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1. Introduction

1.1 Meghnad Saha

Born in a poor family of East Bengal (now Bangladesh), Meghnad Saha was a child prodigy. Brought up in the country and in much austerities, he shot into fame in 1920 by his ionization formula propounded from Kolkata. It solved many outstanding problems of the time in stellar spectra and ushered in a new era in Astrophysics. After a brief stint of postdoctorals in England and Germany, delving more in it, Saha was back to the University of Calcutta for a short while before he joined Allahabad University as a professor and head of the Physics Department. Despite many odds of a teaching university, a thriving school of physics built up in Allahabad around him. However, with Sir Jagadis Chandra Bose's demise in 1938 and his nephew Debendra Mohan Bose succeeding to the post of director of the Bose Institute, the Palit Chair in physics of the University of Calcutta fell vacant. Saha filled that Chair. By then he was already an FRS and his field of research had widened much beyond thermal ionisation. Of the many subjects it now embraced one was nuclear physics. From Allahabad he had already written some nuclear physics papers with his student, Daulat Singh Kothari. Historically, these were the first of its kind in India. At least one of them, dealing with magnetic monopole is still considered a classic. Following the discovery of the chargeless neutron, the other subnuclear particle than positively charged proton, - Saha in Allahabad was the earliest to recognise its ability to penetrate an atomic nucleus and bare its mystery. Lores have it he even sought to buy a gram of neutron-radiating radium to verify this, but his labour to raise the necessary fund was frustrated. Very

soon, they showed in the West that neutron could indeed penetrate and transform a nucleus. Meanwhile, trips abroad had exposed Saha to the various advances made in the subject in the West. In a conference in Copenhagen (June, 1936) to which he was invited by Niels Bohr, he made friends with Lise Meitner, Otto Hahn, Wolfgang Pauli, Werner Heisenberg and many other stalwarts of the time. They were all drawn together in this new exciting field. Saha knew this would keep the world busy for some time. Since he next saw Ernest Orlando Lawrence and his cyclotron in the USA, wide possibilities had stirred up in his mind. Here was a machine indispensable for a first hand knowledge of the nucleus. One did not then have a complete idea as to how the nearly massive particles like protons and neutrons made up a very hard and compact atomic nucleus. Shortly after his return to Kolkata, Lise Meitner and Otto Hahn hit the headlines - they had indeed smashed a nucleus, unleashing in the process enormous amount of energy, the latent energy that holds the nucleus together. Saha quickly moved the Calcutta University Senate to include Nuclear Physics as a separate subject in the MSc Physics curriculum. Very soon, he engaged many of his students in various nuclear physics experiments in the Palit Laboratory. In 1938, he had even sent one of his students from Allahabad to Lawrence for a Ph.D. in nuclear physics who was also to acquire the basics of cyclotroneering. By then, Saha's mind was firmly set on constructing a small prototype of a cyclotron in Kolkata. He had spoken about it with Lawrence in the USA and Pundit Jawaharlal Nehru at home. Both had assured him of help. Nehruji, an ardent advocate of meaningful science was an old acquaintance of Saha from his days in Allahabad. The two came even closer while working for the Planning Committee of which Nehru was the Chairman and Saha a member.

Nehruji advised Saha to apply to the Tatas for a fund. Not only did he endorse Saha's application but also saw to it that Saha got the money. But for this support such a costly project could not be initiated, for the University was not solvent enough to finance it. With the money arriving, Basanti Dulal Nagchaudhuri, the said student of Saha now in Berkeley with Lawrence, was immediately instructed to go ahead with the purchase of the essential components of the

machine. It was not an easy task at a time when the War was looming large. Correspondence between Nehruji and Saha from this period reveals how keen was Nehruji's interest in the project. But, as bad luck would have it, the war broke out, seriously impeding the progress of the work. Saha did not, however, despair. He kept Nehruji posted about it on the one hand, and on the other, engaged his students in the Palit Laboratory in the associated work. Sometime in 1948, these activities, growing in volume, would call for a separate establishment. The Institute of Nuclear Physics (INP, founded 1949 and renamed Saha Institute of Nuclear Physics after Saha's death) owes its origin to this. In the beginning it was only an ancillary to the physics department of the University.

1.2 Enter Bhabha

The war fetching ill-luck to Saha, however, had a profoundly different effect on Hormasji Jehangir Bhabha. Born rich in a parsee family sixteen years after Saha, he rounded off his schooling in Mumbai and left for England for higher studies as per family tradition. He earned Cambridge tripos, first in mechanical sciences (1930) and subsequently (1932) in mathematics both with flying colours. Several scholarships helped him visit a number of distinguished laboratories in Europe. Finally it was in Cambridge that he began a research career in physics. This period saw a fruitful collaboration with Heitler (1936) on the origin of the cosmic ray showers, a landmark work, which brought Bhabha much fame. The same year he met Saha, probably for the first time, in Copenhagen during a post-doctoral assignment. Three years later, still in Cambridge, he took a break to visit India.

The War rendered it a stay-back. He joined the Physics Department of the Indian Institute of Science (IIS), Bangalore as a Reader (1940).

The IIS, founded by his relation JN Tata the year Bhabha was born, had in its three-party management representatives of the Tata family. The physics department, however, was relatively new. It was created by Sir Chandrasekhar Venkata Raman soon after he joined the Institute as Director. Sir CV was initially very pleased with Bhabha. Homi tried his hand there in hard cosmic ray experiments with equipped balloons sent high up in the sky. Alongside, he also pursued mathematical

physics jointly with Vikram Sarabhai and Harish Chandra, the latter a brilliant alumnus of Allahabad University. Bhabha won two most important of his academic laurels from here. Thanks to Raman's initiative, nomination (1940) and patronage, Bhabha became a Fellow of the Royal Society in a remarkably short period of time (1941). He also won the prestigious Adams Prize of Cambridge the following year (1942). Indian science saw a rising star in Bhabha. As a member of the IIS Court/Council, Saha had already the opportunity of seeing him closely and had begun to rank him high among theoretical physicists. In December, 1940, the year before Bhabha became an FRS, he invited him to Kolkata on a special readership of the Calcutta University. On that occasion Bhabha delivered a series of 10 lectures on Cosmic rays which were published in Saha's journal *Science and Culture*. Later on, Saha also asked him to join Allahabad University (1941) or the Indian Association for the Cultivation of Science, Kolkata (1942) as a Professor. Bhabha declined both the offers. Apparently, none of these was good enough for him. From then on, Bhabha appears to have kept off Saha's orbit. In 1942, Saha persuaded the Indian Science Congress Association to elect Nehruji President of the 1943 Science Congress though Nehruji was then interned in Ahmadnagar prison. It was a very courageous step at that time. Saha also saw to it that Bhabha was elected President of Physics section of the Congress. But Lucknow, the city to host the Congress was soon thrown into a turmoil in the wake of the 1942 Quit India movement, and the Congress had to be quickly rescheduled elsewhere. Saha shouldered the responsibility of organising it in Kolkata. Bhabha eventually did not come. With Nehru indisposed, the Congress was held with his portrait posted on the President's table and DN Wadia, President of the previous Congress acting on his behalf. That was how the Kolkata scientists stood by Saha to express their appreciation of Nehru's fight for national independence. "It was a very small Congress", lamented a bitter Saha to Nehru much later in a letter[1]. He even observed there that many scientists including those "buzzing around" Nehru and occupying plum posts in free India had held off from Nehru's company at the time of freedom-fight. Raman skipped the Congress on a

different count. He was against any political figure making President of the Science Congress.

The IIS and the Tatas tried their best to make Bhabha comfortable in Bangalore. A brand new cosmic ray laboratory was set up for him. Bhabha, however, was not happy. He did not like cooling his heels over approval of any project and its funding. Besides, with more emphasis then laid on applied than basic sciences, the Institute had practically none doing theoretical physics. Bhabha was always wont to think big. He felt for a place where physics alone would be done on a grand scale. Around 1943, he started negotiating with Sir Dorab Tata[2] the possibility of founding such a school in India. He even hinted at his leaving the country otherwise. From a person no other than his own aunt's husband, it evinced a quick and positive response. Bhabha was asked to submit a proposal to the Trust which he promptly did[3]. The preliminaries completed in no time, the Tata Institute of Fundamental Research (TIFR) was founded on 1 June, 1945 in Bangalore with Bhabha the Director. In his letter to Sir Sorab, Bhabha had also chosen Mumbai as the seat of his institute. Within six months the institute was shifted to Mumbai, retaining only a camp office in Bangalore. One half of the house 'Kenilworth' on Peddar Road in Mumbai was rented for the purpose. The house belonged to Bhabha's other aunt, Mrs Coover Pande. It is a curious coincidence that Bhabha was born in this house in 1909, and thirty six years later the same house saw him reborn as an Institution builder and the Architect-to be of the Indian Atomic Energy Programme. Back to the fold of his own Parsi community and now completely on his own, a very content and comfortable Bhabha pondered his next move. He was to make Mumbai a science city too.

A striking feature in Bhabha's character is self-confidence. Once graduated in mechanical sciences, his father had tried to recall him to one of the Tata enterprises in the country. Homi had successfully stalled that. He said he would rather do a tripos in mathematics, which he did next. And when asked again to come back after that, he convinced his father of the prospects of doing physics even in India. Physics he did at Cambridge. Now he had an institute of his own in

his home town to do more physics. He was so sure of its coming and of his position there that immediately after writing to Saklatvala he wrote to his friend, Subrahmaniyan Chandrasekhar in Cambridge promising him a Chair in the institute[4]. Sir CV's nephew, Chandrasekhar, later to become a celebrity in Astrophysics, knew better and declined the offer very politely. That did not deter Bhabha. Towards the end of 1944, when the-then secretary of the Royal Society of London, Sir AV Hill came to India to secure her scientific collaboration with the West in their war effort, Bhabha had unfolded to him his grand plan about the Institute. In a bid to recruit hand-picked people, he would soon look for people mostly of Indian origin but trained abroad. Apparently, he had seen enough of Indian celebrities in science. "There are however scattered all over India competent workers who are not doing as good work as they would do if brought together in one place under proper direction", he wrote to Sir Sorab. In reality, however, the Institute for some time would not throw its door open to this lot. Bhabha was to start afresh in every sense, and there, he was decided not to compromise.

