr. Paulisch from Germany with whom I exchanged in a light mood Guten morgan, Guten tag and aufwiedersehen, sent me the publication "Gesprach mit der Erde", authored by the famous geologist Hans Cloos, along with the papers on Humbold fellowship. Mrs. Barnes, wife of Prof. V. E. Barnes, famed for his contribution on Tektites, took me aside and said: "Look, this Professor, they say, is not that bad. Why don't you come and stay with us and work under him? My son is now living elsewhere". The climax came from Dr. Kautsky, deputy leader of the team from Sweden: "Come to Sweden. The Swedish girls are tall. Surely, I can get a match for you". Dr. Barnes who happened to overhear the conversation wrote to me later on: "How are your plans developing for your study of the Eocambrian of the Scandinavia area. We found the Scandinavians friendly and countryside a delightful place to be. However, we never spent a winter there. "

Dr. Kautsky presented his Compass and hammer to me. I have been using this compass in my fieldwork since 1964. An abiding link with IGC XXII!

Dr. Kautsky's pull was not strong enough to take me out of the orbit of GSI. I had an unfinished task at hand. After completing my field mapping and mineral exploration in Udaipur district (1960-65), I shifted to the Central Petrological Laboratory of GSI at Calcutta to pursue my researches on mineralogy and geochemistry of polymetallic base metal mineralization at Dariba-Rajpura. That is another story!

I wish to keep on record my indebtedness to all my friends – R.K.Mathur, A.K.Chatterjee, and L.N.Dutta. They always stood by me during the excursions. And I pay my homage to my seniors – Mukti Nath, C.S.Raja Rao, and B.Sreekantan. They are no more with us. They had reposed complete confidence in me and gave full freedom at every stage.

Hope we did not fail our learned President of the Republic of India.

It is time to ring out the old and ring in the NEW.

Best Wishes for IGCXXXVI 2020

Bikash C Poddar

Bikash C. Poddar was introduced to Geology in the classroom of Presidency College, Calcutta way back in 1951. Over nearly seven decades, he has remained devoted to this noble science. He walked the variegated ground from the Precambrian in Rajasthan to the Quaternary in Northeast India with passion as a member of GSI, and attempted to add a few lines to the beautiful folklore of Indian geology with humility. His curiosity about the earth we live with abides in the context of emergence of Man as a geological agent in the Anthropocene.

Spotlight: Zawar Zinc Mines

The 1800 million-year-old Aravallis in Rajasthan holds a precious repository of myriad metals, minerals, and building materials notably gold, copper, lead, zinc, silver and iron, ores of which continue to be exploited in Zawar, Rajpura Dariba, Agucha, Khetri, etc.

Zawar however, is of singular interest as it is recognized as the world's first zinc smelting site. Its lead-zinc deposit is located in a rugged and thickly forested area about 40 km south of Udaipur, Rajasthan. This approximately 20 km long mineralized belt has rich zinc-lead deposits hosted in hard, compact, siliceous dolomite.

History of Zawar

Archaeological studies show that this region used metal fairly early in human history. Various ups and downs in the production have been recorded indicating political instability. Despite numerous remains of temples and dwellings found in the Zawar being vandalized, a dozen or so stone slab inscriptions have incredibly survived. These slabs explain beautifully the thriving township and its socio-economic stature.

The mining, smelting, and trading of these resources moved from merchant to merchant as the dynasties changed till it landed in the hands of a public sector undertaking called Hindustan Zinc Limited.

Mining during ancient times

The ancient miners dug downwards with iron club like hammers and chisels, starting from the top of the hill. Opencast mining can be seen for wider ore bodies, while narrow mineralization lodes were followed underground through small openings (gophering), using wooden ladders.

Once the rock was extracted, it was pounded in-situ within a rock depression, the ore hand-sorted and stacked separately for smelting. The ancient smelting process commenced with the roasting of zinc ore. This drove off the sulphur and helped convert the ore to zinc oxide. This was then mixed with reducing agents giving them the end product.

Numerous types of clay retorts were used each for a different metal - zinc, lead, silver. They were single-use and could be discarded with the slag after each use. These, once discarded were also reused as construction material for huts in the Zawar region.

Stok Village, Ladakh, India

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