In the same letter, Bhabha had expressed to Sir Sorab what he wanted to do at the institute. "The subjects on which research and advanced teaching would be done would be theoretical physics, especially on fundamental problems and with special reference to cosmic rays and nuclear physics, and experimental research on cosmic rays." By writing "it is neither possible nor desirable to separate nuclear physics from cosmic rays since the two are closely connected theoretically", he left wide possibilities open. He also hastened to add, "when nuclear energy has been successfully applied for power production in say a couple of decades from now, India will not have to look abroad for its experts but will find them ready at hand". While this statement nowadays is much hyped and held in favour of Bhabha's foresight, one cannot help weighing it against the fact that while witnessing in Cambridge a rapid and exciting growth of nuclear physics Bhabha had not taken any part in it.[5]

From the very start and for a long time to come, TIFR's occupation in the main would remain in the area of cosmic rays and mathematical

physics, the two of Bhabha's fortes and love. He knew, it would be some time before he could take his institute to his desired height. While looking for suitable faculty members for the Institute, he indulged a couple of misadventures apparently in a bid to reorganise Indian science. Prompted by Raman, he, in 1945, tried to dissociate a Royal Society conferral in Delhi from the Science Congress holding there.[6, 7] This, perhaps, was the forerunner of his many moves against the Kolkata-Allahabad axis. By trying to demean the Science Congress, this act, in particular, betrayed to the British eyes a clear divide among the Indian scientists. Later that year, and somewhat on his own, he apparently tried to "unite" the Indian scientists by organising a Central Academy.[8, 9] The country already had by then three existing Academies, namely the National Academy of Sciences, Allahabad (1931), the National Institute of Science (1934, later renamed Indian National Science Academy), Delhi and the Academy of Sciences (1934), Bangalore. In the name of bringing about a unity, it reads more like an attempt to deweed Indian science and introduce a caste system there. While both these attempts miscarried, an opportunity soon came his way to a sure success.

By then the British in India had decided to pull out. Nehruji, whose election to the Presidential Chair of the 1943 Science Congress could not inspire Bhabha to attend the Congress, was now the unanimous leader-to be. It is about this time that Bhabha and Nehruji became quite close. Very soon Bhabha would address Nehru as "bhai" and Indira, Jawaharlal's daughter as "Indu". For him it was easy. In his boyhood days, he had seen Jawaharlal and the prominent national leaders often visiting their family. The Tatas had all along lent a weighty support to the Indian national movement by providing money and helping the country attain self-sufficiency in more than one way. Nehruji had a faint recollection of Homi as a boy from this period. He met him again in 1937 May during a trip in Europe. Besides being an old tie (Jawaharlal too was a cantabrigian) the boy had now turned into a fine physicist. The relation now revived, Homi found in Nehruji a good patron in almost everything.

In the course he had also won Nehruji's heart in favour of nuclear energy in the country. It was already widely felt that electrical power

was indispensable for the post-independence regeneration of India's industry and wealth. But the coal and fossil fuel reserves were fast depleting everywhere in the world. It bears to recall that Saha was the earliest to address the power issue in 1935 in a conference organised by the National Academy of Sciences, Allahabad, an event Nehruji had an occasion to preside over. In the face of the fact that India is blessed with plentiful of sunlight, enough of wind-power, multitude of mighty rivers, and the turbulent seas half-surrounding her, the nuclear option tipped the scale. Bhabha argued, after the Hiroshima-Nagasaki holocausts the West had began to explore atomic power for peacetime use, and India must not stay behind. Defense was possibly another factor, though hybernating for some time. The first excuse alone was sufficient for Bhabha. It would also realise for TIFR the nuclear connection cursorily made in his letter to Sir Sorab.

2. Initiation : The Atomic Energy Research Committee

Bhabha's pursuation with Nehruji had the desired effect. The Atomic Energy Research Committee (ARC) was set up in February 1946 by a decree from the President of the Council of Scientific and Industrial Research (CSIR, registered on 12 March, 1942). It remained under the aegis of the Board of Scientific and Industrial Research, an advisory body of the CSIR. Bhabha was appointed Chairman and Meghnad Saha, Debendra Mohan Bose, DN Wadia, KS Krishnan and a few others members of the Committee; among them, SS Bhatnagar, the foundation Director-General of CSIR was made the member-secretary. The object of the Committee was to plan, finance and carry out Atomic Research and Development throughout India, to explore raw materials connected with generation of atomic energy and to advise Government on the control, utilization and export of such raw materials in India. It was also to take steps in furthering in the country the aim of developing atomic energy research to the fullest, a process in which the Indian universities soon disappeared from a back seat. The Committee's task finally reduced to (i) exploring in the country raw materials needed to produce nuclear power and (ii) strengthening the ongoing nuclear research programmes, among which Saha's cyclotron and other projects and Debendra Mohan's transuranic research in the Bose Institute found due places.

The draft minutes of the first meeting of the Committee in Mumbai (15 May 1946), as well as the Press Release observed that on account of the shortage of available fund no large scale programme in nuclear physics could be conducted in the country except at a central place, and that this central place would be TIFR in Mumbai. Given that Kolkata was much ahead of any other place in the country in nuclear physics, and that TIFR had not even made a start, the second half of the resolution seemed out of the ordinary. In vain did Saha try to argue with Bhabha.[10]

that Bombay, being a coastal city, was too vulnerable for that. Besides, this choice was never discussed in the meeting. On the contrary, he added, when the necessity of having a central nuclear research institute in the country was brought up in the meeting, the issue was at once relegated to a later time. Bhabha, however, ignored the query until some time after the interim government took over (on 2 September, 1946) with Nehruji as the leader, when he firmly stood his ground. By then, a certain change had come over Bhabha. He became persuasive as authoritative. Before the second meeting of the ARC on 21 February 1947, he exacted of Saha a confirmation of the minutes, first verbally when thrown together by chance in Delhi Meteorological office on 10 January 1947, and finally, in writing. Bhabha insisted on the latter, for unsavoury remarks were already afloat in the air about his high-handedness.[11] A hapless Saha saw the centre of nuclear research shifting away from Kolkata to Mumbai. Bhabha had won his first hurdle. Saha did not have much of a choice. He could not afford to upset Bhabha now. Any recommendation for financial support to his project or any related work would now have to come from Bhabha, routed through the ARC. Though the Governing Body of the CSIR, of which Saha was a member, reserved the right of the last word, practically nothing would move without Bhabha's note of assent. Even Bhatnagar, Saha's old friend from Saha's days in London and now the Director-General of the CSIR would not dare do anything that lacked the Bhabha stamp. Saha had other problems too. Tatas, now having to support the TIFR had already stopped financing the Kolkata Project. Besides, Saha was considering establishment of an Institute of Nuclear Physics in Kolkata. Money, therefore, was of urgent necessity.

The first ARC meeting also accorded the TIFR the sanction to buy one Betatron, a machine superior to cyclotron both in energy and stability. In addition, it approved of Bhabha's requisition of ten scientists working for the machine. While all this passed as a requirement for atomic research, Saha had his own guess as to why Bhabha needed a betatron, - Bhabha was obsessed with his pet idea that artificial mesons could be produced in laboratory. The machine, having very little to do with atomic *energy* research would, in fact, serve cosmic ray research only. As announced in that meeting, Bhabha soon left for USA to negotiate purchase of a betatron. On the way he attended a Conference in Cambridge, UK, to which Bhatnagar led the Indian delegates. Saha was also a delegate but he went independently. From his letter to Kothari written from London before his departure, we learn Bhabha spoke there on his pet topic - mesons in laboratory - though the assembled physicists by and large doubted if the-then high-energy experiments ever gave any indication of it.[12] It was long before the second meeting of the ARC would be held.

2.1 The two approaches to nuclear science

The divergence of the two men's approach to nuclear physics should now be clear. Saha's was one of an academic nature. He wanted to explore nucleus and learn the physics of it, just as a university teacher would do. Building a cyclotron drew inspiration principally from this, though to ensure Tatas' patronage he had based his application on the ground of its medical utility. Producing radioactive isotopes, offering radiation therapy etc were among the usefulness he cited. It may have a prehistory. Saha was certainly aware, Sir Dorab's wife had died of leukemia. Like Saha, and perhaps before him, Lawrence's brother had also approached the Tatas for a fund to set up a medical school in USA. Saha's intention was genuine, as was proved later. Not only he envisaged but also initiated, as quickly as possible (and long before anybody else in India), biophysical work in his laboratory with this social bearing of it in mind. Production of atomic energy was not on his agenda then, though he knew it would have to be addressed one day when the country was ready with the infrastructure. That would take many things like, training of personnel, survey of raw

materials, their production and processing and most importantly, the supporting heavy industries. In the Planning Committee he and his colleagues have considered it all, even working out to the finest details the tasks lying ahead. To his mind in 1939, it would be some time before the country could consider production of atomic energy. He for one would rather work to cut down the wait. Soon after founding his Institute of Nuclear Physics, a Post-MSc Training Programme would start there to rear personnel. That, again, was the first training course in nuclear physics within the country.

2.2 Atomic energy production

To fully appreciate Saha's initial stand-off to production of atomic energy, let us see what are its basic requirements. We begin by taking a quick look at the principle, and then, the practice. As we all know, each atom has a nucleus surrounded by a number of electrons (Atomic Number). The nucleus has a positive charge equal in amount to the total negative charge of the electrons. It is a very tiny and compact body made of nearly massive protons and neutrons, of which neutrons are charge-neutral and protons each carry a charge equal and opposite to that of an electron. Besides Atomic Number (which is also the number of protons in the nucleus), an element is also charaterised by the Mass Number (the total number of neutrons and protons in the nucleus). Elements of a given Atomic Number may have a number of counterparts called isotopes with varying Mass Numbers. Not all nuclei are stable. Of the known 1000 nuclei, only about 280 are very stable. They have more or less equal number of neutrons and protons. The rest forming the majority have more neutrons than protons and are unstable. They split easily when hit by the right kind of particles (neutron, for example) of the right energy. The process is known as fission and the elements, fissiles or fuels. There is yet another class of elements which are not fissile on their own, but can be so converted, - these are called "fertiles". In either case, when a nucleus splits, the mass of the fragments taken together is not the same as that of the original nucleus, and this difference in mass is released as energy. This has long been predicted by Einstein (1905) from the Special Theory of Relativity. Thus, to get atomic energy this way (there is yet another

way called fusion which is not of our concern for the time being), we must have fissile material to begin with. Uranium having an Atomic number of 92 and Mass number of 235 (usually written U-235) is fissile. However, the other isotopes having mass numbers 236, 238, etc are not. The natural uranium ores mostly contain the U-238 variety with U-235 only in 1 out of 140 parts. U-238, however, is fertile. Enriched Uranium contains less of this material. The 235-variety undergoes fission with slow neutrons, producing, on an average, more than 2 neutrons per fission. These are in general energetic and have to be slowed down by heavy water (unlike ordinary water, molecule of which contains two Hydrogen and one Oxygen atoms, the heavy water has the Hydrogen atom replaced by Deuteron, - an isotope of Hydrogen with an extra neutron in the nucleus) before they are able to cause fission of the remaining U-235 nuclei. The process propagates in a chain and releases an enormous amount of energy in the form of heat and light. The heat is removed by a circulating stream of heavy or ordinary water subsequently used to drive turbines. A reactor or a pile (a small reactor) is a special arrangement to have this chain reaction proceeding in a controlled manner, so that at any moment the available number of neutrons, capable of causing fissions, never exceeds 2 on the average. Otherwise, it turns into a bomb. As a preventive measure, high-quality graphites are used within a reactor to absorb the unwanted neutrons at the required rate. Reflectors are used to keep the neutrons confined within the reactor preventing leak-outs.

When the whole mass of U-235 is "burnt up" this way, the process comes to an end. However, if there be some U-238 present as impurity, these absorb the fast neutrons and become U-239. After emitting two electrons (beta particles) in succession this turns into Plutonium-239. It is fissile and may be used to produce another fissile material, namely U-233 from Thorium (Th)-232. For this, however, it has to be separated from the remaining U-238 in a special recovery plant. The recovery is quite an involved and elaborate process.

It is clear that given the machinery, the first requisite for a reactor or a pile (small reactor) is the fuel, that is, U-235. One must ensure that we have it. It is something that no country will readily part with.

Thorium, which we have aplenty in the country is useful only at a later stage. That is not all. As I said, a reactor calls for specialised machinery as also quite a bit of engineering feat involving heavy industries. Of the materials, U-235 apart, one needs to have high purity graphite, heavy water, and last but not the least, high-quality steel for the reactor container. In 1948, availability of all this stood uncertain if not unexplored. Finally, one must have a complete control over the sequence of the various processes proceeding in a reactor for which no indigenous expertise was at hand. No wonder, Saha did not give the atomic energy production a priority when pleading for a cyclotron. To him it was not for smashing atoms for energy. His homework for the Planning Committee mixed with his sociological interest had given him a fairly good view of where the country stood in the 1940s. With the AE Commissioners refusing to participate in the Planning Committee exercise despite repeated calls (Bhabha had not returned then), none of them was any the wiser regarding the country's economy, sociological structure and the resources.

In the face of it all, Bhabha's drive for atomic energy production appears hasty and premature. Besides, from what he wrote to the Tatas, despite his oblique reference made therein to nuclear energy (and that too, according to him, was to be relevant a couple of decades later), one had gathered, all he wanted to do was about the same thing as Saha had wanted to, but on a different scale. For some one who pleaded for an institution for doing fundamental physics, a sudden turn of interest to such an involved technology as of nuclear power production is bound to evoke surprise, if not misgivings. Was he seeking a career of his own in it? Was it to wield power through this construct? Was it to prove to his father that doing physics fetches more than an executive post in the Tata enterprises can? One is easily given to apprehend as though he was after something other than what was announced. Everything appears strange on a sudden at this turn.

As we shall see, our apprehension is not ill-founded. It is supported by the still stranger method that he employed in pursuing the new objective of his. He sat on the project for a long time, and then suddenly rushed to build a superstructure without caring for the

necessary foundation. Since the inception of the ARC, it took Saha to repeatedly remind him of the intermediate steps to the goal and the necessary homework, but Bhabha, armed with Nehruji's protection and the international connection he acquired from his days in Cambridge would not heed. Bhatnagar, his trusted lieutenant, kept assuring Saha that "Bhabha is singularly free from ego" and would welcome Saha's suggestions, which in reality Bhabha never did. The game was already afoot. A personal ambition versus a national cause. It ended with the former winning and the latter perishing in oblivion. All with Nehru's help, more indirect than direct. The result is, Saha got buried in the official history of the Indian Atomic Energy Programme, and despite Bhabha's larger than life picture projected by the Government machineries, the country at large is yet to reap the benefits of Atomic Energy even in sixty long years.

3. Change of guards

Perhaps, it is worth taking a look at the initial dynamics of the game. As said earlier, the war had seriously hit the Kolkata Cyclotron project. Some vital components of the machine, despatched by Nagchaudhuri from the USA got lost as the Japanese torpedoed and sank a cargo ship in the Pacific near Singapore. Pestered by questions from close quarters, Nehruji apparently was also getting a little impatient with Saha. At this juncture, Bhabha entered the scene. He appeared to Nehru as more dependable. As said earlier, he also had an easy access to him because of the family connection, a facility Bhabha carefully cultivated after one point of time. Saha lacked that. Whatever he had acquired during his days in Allahabad and through the Planning Committee work, it did not last long for a reason to be clear soon. From a perusal of the letters exchanged between Saha and Nehru in the initial phase of the Planning Committee, one cannot but sense a very humane and emotional touch in their relation, especially from Saha's side, - he appears to have taken Nehruji as his trusted guide, - a notion that he treasured till the end of his life. It is on the strength of it that he had, on occasions, submitted to Nehru his reservation about anybody and anything, sometimes not without emotional outbursts. But as early as in 1939, while working for the

Planning Committee, Saha made a mistake in diplomacy. Somewhat apprehensive of Gandhiji's influence on Nehruji, he feared that the recommendations of the Planning Committee might go waste because of this. In a letter written to Krishna Kripalani, Rabindra Nath Tagore's the-then secretary, Saha[13] even expressed this feeling and wanted Tagore to counsel Nehruji against such a possibility. This letter was inadvertently brought to Nehruji's notice. It was then that Nehruji realised, Saha's course was somewhat different from his own. That, I believe, somehow put off Nehruji. Saha was most probably not aware of it, for there were no explicit indications from Nehruji's side. Shortly afterwards, when Nehru's help was sought for the cyclotron, Saha got it freely, but the warmth was losing. In 1945, when Bhabha and Nehru came close together, the Saha-Nehru relation was already cold. Nehruji began to develop a strong liking for this young man - Bhabha - draped in aristocracy, intelligent and gifted with fine tastes. With his lofty ideas, Bhabha was a dreamer like he was. In short, Nehruji found in Bhabha a wonderful match. Bhabha's associates had also played a role in hastening the change in Nehru's attitude towards Saha. Bhatnagar was merely a name to Nehru until 1946 when he was personally introduced by Saha.[14] But with his cunning, and strangely, to some extent with Saha's successful move to ensure for him the rank of a Secretary, Bhatnagar became close enough to Nehruji to influence his opinions. It is through these new associates that Nehruji gradually drifted to doubt Saha's worth. He then let the rein of the atomic energy work completely in Bhabha's hand. Saha was reduced to "taking orders from" someone sixteen years junior to him. With these words, let us now return to Bhabha's itinerary.

3.1 Atomic energy work on hold

Bhabha came back from his first post-war foreign trip towards the end of 1946, beaten in his mission. Following the war, an extra-cautious USA would not sell betatron to foreign countries. It would not even share with them anything having remotely to do with Atomic Energy. As a result, Bhabha had to resume his cosmic ray research, engaging in the programme the ten scientists already recruited for the envisaged betatron work. He reported this development in the second meeting

of the ARC held in Mumbai on 21 February, 1947. Prior to this meetimg, Saha had urged Bhabha to arrange it in Delhi, because the CSIR Budgetary meeting was scheduled there about this time. He thought it wise for it would minimise the delay in transmitting the recommendation of the ARC to CSIR and expedite release of the fund towards his cyclotron work. Besides, having a prior engagement in the third week of February, he would not be able to make it to the meeting were the time and venue not changed. Bhabha did not budge an inch. Instead, he asked Saha to depute NN Dasgupta, a brilliant student of Saha in his place. From a letter written to Bhatnagar[15], it appears that in that meeting Bhabha submitted a schedule of work which Saha considered rather amateurish and somewhat irrelevant to atomic energy. "It would only serve cosmic ray physics", he wrote. A disappointed Saha sent Bhatnagar a caveat, "The Committee would not be discharging its duties towards the country unless it can prepare a more comprehensive scheme, but the defect is that when the scheme is proposed by some one of us it is never considered" [*ibid*]. This proves our point, Bhabha was not listening. Assured by Bhatnagar, Saha, however, submitted a proposal urging the Committee to define in precise language the ground it wanted to cover, regions of interest, the effort needed, and to propose the lines of action and steps to be taken in order of priority to implement the plans. "It should define", he added, "its attitude with respect to the requirements of the defense department as well as the peacetime utilisation of Atomic Energy". We realise with Saha that in about two years of its existence the ARC had not defined these objectives. Saha also urged the Committee to collect data regarding the personnel available in this country for Nuclear Physics Research and to take a stock of the facilities available in the laboratories for giving instruction in Nuclear Physics.

This one point would remain neglected for six years after the inception of the Atomic Energy Commission a few months later. The Committee, Saha said, should also draw up plans for a Central Atomic Research Institute on the lines of the corresponding Canadian, British and French Institutes. Apparently, none of these suggestions was heeded, for months later, Saha was unhappy with the way the ARC was functioning[16]. On the other hand, Bhabha, then in Simla (June

1947), was advising Nehru against Bhatnagar's proposal to create a Department of Scientific and Industrial Research in the Government itself, of which BSIR, together with ARC was to remain a part. While one cannot help detect in the proposal a shade of power loving Bhatnagar, there is also the feeling that Bhatnagar was not alone in the game. He had a mighty contender there. It was not possible for Bhabha to ignore Bhatnagar in the ARC, - for Bhatnagar was Secretary of the ARC by right of his position in the CSIR, but right from the beginning Bhabha was dying for complete independence and could not wait to get Bhatnagar out of the way. In fact, Bhabha could hardly stand anybody and anything between him and Nehruji. However, aware that Bhatnagar had already rendered a great service to the country by beginning to set up one national laboratory after another, Nehruji refrained from taking any drastic step until 1954.

3.2 The victims of the ARC

Meanwhile, the resolution passed in the ARC's first meeting had began to take its toll. Sir CV Raman in 1938 had sent one of his students, RS Krishnan to Cambridge to gain an expertise in Nuclear Physics, so that on coming back he could start a small nuclear physics unit in IIS. On his return some time in 1947, he duly submitted his project plan. A Review Committee under the chairmanship of the then director Sir JC Ghosh was set up within the institute to assess its feasibility. Saha, Raman, KS Krishnan, Bhabha and his close associate, HJ Taylor were its members. Ghosh, Raman naturally, and Saha despite his project in Kolkata were quite in favour of the proposal. Yet, it was turned down on the ground that the Institute did not have the required money and infrastructure to support it. For the real reason one has only to peruse a letter[17] of Bhatnagar, preserved in NAI, urging Bhabha to nip the proposal in the bud. Although not explicitly mentioned, this decision seems to have complied with the ARC resolution of not allowing any new nuclear physics centre to grow in the country. It is also responsible for denying the universities facilities for doing serious nuclear physics research.

Though IIS and the universities were the first victims of the ARC, very soon the existing centres also began to feel the squeeze. The

ARC was replaced by a Board of Research on Atomic Energy (BRAE, Atomic Board, in short) put directly under CSIR sometime in the mid-1947 and definitely before 26 August 1947 when its first meeting was convened. When a project on Beta-Ray Spectroscopy in Saha's laboratory was tabled, it received approval subject to some clarifications. But before the clarifications could be considered, Saha and Bhabha separately went abroad. Both of them were to attend the Rutherford Conference in Paris. Later on, Saha was to visit several atomic energy establishments in Europe, and Bhabha to go to some places in Europe, USA and Canada (November-December, 1947) on multiple missions. Bhabha had to buy plastic balloons suitable for his high altitude cosmic ray research. He had to find suitable faculty members for his institute. Visiting several atomic energy establishments in Europe and America was also included in his tour programme. Saha was receiving reports from various quarters that Bhabha was making tall claims in USA on the achievement of the Indian atomic energy programme when, in actuality, it did not amount to much. On the other hand, during his trips to numerous places in England and Europe, Saha was painstakingly collecting extensive data and information regarding their Atomic Energy programmes. In Paris, both he and Bhabha had separately consulted Frederik Joliot-Curie, the left-minded scientist, whom the rightist President General de Gaulle had appointed leader of the French Atomic Energy work. Saha was quite impressed with the French progress and was happy to get from them an assurance to help India build a pile. He was doubly touched by their openness. On his return he submitted (7 February 1948) a detailed report of his survey to the Board Chairman for consideration in the next meeting. There he suggested adoption of the French model for, as he argued, the condition in the two countries were somewhat identical. The country, under Joliot-Curie's leadership had engaged all able scientists including chemists and geologists in their atomic project. As a result, France, initially unaware of the uranium deposits within her own confines had found enough of it to build an atomic pile. This was indeed a great achievement in the face of the American resolve not to help any foreign country including France, though the French had done a lot for the Manhattan project from Canada.

3.3 Towards an Atomic Energy Commission

Back from his trip to USA and Canada, Bhabha briefed Nehruji about his experience in the West. By then, he was already bent on creating an Atomic Energy Commission in India like they have in the UK, Canada and USA but with a designed difference, as we shall find later in this article. In fact, he had also taken some definite steps of which, possibly, only Nehruji had some knowledge. He acted as though the AEC was only a few days away. Through AEC, Bhabha would again try to get independent of ARC or BRAE and with it, of Bhatnagar. While this transaction is usually glorified as an essential step to achieving success in the Indian Atomic Energy Project, it is at best an autocratic move based on a personalised decision. Bhabha could not wait to taste power.

Saha learnt of the BRAE meeting first on 3rd April, 1948. Again, he pleaded with Bhabha to reschedule the meeting in Delhi sometime in the middle of the month. The reasons were two-fold. The foundation stone of the building of National Institute of Science (later renamed Indian National Science Academy, INSA) was due to be laid in Delhi on 19 April, an occasion most of the scientists including Saha would like to attend. He said, being a university teacher, it would be difficult for him to leave Kolkata twice within such a short time. Besides, he badly wanted to have his report tabled and debated in the meeting, and as his suggestions called for a close collaboration among a number of government departments, he would like the Prime Minister, and the Minister for Supply and Disposals to be invited there. Bhabha as usual did nothing to suit Saha. On 6 April Saha came to know that the venue of the meeting stood unchanged, that is, Mumbai, and the date, 9, 10 April, 1948, as scheduled. Even then, he did not receive the agenda paper. At such a short notice he could not find passage to Mumbai. Later on, from Bhatnagar, visiting Kolkata on 29 April, he came to know that Bhabha had not taken kindly to his report. What is more, Bhabha had found a few factual errors in it. It is not known if Bhabha ever replied to Saha's call to point them out for rectification.

It is hardly a matter of coincidence that after the first ARC meeting, Saha was not present in most of the meetings, be that of the Board or

of the Committee for one reason or another. One suspects, Bhabha did not much want Saha to attend these. He definitely did not wish to see him present in the meeting scheduled on 9 April, in particular. For there he had to get a very important issue passed without much of a hassle, — something which would be impossible to achieve were Saha present there. Bhabha would have to justify his authority which he usually hated queried. It concerned something that Bhabha had drawn up on his own without consulting anybody in the Board, and had rushed immediately to realise it, like he did on numerous occasions.

3.4 The untold story

Actually, during his 1946 trip, Bhabha had visited Canada in addition to France, England, Norway and USA. In Canada, particularly in Ottawa, he had seen WB Lewis, one of his Cambridge friends then occupying an important position in Canadian Atomic Energy Project. Homi had convinced him that an Atomic Energy Commission in India was in the offing, and as though it were already formed, had even struck a deal with him. By virtue of that Canada was to sell a ton of crude uranium oxide to India in exchange of the latter's keralite sand rich in thorium, an element which Canada lacked for their reactors. Ordinarily, there could not be any objection to this deal, for India had it aplenty in the state of Travancore. The trouble is, in the first AEC meeting, the Committee was committed to protect it against pilferage and unauthorised export. Besides, the deal presupposed an authority that was yet to come. The most important thing, however, was that Bhabha was to keep the deal a close secret. While submitting his report to Nehruji, he urged him to table the Atomic Energy Bill. A draft of the Bill was received by the members of the Governing Body of the CSIR for on 9 April, Saha writes to Sir J. C. Ghosh, a co-member, saying he had received it but did not have the time to "examine it thoroughly", but he hastened to add, "still some of the clauses of the bill appear dangerous. If the Government of India has only got the present close body in Atomic Energy Commission (Saha writes Committee by mistake) as it is selected (e.g., it has no chemists

there), they may not give right advice to the Government. We shall take (a) little time to consider the bill and give our opinion. I would also suggest that before the Bill is passed into Act, opinion of the National Institute of Science should be obtained"[18]. In the same letter, he requested Sir Jnan to send Syamaprasad Mookerji, Hon'ble Minister of Industries and Supply a copy of Saha's report which Saha had already given him. Next day, Saha also wrote to Syamaprasad[19] repeating the same observation. In this letter, his apprehension turned into a fear that this government monopoly, as advocated by Bhabha and his men and agreed to by Nehru would stifle to death the Atomic Energy Project as also all nuclear physics research in the country in general. In fact, in it he also cited many instances of Bhabha's ill-attempt to foil Kolkata's effort in this direction. In both the letters there was an explicit urge to have his report reaching Nehruji's hand. There he named many countries, where such endeavours have derived immense benefits out of the small groups formed of able university scientists, each headed by an expert in the subject. Saha had the apprehension that Bhabha would ignore his report and would not even mention of it to Nehruji. We can now understand, why was Saha so much insisting on holding the meetings in Delhi, for he wanted the Prime Minister, with whom his direct contacts are not as easy as before, to be present there. He wanted the PM to realise what other countries were doing and, in contrast, what Bhabha was trying to do in this country. But every time Bhabha was quick enough to foil Saha's bid.

3.5 The Atomic Energy Bill

Let us now see what were the salient features of that bill placed by Nehruji in the Constituent Assembly on 6 April, 1948. When passed into an Act, it would simply mean that the government retain exclusive right to monitor and control all atomic work in the country including industrial production, development and trading of such materials as would be relevant to atomic and nuclear research. The list of proscribed materials contains Uranium, Plutonium, Berrylium and their compounds. Besides, it lays down a long list of what are the things *not to do*. To quote Saha, "it does not tell us what to do, but it simply

tells us what is not to be done. We shall not export nepturium, we shall not do this, we shall not do that, and so on". But it hardly tells you what are to be done. Later on in 1953, some more materials were added to the list of proscribed materials like, radium, deuterium and lithium. For most of the materials, as Saha pointed out[20], proscription was meaningless and would only betray the imbecility of Indian scientists. The bill also empowered such a person as the Government would think fit, to ensure adherence to the prohibitory order. It was clear, who that person would be.

3.6 The crucial Board meeting

In the meeting of April 9 and 10, 1948 in Mumbai, the Board resolved the following. Firstly, in view of increasing need for development and expansion of Industries in the country, the Government is advised to set up as soon as possible a small atomic reactor. A sum of fifty lakh should be allocated for this and another thirty lakh for the related infrastructural facilities and research. Secondly, in view of the escalating cost and demand for heavy water, the Government should try to ensure a provision of a good amount of heavy water and to develop extensive and low-cost hydroelectric power-stations as also to see to it that heavy water industries were developed in the country as quickly as possible. Thirdly, the entire survey of the materials (including the proscribed ones) needed for atomic power production would be conducted under the leadership of MS Krishnan and all its reports were to be kept secret and submitted directly to the Board.

Bhabha knew he would have to do quite a bit of explaining to Saha, were he present in the meeting. First of all, Saha would ask wherefrom would the fuel come, where would we find the technical hands, etc. for previously he had repeatedly asked the Board to mind these, and as far as he knew, nothing much was done in that direction. He could even query the secrecy and ask a thousand other questions. Bhabha would not be able to answer most of those, for with Lewis he had pledged secrecy. He would officially brief Nehruji some of the results of his visits a few days later.

4. The Atomic Energy Act

Then came the final hour. On 15 April, 1948 the Atomic Bill got passed in the Parliament. Some raised objections which were quickly overruled. The NIS did not even have the time to consider the Bill and advise the Government. Eleven days later, Bhabha sent Nehruji a long note appending with it the resolutions adopted in the last BRAE meeting. Bhabha writes:[21]

"The quickest and most desirable way of developing atomic energy in India would be to come to an agreement with the Governments or atomic energy agencies of one or more countries such as Great Britain, France and Norway. Such agreements would be on mutually advantageous terms involving the exchange of raw materials used in the generation of atomic energy and the pooling of scientific and technical information. It must be clearly understood that the possession of sufficient quantities of uranium is a *sine qua non* for the generation of atomic energy. Thorium can only be used for this purpose after it has been treated in an atomic pile in such a way as to generate a particular variety of uranium in it. A pile cannot be started without uranium or plutonium, which is a substance generated from uranium in a pile.....

"In deciding on the structure of the organisation which Government must set up in order to develop atomic energy and research on a bigger and more effective scale than hitherto, the following two basic facts of situation must be taken into account.

i) Absolute secrecy will have to be observed and ensured with respect to any secret information given to us by a foreign atomic energy agency.

ii) The paucity of the scientifically and technically trained personnel will require some of the top people to do more than one job at the same time. These two conditions by themselves practically determine the essential structure of the organisation.

"Condition (i) requires that the development of atomic energy should be entrusted to a very small and high-powered body composed of say three people with executive power, and answerable directly to the Prime Minister without any intervening link. For brevity, this

body may be referred to as the Atomic Energy Commission (*we shall refer to this as AEC*).

"The present Board of Research on Atomic Energy cannot be trusted with this work since it is an advisory body which reports to the Governing Body of the CSIR, composed of 28 members including officials, scientists and industrialists. Secret matters cannot be dealt with under this organisation.

"The same conditions of security require that the AEC have its own secretariat independent of the secretariat of any other Ministry or Department of Government, including the envisaged Department of Scientific and Industrial Research."

Bhabha furthermore emphasised that "the AEC whose work has important international implications must always be attached directly to the Prime Minister, and I am, therefore, strongly of the opinion that it should from the very start be organised directly under the Prime Minister and not as a part of the Department of Scientific and Industrial Research. Full coordination of the activities of the Department of Scientific and Industrial Research would be ensured by the circumstances that the Director of Scientific and Industrial Research would be a member of the Commission and act as its Secretary for ordinary administrative purposes."

"In view of the above considerations it is desirable", Bhabha further wrote, "that Government should take the following steps immediately

"(1) An Atomic Energy Commission should be set up directly under the Prime Minister. It should be a high-powered body consisting of three scientists and composed as follows
  (i) Chairman
  (ii) Director of Scientific and Industrial Research
  (iii) One other eminent scientist (Sir KS Krishnan, FRS, is suggested)

"(2) The Atomic Energy Commission should have its own secretariat.

"(3) Government should decide on the sums of money that it wishes to allocate for the development of atomic energy within the next three years. A sum of approximately Rs 50 lakhs will be required if it is decided to build a small pile while additional

rupees thirty to forty lakhs will be required for other atomic research projects, both fundamental and applied".

Several things are worth noting here. Let us first take up the phrase, *The quickest and the most desirable way.* Quickest is perhaps understandable. It is always quicker if we get it from others than doing it by ourselves, especially when the AEC did nothing to ensure that we can do it to a large extent on our own. But why the most desirable? Who decided it? Then the clause, *Absolute secrecy will have to be observed and ensured with respect to any secret information given to us by a foreign atomic energy agency.* What kind of secret information the AEC expects from other Governments? The French never made a secret of what they did and how. And, as we shall see, by this clause alone, the AEC excluded the scientists of the country, and with it the lay public from knowing what it was actually doing. Instead of taking the advantage of their acumen and service, the scientists of the country were completely denied access to the activities and achievements of the AEC. This makes a huge difference with the Atomic Energy Establishments of most of the Western countries which I had earlier alluded to. There, almost all the able scientists were organised and pressed into service in such an activity of utmost national importance. However, India, a la Bhabha chose to ignore her own scientific pool totally.

Let us now take a closer look at the composition of the AEC. The only two members of it were Bhatnagar and Krishnan. Bhatnagar, a chemist of an average calibre, was simply unavoidable at that point of time. It was not only for his position but also for his energy and ability to get anything done. Though sensing traits of high ambition in Bhatnagar, Bhabha had found him quite obliging and convenient upto a certain point of time. Krishnan, on the other hand, was a scientist of considerable standing, whom they say Raman had done wrong by not sharing with him the credit of discovering the Raman Effect. He was Bhabha's old time associate from the Raman circle in Bangalore. Averse to entering into any controversy, Krishnan was too gentle to query any of Bhabha's moves. He was not the type. That way he would not cause any trouble for Bhabha. In fact, he once bore the brunt of Saha's criticism for arbitrarily quantifying at Bhabha's

instance the pool strength of the Indian technical expertise in nuclear science. However, if Bhabha ever had any respect for anybody, KS Krishnan certainly was one. In a word, Krishnan was eminently acceptable to Bhabha.

As Saha rightly observed, the AEC did not include any chemist. Obviously, Bhatnagar did not count, for his role was, as Bhabha mentioned, to run the ordinary administration. By this composition, Bhabha ensured that nobody in the AEC would ever question his moves, and as a result, AEC would be a one-man show like he desired it to be.

On more than one occasion Saha had, in vain, suggested utilisation of the service of the inland scientists including chemists in the universities and geologists from the Geological Survey of India. As early as 3 April, 1948 we find him writing[22] to Bhabha to consider (i) investigation of chemical methods of extraction of uranium oxide from low-grade uranium containing minerals, (ii) purification of uranium oxide and their conversion into Uranium Fluoride later to obtain pure uranium by elctrolysis of the fused salts. In this connection he also asked him to start pilot-plant methods for production of fluorine and hydrofluoric acid from minerals obtainable in our country. He also urged to undertake similar investigations with the thorium containing ores, to consider purification of locally obtainable graphite and aluminium boron and berrylium metals to the required degree of purity for atomic research purposes. He even asked him to organise a supply department for procurement of materials required for the same purpose both from local sources and abroad. In the ARC meeting held six days later, Bhabha hardly mentioned these.

Surprisingly, much later, around 1954 Bhabha would indeed require a chemist. Even then, he considered inducting only a British Chemist in the AEC. All along, he had sought foreign helps but not a single one from his own country. Instead of beginning to explore Uranium in the country and upgrading them to the required purity with Indian help, he had it done from the West. PMS Blackett in England would render him a great help in this regard a few years later. This, of course, is not meant to imply that Bhabha took all the foreign suggestions without weighing their merits. There are instances when he would be found at times seriously querying even their proposals.

5. The Atomic Energy Commission

Be that as it may, on 10 August, 1948 the Atomic Energy Commission was formed, and Bhabha the appointed Chairman. Five days later, on the first anniversary of the Indian independence, the Atomic Energy Act was passed. Contrary to Bhabha's wish, and by Nehruji's careful consideration not to upset Bhatnagar, the AEC remained under the BRAE.

Let us briefly recall the objectives of the AEC[23]. These were

1. To survey the country for raw materials
2. To take steps to develop these materials industrially
3. To set up a nuclear reactor within five years
4. To promote fundamental research in its laboratories

We notice that these objectives, excepting the third were nothing new and were already voiced in the ARC meetings. Also to be noted is that Saha had been constantly reminding Bhabha and Bhatnagar to define these objectives in clear terms and do the necessary homework. It took more than two years and a half to finally announce their programme. Even then, "a very important object, 'Training of Personnel' was omitted". In the programme of all other countries which seriously undertook development of atomic energy the training of personnel has been one of the chief objects, for without proper personnel who will plan, organise and execute the work? In this matter we cannot expect any effective help from foreigners.

On the other hand, immediately after the AEC was set up, it was officially announced that the trained scientific personnel for atomic energy work in this country did not probably exceed a hundred. It is not clear if this figure was taken from the roster of scientific and technical personnel maintained by the Ministry of Natural Resources & Scientific Research or AEC, or if the annual increase of such personnel ever noted and considered adequate. It was expected that the AEC would suggest a remedy if the number and the rate were found inadequate. To have an estimate, let us recall that in 1953 the Atomic Energy personnel in the UK, on the pay-roll of the Atomic Energy Establishment itself was 11,000 excluding those in the Universities and research organisations in industry. In the USA, such

personnel was stated to form 5% of the total technical personnel of the country, which amounted to nearly a lakh and a half. It appears, in comparison, that India had practically no personnel at all for atomic work. And yet, the AEC did not initially include training of personnel in its objects. However, in spite of this, Bhabha during his Tokyo visit (23 September, 1953), had claimed, work on the atomic pile in Bombay was already under way and the time table called for its completion in three years. He estimated that within five years of its completion the people of India would begin to enjoy the fruits of an enormous new sources of power whose benefits, integrated with the hydroelectric projects already underway, would greatly raise the standard of living all over the country.

From these two letters[24, 25] one gets to learn two things not widely known. One, that Nehru had a discussion with Saha before the formation of the AEC. Saha writes to Nehru, "You may remember I had some talks with you before the AEC was created. I had some misgivings which I expressed freely to you, but I thought it prudent to allow the body to work for some time before we review its work" [24]. And two, that Nehru had wanted Saha to be a member of the AEC, for Saha writes, "You may remember that before our AEC was formed in 1948, you called me by phone to Delhi and were kind enough to offer me a seat on it. I declined the offer with the remark that the arrangement would not work"[25]. It was very natural for Nehruji to have discussed with Saha the formation of the AEC and have wanted him to be a part of the AEC, for at heart he appreciated Saha's initiation of Nuclear Physics in the country. On the other hand, Saha, in his brief response, had summarised with a remarkable brevity his own sad experience. Time and again, he had seen his suggestions belittled and often ignored by Bhabha. He knew, Bhabha would prefer to have his own way in everything and would not listen to anybody. The misgivings Saha said he expressed to Nehruji stood mainly on this ground. Besides, for reasons unknown to him, right from the formation of the Interim Government, he had found Bhabha opposing almost each and every move of Saha that had to do with Nuclear Physics and Indian Science, in general. It may be mentioned that in

1947 Bhabha stood in the way of Science & Culture getting a fund from UNESCO[26].

One wonders if Bhabha derived this peculiar attitude towards Saha from his one-time patron, Sir CV Raman, who, it was widely spread by himself and his cohorts, was forced to leave the IACS because of Saha and his associates. By the time Bhabha fell out with Raman (Raman never liked Bhabha becoming an aid to the Government), he had began to look upon Saha standing in his way. Besides, he always detested anybody trying to "preach" him. Once afflicted by all this, he seems to be involved, either directly or indirectly in an undeclared war with Saha after a certain point of time, and in it, he almost always had Bhatnagar to his aid, though Bhatnagar at a personal level appears to have a tender heart for his old friend Saha. In this connection one may mention a curious incident. In 1952, when the Institute of Nuclear Physics (INP, now known as Saha Institute of Nuclear Physics) had been in existence for two years or so, there was a devious move, again through Bhatnagar, to remove Saha from its Directorship by first making him director of the Indian Association for the Cultivation of Science (IACS) in Kolkata and then insisting that he could not hold two positions at the same time[27] in a bid to remove him from the INP. Without Saha it would be easy to force closure of the Institute by stopping all aids to it. Though Bhabha had to accede from time to time to the requests of the INP for funds, and he eventually agreed to a 5-yearly fund-arrangement (21 March 1955), - both acts, I believe, being more to honour Nehruji's sentiments than anything else, - in fact, Bhabha had never taken kindly to its very existence, for the same reason as applying to the proposed nuclear physics unit in the IIS. In the present move the Bhabha-Bhatnagar combine had actually engineered a death in the cradle for the INP. The attempt, however, failed, but things were made immensely difficult for the INP.

6. Five years after the Indian AEC

It must be noticed that the earlier of the two letters of Saha to Nehru that I mentioned above, dates from 1953, five years after the AEC was created. That is the tolerance period that Saha allowed the AEC, the time the latter said it would take to deliver a reactor. Saha

had assured Nehruji that he would wait that long before reviewing its work. Meanwhile, through many of his students and friends abroad, and often by himself visiting the places, he had collected enormous volume of data on the Atomic Energy work done elsewhere, and was regularly passing them on to the Government either directly or through the pages of *Science and Culture*, an organ of the Indian Science News Association started by him in 1934. Apparently, it was wasted on Bhabha. At the end of this period, Saha's patience broke down. As of then, the reactor remained a far cry. The AEC had just sent a team to study the pile technology abroad, a task that was long overdue. Saha writes to Nehru[28]:

"The AEC has now been in operation for five years and though it has enveloped itself in a cloud of secrecy, which many of us consider to be extremely undesirable, we are now enabled to some extent to form an estimate of its work. Many of the eminent Indian scientists who take great interest in Atomic Energy have been associated with me in this examination process and at their request I am addressing this letter to you giving the views of a large group of scientists in this matter. I shall be glad if you would kindly send these comments to the AEC and if you kindly ask them to reply to our comments. This is indeed in public interest. We shall keep their views confidential to six or seven select persons, till we can place our counter-views before you." Saha appends with it 17 fullscap typed pages entitled "The Atomic Energy Commission of India". This includes an assessment of its work vis-à-vis the announced objects.

The report, to begin with, severely takes on the AEC for maintaining a secrecy. "When the Indian AEC was started, it began to out-Herod Herod in Secrecy", he wrote, "In contrast to the AEC of other countries or their equivalents, it does not give any indication of its budget and no progress report (in the USA, they call it Report to the Country). Consequently, there is no authentic information of its achievements, programme and activities. This is against the procedure adopted by all countries. Secrecy is in fact doing great damage and creating wrong impressions. There are no reasons for not taking the eminent Indian scientists into confidence and obtaining their cooperation. They are being excluded by secrecy rules, whereas it is apparent from the

propaganda of the Indian AEC that foreign nationals are being taken into confidence for otherwise how could a man like Gordon Dean, once chairman of the AEC of the USA express an opinion praising the work of the Indian AEC? He must have been taken into confidence by members of the Indian AEC and given one-sided exaggerated ideas of their plans and activities. This is in strange contrast to the state of affairs in other countries like UK, and even USA, where almost all the indigenous physicists, chemists, geologists and engineers are being taken into confidence as either member of the AEC or of its Committee or as consultants or workers. They never take foreigners into confidence."

He specifically asks, "secrecy for what purpose? If it is to keep back information from foreign countries, there is hardly anything to keep back. There should be nothing to keep back from Indian scientists and experts who can actually be helpful. What are we trying to hide from our eminent countrymen who can render great help to Atomic Energy Development?

"There are no military or technical secrets involved which are to be protected. Moreover, on the admission of our Government we have no military ambitions and have no intention of developing atomic energy for military purposes.

"*Secrecy is being imposed by Indian AEC to hide its do-nothingness and concentration of all power and distribution of patronage in a few hands, and as far as the business part is concerned, making it the pocket bureau of a particular commercial firm.*" (italics mine.)

Regarding the survey for raw materials in the country, he writes "The presence of Uranium-bearing minerals in many places of Behar, Rajputana and Madras was already known to the GSI before the AEC came into the field. The presence of Thorium in the monazite sands of Travancore, and of lesser quantities of Uranium in the same mineral has been known since 1900. The AEC has just announced that it has discovered monazite sand in Travancore containing 4.5% Thorium, but it can be shown from geological records that it was known 30 years ago. The AEC ought to tell the public how many new deposits it has discovered, or whether it has ascertained the extent and quality of the deposits already known, or known as a result of the efforts of the AEC? Whether it has used any new type of equipment for

prospecting or using old methods? It is quite possible that the AEC has done something in this line, but on account of secrecy, it is impossible to make a proper estimate of its efforts. But it is obvious that its efforts are on a much smaller scale than those of France, not to speak of the British Commonwealth or USA or Soviet Russia."

In respect of taking steps to develop these materials industrially, he adds, "we are told that a factory has been working for the extraction of Uranium, Thorium and Rare Earths only from the last year, near Bombay, and this factory has been running in cooperation with a French firm. Our information is that the quantities of Uranium and Thorium ore already known in 1948, due to the labours of the GSI, were sufficient for the extraction of the quantity of Uranium for the building of a Pile. In this respect we were better placed than France. Why not a gram of U or Th has been extracted all these four years out of our ores by the Indian AEC? We do not even know if the metallurgical problems have been tackled and solved in these last four years. Has the Indian AEC taken care to associate Indian chemists and metallurgists to help in tackling of the processing by a foreign commercial firm? Had the Indian AEC instead of trying to concentrate power in a few hands, taken Indian Metallurgists and Chemists into confidence, we could have certainly devised methods for extracting more than 100 tons of Uranium to start work on the Pile during the last five years."

Regarding the fundamental research by the AEC, Saha wrote: "On account of secrecy, the public are not aware what fundamental researches are being done, or encouraged by the AEC, but it appears that most of the grants for fundamental research in the laboratories is being spent for Cosmic Ray Research and this is justified by the Chairman in the following words: The expenditure on Cosmic Ray Research has been fully justified for valuable new information has been obtained about the behaviour of elementary particles, at energies which lie beyond the scope of the largest accelerators etc.." Cosmic Ray work has no doubt great importance for knowledge of fundamental particles, but the Indian AEC is challenged to prove that it has so far played any role in atomic energy developments in the country. We shall be glad to hear from the AEC of India that any

other AEC in the world includes Cosmic Ray work in its programme... Our conclusion is, atomic energy funds are being diverted to other purposes, and atomic energy development proper is being neglected by the Indian AEC".

I have already mentioned Saha's reaction to the AEC Notification in 1953 proscribing a host of more materials. While sharply reacting to this, he had written to Nehru challenging the Commissioners to justify the proscription. He even wanted to be included in a discussion on the matter in the next AEC meeting. The meeting took place on 21-22 February, 1954 without inviting Saha.

6.1 Nineteen Fifty-four

SS Bhatnagar died of heart attack on the very first day of 1955. Only the previous year Bhabha's dream had come true with the Department of Atomic Energy (DAE) created directly under the Prime Minister and Bhabha made Secretary to the DAE, GoI. Rid of Bhatnagar, he was now not only the policy maker but also the holder of the executive power, answerable only to the Prime Minister. Prior to this, Bhatnagar was made the first Chairman of the University Grants Commission. It was again in 1954, that on the ground that TIFR was too small a place for atomic energy research, the huge Atomic Energy Establishment (renamed Bhabha Atomic Research Centre by the then Prime Minister Indira Gandhi after Bhabha's death in 1962) was founded in Trombay, Mumbai on a coastal land of 1200 acres. Bhabha, of course, was its Director. TIFR, by then spreading its wings to the old building of the Royal Bombay Yacht Club, also needed a new building. Bhabha had already acquired for it a piece of coastal land belonging to the Ministry of Defense, much to the displeasure of VK Krishna Menon, the then Defense Minister and a great friend of Nehru. The foundation stone of the Institute was laid by Nehru on 23 January 1954, and the building inaugurated in 1962 again by Nehru. For the building, Bhabha flouted all government rules, starting from engaging a foreign architect Helmut Birsch, whom he met on ship when coming to India in 1939, to furnishing. Bhabha always had to have the best, and with Punditji's patronage he got it almost always.

6.2 AEC selling beryl to USA!

Towards the end of 1954, Saha received a strange letter from Dr MS Patel [29. Patel to Saha, 3 November, 1954], a consulting Industrial Chemist, Chemical Engineer and Economic Geologist from Santa Cruz, Bombay. It was inspired by Saha's address as the Chief Guest in the Geological Mining and Metallurgical Society of India, published in the quarterly journal of the Society in December 1953. It says that he had noticed that the Indian AEC was exporting beryl (proscribed by the AEC under the Atomic Energy Act) to the USA making huge profits at the expense of small miners and poor labourers. He also enclosed with it a copy of his letter written to Nehru and that of the reply on the latter's behalf. He writes to Nehru, "Our AEC, it seems, is engaged in some activities, which perhaps may not be directly connected with the development of Atomic Energy in the country.. there are some activities in which our AEC is taking very active interest, but these activities are not considered to be the activities of AEC or equivalent bodies in other scientifically and industrially advanced countries...One of such activities, at present, is to purchase and then export Beryl, a mineral found mostly in Rajasthan and to a certain extent in the states of Madras and Behar. In 1947/48, our Govt passed a regulation prohibiting the export of beryl from this country, on the ground that it was required for the development of atomic energy in this country. The AEC made a profit of 84, 180 and 190% respectively for the years 1951, '52, '53.. Every country publishes figures of production, consumption and exports of Beryl, while in our country, these figures are considered secret and even the GSI does not have these figures". In reply, it was claimed that several atomic reactors exist in India (*that is a blatant lie! Au*) in which berrylium or its oxide is used as a moderator or reflector...the GoI in the DAE purchases all beryl mined in India for stockpiling. Only a small fraction of this beryl is sold to US Govt under an arrangement.. with the knowledge of the Prime Minister who is in charge of the DAE". NK Dravid, writing the reply, was the Joint Secretary to the DAE, AEC.

6.3 The Fuehrer in Atomic Energy

I shall end the episode with a letter from Saha written [24] to Nehru on 18 July 1955. Back from the Moscow conference, Saha wrote

it principally to report his experience there. With it, however, he appended a 7-page supplement in which he wrote :

"I cannot help remarking that the latest administrative measures taken (it must be the creation of the DAE in 1954, *Au*) apparently to improve administration have made Dr HJ Bhabha a Fuehrer in atomic energy development in this country as Heisenberg was made in 1944 in Germany. The analogy is almost complete and I have no doubt that it will lead to the same disastrous results.

"He is the Secretary of the Atomic Energy Department, Director of the Atomic Energy Establishment, and Director of the TIFR. Each one of this is a man's (and a very competent and gifted man he must be) whole-time job. There is too much concentration of power in one hand, and while conscious of power he behaves like a Fuhrer in his dealings towards us, the main work of atomic energy development is flagging. In the American AEC Act, there is a clause, that a man who is AE Commissioner, or Director of a laboratory under it, would be a whole-timer and would not be allowed to hold with it any other job."

Meghnad Saha did not live to see the first fruit of the AEC project. He died on 16 February, 1956. On 4 August that year, India's first Atomic Reactor, APSARA (a swimming pool type, that is, immersed in a water tank, whose fuel, which is enriched Uranium came from the UK, thanks to PMS Blackett) in Trombay went critical. It was a very simple device, constructed purely by Indian expertise, only to serve research purpose. It is said, Bhabha eventually followed the French Model. It is not clear if it is the same as the one proposed by Saha. The only similarity is in that it involves three phases. In the first phase, the operation is the same as outlined earlier leading to the requirement of separation of Pu-239 and U-238. In the second phase, both Pu-239 and Th-232 are used. Two neutrons should be available on the average per one Pu nucleus undergoing fission. One of the neutrons in the reactor breeds the fissile nucleus U-233 from Th-232. The other causes further fission of Pu-239. In the third phase, the fuel U-233 and the fertile Th-232 are used, the latter to contribute more of U-233.

Four years after APSARA went critical, CIRUS, a 40MW reactor of the same type and obtained from Canada through the Colombo Plan became operational. PURNIMA-2, a reactor from the third phase went critical on 10 May, 1984. The third phase reactor, DHRUVA producing 100MW was installed at Trombay still later. For power production we now have more than 5 nuclear power stations, falling far too short of the industrial and household requirement of the country. But thanks to Bhabha's endeavour and vitality, except for the fuel problem, India is now self-sufficient in the reactor expertise. Various processing plants for Th-232 and PU-239, heavy water plants (Nangal, for example) have been installed in the country. Saha, who wanted all of it realised much earlier, would have been happy to know that DHRUVA relied on Indian expertise alone. Perhaps Bhabha was sure of it eventually, but he too did not live to see much of his dream come true. He died in early 1966 in a plane-crash over Alps on his way to Geneva to attend an International Atomic Energy Conference. He died for Atomic Energy.

7. Conclusion

It is widely publicised that the Indian Atomic Energy Programme is born out of Bhabha's deep national feeling and a wise foresight. Seeing all, one may very well have to reconsider both. To someone who hardly knows his country and countrymen, national feeling is something that does not come naturally. To one who in his youth forbade traders hawking in the street he lived by, and who, in power, denied his countrymen access to the development of the country's nuclear programme, national feeling is at best a mythical construct thrust upon him. When Bhabha's entire move in respect of the Indian nuclear programme is carefully perused, chance is, it will look like pursuing more of a personal agenda than a national cause, and that too at the country's cost and welfare. Regarding Bhabha's vision, suffice it to say that nuclear electricity in India is a far cry even after sixty years of its inception. Meanwhile, Bhabha has to his credit, a great DAE Empire built in the country, with purposes always expressed in rhetorics and activities far from transparent.

Apparently, the only good thing that has come out of Bhabha's programme is that it has eventually set in an industrial age in the

country as a consequence. That might be taken as to reflect Bhabha's undeclared policy: Start something and it will automatically meet its own requirement. But there is one danger in this policy. It incurs wastage, and involves unusual delay in achieving the real objective. More often than not it ends in frustration.

The point that should be emphasised in all this is that a successful development of Atomic Energy in India not only depends on resources and facilities but also on sound policies from the Government and a clear understanding among the workers involved in it. Had the control over this particular research not been concentrated at one point and in one person wearing too many hats at a time, had there been no secrecy about the relevant plans and policies allowing efficient men of the land into confidence, the atomic energy development in India would have been much faster and spectacular. If we note the small time that passed between sending a team to France for training in pile technology and the first realisation of a reactor in the country it seems all the more true. And that is what Saha tried to harp on time and again.

Notes

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[2] Bhabha, HJ to Tata, JRD, 19 August 1943
[3] Bhabha, HJ to Saklatvala, Sir Sorab, 12 March 1944
[4] Bhabha, HJ to Chandrasekhar, S, 20 April 1944.
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[9] Bhabha, HJ to Sahni, B, 23 January 1944, Nat Arch India.
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[18] Saha, MN to Ghosh, JC, 9 April 1948, MSA.
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[21] Nuclear India 26/10/1989.
[22] Saha, MN to Bhabha, HJ, 3 April, 1948, MSA.
[23] Nucleonics, December, 1952.
[24] Saha, MN to Nehru, J, 11 November, 1953, MSA.
[25] Saha, MN to Nehru, J, 18 July, 1955, MSA.
[26] Sen, SN to Saha, MN, 23 December, 1947, MSA.
[27] JC Ghosh, SS Bhatnagar Files, 1952, MSA.
[28] Saha, MN to Nehru, J, 11 November, 1953, MSA.
[29] Patel, MS to Saha, MN, 3 November, 1954, MSA.

NON-RENEWABLE SOLID MINERAL RESOURCES ARE HEADING FOR EXHAUSTION WITHIN FORESEEABLE FUTURE – A REALITY OR MYTH: A CRITICAL APPRAISAL OF THE PRESENT STATUS AND FUTURE PERSPECTIVE OF THE MINERAL RESOURCES IN INDIA

ANUPENDU GUPTA

Introduction

The mineral resources are one of the most precious endowments of the earth, which have provided the foundation to every achievement of mankind since the dawn of civilization. Few people are fully aware of their daily dependence upon minerals, though they do not pass through a single day without using raw or manufactured materials which have been made from, processed by, fertilized with, or in some way or the other affected by minerals or mineral products.

The demand for mineral resources grows as mankind climbs the ladder of progress. The mineral resource of a country and the extent of its utilization are therefore important determinant of the growth and prosperity of a nation and its people. Though the value of mineral products accounts for a small percentage of GDP (2-4%) of a country, it plays a very significant role in world economy. The past hundred and fifty years have seen unprecedented advances in science, technology and industry. Such phenomenal progress has been possible due to the matching support provided by the metals and minerals – may it be industry, power, agriculture or the frontiers of scientific excellence on the earth or in space.

Are the mineral resources going to be exhausted soon?

A large section of the society including the media often express alarm regarding the exhaustion of the mineral resources in near future, in view of the facts that any asset which is non-renewable and being regularly consumed is bound to be depleted and ultimately get

exhausted sooner or later. Moreover, some of the mineral commodities are already scarce in the country and further depletion would certainly jeopardize our development. The possibility of unprecedented augmentation of expenditure on imports, as already faced by the nation on account of the shortage of fossil fuel (oil & gas) may be enhanced unless alternatives are seriously considered.

Though the above assessments and opinions should not be ignored, it would be also worthwhile to look into the subject from more realistic point of view. Firstly, in spite of the dooms day predictions, not a single mineral commodity has become extinct since mankind discovered and started utilising these over the past thousands or hundreds of years. It is true that catalyzed by the industrial revolution (1760-1840) and boost of machine-aided manufacturing, many minerals and metals like iron ore and base metals were mined and consumed in large bulk but exponential increase of the resource base by new discoveries over the years went largely unnoticed. Technological advancements in the field of mineral beneficiation and metal extraction outpaced the depletion of known resources. However, people at large felt threatened due to the stoppage of many erstwhile thriving mining camps in all corners of the world, though such closures were mostly due to economic considerations rather than exhaustion of ores. Besides, legends of huge resource of precious metals (gold, silver) and gem stones (diamond, ruby, emerald) in some countries (like India) in the past, to which there is little clue in the modern era, created further fear of approaching dooms day.

In an international geological congress held in Stockholm in 1910, it was declared that in 60 years there will be no ores left in the mines leading to utter shortage of iron ore and other important metals in the world. Even to the extent that an iron nail will cost worth gold of its weight. This prediction was based on an analysis of existing ore reserves and rate of exploitation in 73 countries. In the Brussels IGC in 1922, again the same opinion was voiced, although there was continuous flow of new discoveries and adoption of better technology leading to ever increasing economic utilization of leaner ores. Over a span of nearly 100 years from then the predictions have fallen flat and the world's mineral resource base has strengthened many times.

However, it is a continued practice to assess the life expectancy of important mineral commodities from time to time but none of these predictions hold ground for a longer time. The reasons are many and very lucid for the understanding of even laymen.

Till quite late in the history only the mineral occurrences and deposits within shallow depths located in the 'old world' were known. New discoveries in Africa, Latin America, South and South-east Asia, USSR-China-Mongolia and the Pacific islands vastly enhanced the resource base. Huge resource of fossil fuel (Petroleum) found in the Middle East/ Gulf countries changed the global scenario. Utilization of the theretofore 'low grade' ores and new materials as ores brought in a sea change. For example, 5-10% Cu in copper ore was considered economic before floatation process and Bessemer converter came into use, making the waste with much lower tenor into ore. Much inferior iron stones were used for iron & steel making while the use of hematite and magnetite, the principal ores of today, were not in use. Similar improvements took place in case of most other minerals when new ores were discovered or yesterdays waste became today's ore. Another major example is that of aluminium. Up to the mid - 19th century bauxite was not considered as an ore of aluminium. What we call aluminium industry today was non-existent till the electrolytic process of aluminium making was invented. Stretching our imaginations in the line of famous novel 'The war of the worlds' by H. G. Wells, one day with further technological innovation common clay that contains quite a good proportion of aluminium, may also turn into an ore.

Starting with merely 8 known metals in the Roman period, chemists had identified about 20 metals towards the end of 18th century. When a Russian chemist Dimitri Mendeleev came out with his Periodic Table in 1869, there were about 50 of them. Today, about 88 'certain' metals out of 118 known elements are there. So, our knowledge about the nature's bounty in the thin crust (30-50 km thickness) of the earth is growing with time and the spectrum and scope of their utilization is also expanding. Many new alloys have been discovered and put to industrial use, specially in high speed and cryogenic machinery as also in aviation and rockets. R & D in the field of ceramics made of non-metals has ushered a new era in economic utilization of mineral

resources. Being in a nuclear age the legend of alchemists in some cases may not remain in the realms of myth.

Most of the solid mineral resources are at present mined out from a few hundred meters depth in the earth's crust. Giant deposits have recently been located at greater depths and 'digging deep' based on metallogenic concepts is an ongoing endeavour across the world.

Substitution of minerals and metals by synthetic products is another area of innovation in material science. An Indian example will be a case in point. Till a few decades back there were numerous mica mines in Kodarma-Giridhi-Hazaribagh region of Bihar mica belt (now in Jharkhand). Mica was widely used in electrical and other appliances and India was the topmost producer and exporter of sheet mica (muscovite) in the world. After the discovery of synthetic substances suitable for the purpose, the market of sheet mica declined and mica mining dwindled within a short time. But there was no shortage or exhaustion of mica bearing pegmatites, the discontinuation of a thriving industry was simply because of substitution. From a wider view point this was certainly welcome. It will be all the more welcome if in future renewable energy reduces or replaces the use of thermal coal or fossil fuel.

But whatever may be the reasons, closure of thriving mining and ancillary industries, to cite a few examples, like mica mines of Kodarma, copper mine of Mosabani, Kolar gold mines and Kudremukh iron mine, Karnataka leaves a deep negative public impression and scare for exhaustion of mineral resources. Media and poorly informed activists often escalate the feeling of looming threat.

Looking at the future scenario of mineral wealth we cannot overlook the vast potential of the off-shore territories. Besides off-shore fossil oil and gas reserves we are also aware of the presence of very large resource of manganese nodule associated with other important metals in deep sea, and the near-shore REE & RM bearing placers. Gas hydrates discovered close to shelf opens new vistas of energy resource in future. Recent discovery of substantial resource of Shale Gas in the United States is a path finder for similar potential elsewhere including India. The sea water, which contains great quantities of dissolved Ca, Na, Fe, Al etc., is in itself a potential source for many useful materials.

In future, potable water may also be obtained on commercial scale by purifying the sea water. We are just waiting for technological breakthroughs and of economic viability.

Present status of solid mineral resources in the country

After a brief assessment of the mineral resource security of the world with a broad brush let us now examine the issues in Indian context in order to evaluate the situation more critically and to arrive at a pragmatic view.

Before going into the facts and figures let us look at the geographical and geological frame of the country.

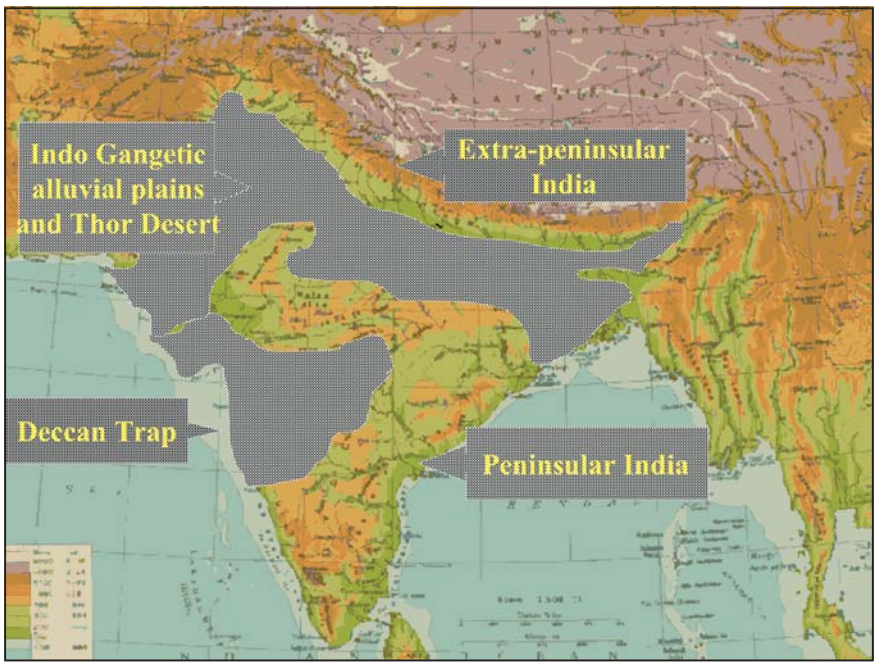

Figure 1 : Geographical setting of Indian landmass

The Fig.1 above shows three major geographical entities of the sub-continent – the mountainous tract of Himalaya in the north, Indo-Gangetic alluvial tract along south of Himalaya and the peninsular region in further south. Besides, there are Andaman & Nicober Islands in the Bay of Bengal and Lakshadweep cluster if islands in the Arabian sea.

Geological frame and distribution of minerals in India

The geological map of India presented in Fig. 2 shows the geological elements of the peninsular India (Indian Precambrian shield), dominated by Precambrian rocks with remnants of Archean cratonic blocks (>2.5 Ga) of Dharwar, Bastar, Singhbhum, Bundelkhand-Aravalli and the associated Proterozoic (<2.5 Ga) belts. The Eastern Ghats Mobile Belt (EGMB) skirts the shield along its east, evolved through episodic crustal reactivation from mid-Archean to late Proterozoic. The younger geological history of Paleozoic-Tertiary time with the basement and tectonic slices of Precambrian rocks is recorded along the Himalayan belt. A large part of peninsular India (~65.000 sq. km) is covered by the Mesozoic continental flood basalts known as Deccan Trap. Early to late Proterozoic continental cover sediments (Cuddapah, Chhattisgarh, Indravati basins etc.) and coal bearing Paleozoic Gondwana sediments in elongated terrestrial basins and grabens (Damodar-Barakar, Mahanadi, Godavari, etc.) overlie the older rocks in peninsular India. The coastal tracts mostly record the deposition of Tertiary-Quaternary sediments, besides Mesozoic rocks in Cutch, Gujarat. The NE India has a detached segment of meso-late Proterozoic granite-gneisses massif in Meghalaya and the Tertiary meta-sediments and volcanics in further east. The E-W trending alluvial tract with very thick pile of Quaternary sediments of Indus-Ganga-Brahmaputra valleys lies between Himalayan belt in the north and the southern peninsular India, and extends from the western extremity of the country to the east and south-east up to Bangladesh border and Bengal basin and Gangetic delta.

No country is endowed with the resources of all known minerals in substantial quantities due to the natural polarity of the crust, and India is no exception. The Archean-Proterozoic rocks of peninsular India are the main repository of metallic (Non-ferrous, Ferrous, Precious) and non-metallic minerals in different geological environments. Substantial resource of coal & lignite is housed in Gondwana and Tertiary sediments. Phosphorite, magnesite and some base metal deposits are known from the Himalaya. Potash of low grade is immense in the evaporate basin of western India. The northward sojourn of the Indian Plate into the tropics in Tertiary resulted in the formation of immense residual deposits of bauxite and

monazite sand (with several other mineral placers) by the weathering of older rocks. A part of the supergene hematitic iron ores and lateritic manganese ores were formed during this period.

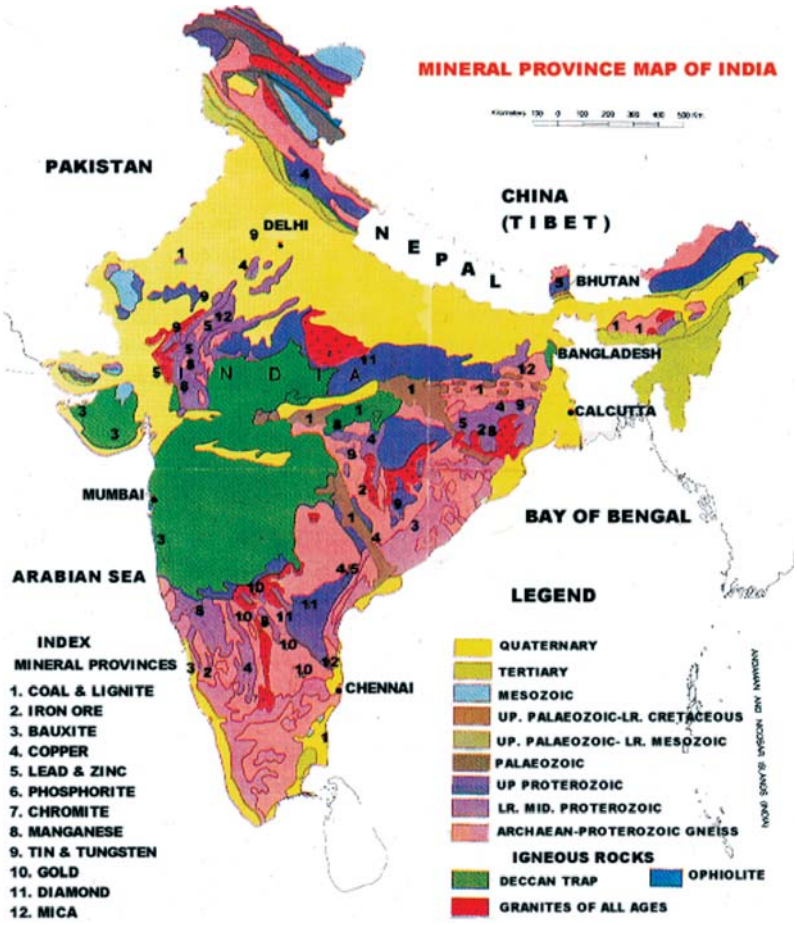

Figure 2 : Mineral Province map of India

Discovery and utilization of minerals in India

The discoveries and utilization of minerals & metals on limited scale started in the sub-continent from prehistoric time and continued more or less as cottage and small scale industries for thousands of years. Unfortunately a more complete story of these achievements, even of the medieval and early modern period, is lost due to the scarcity of written records, except for the fairly good accounts of

some major mining activities like Kolar gold, Mosabani-Rakha copper, Golkunda (Kollur) and Panna diamond, Zawar zinc, Raniganj-Jharia coal etc. Besides the evidence of major mining and metallurgical achievements in the past, the country is dotted with innumerable old workings, mine dumps and slag heaps bearing the mute testimony of ancient and old use of minerals. These foot prints guided the prospectors and geologists of all later generations.

The first attempt for systematic documentation of the geology and distribution of mineral deposits in the country was initiated in the British period (mid-19th century onwards) with the establishment of the Geological Survey of India in 1851. The initial emphasis was on locating and assessing coal resources to meet the growing needs of the railways. Collation and synthesis of preliminary geological information gathered from various parts of the country from 18th century onwards by the East India Company's officials, travelers and some naturalists was also initiated. To begin with all the geologists in GSI were Europeans, followed by slow induction of the Indians. In the pre-Independence era GSI and geological departments of some princely states started geological mapping on 4 inches: 1 mile and 1 inch: 1 mile scale and prospecting for minerals. Besides mining of coal in the Raniganj-Jharia coalfield, eastern India, copper mining was started in Mosabani and Rakha Mines in Singhbhum, Gold mining was revived in Kolar Gold Field, mica mining was started in Bihar Mica Belt (now Jharkhand) and mining for Pb-Zn ore was invigorated in Zawar, Rajasthan. Courtesy an Indian geologist, Mr. P. N. Bose, major hematitic iron ore deposits were located in northern Orissa and Bihar, which lead to the erection of the first steel plant of India at Jamshedpur by the TISCO (now called Tata Steel).

Post-Independence Era

Significant achievements

Soon after the Independence, need for fast tract industrialization was duly appreciated by the builders of the nation and an all out effort was initiated for mineral development in order to provide material base for such endeavour. The memories of World Wars were still fresh and highest emphasis was laid on self-reliance in all important sectors and

judicious conservation and utilization of the natural resources of the country. Many new mineral deposits were discovered after Independence, a few important ones are depicted in Figure 3.

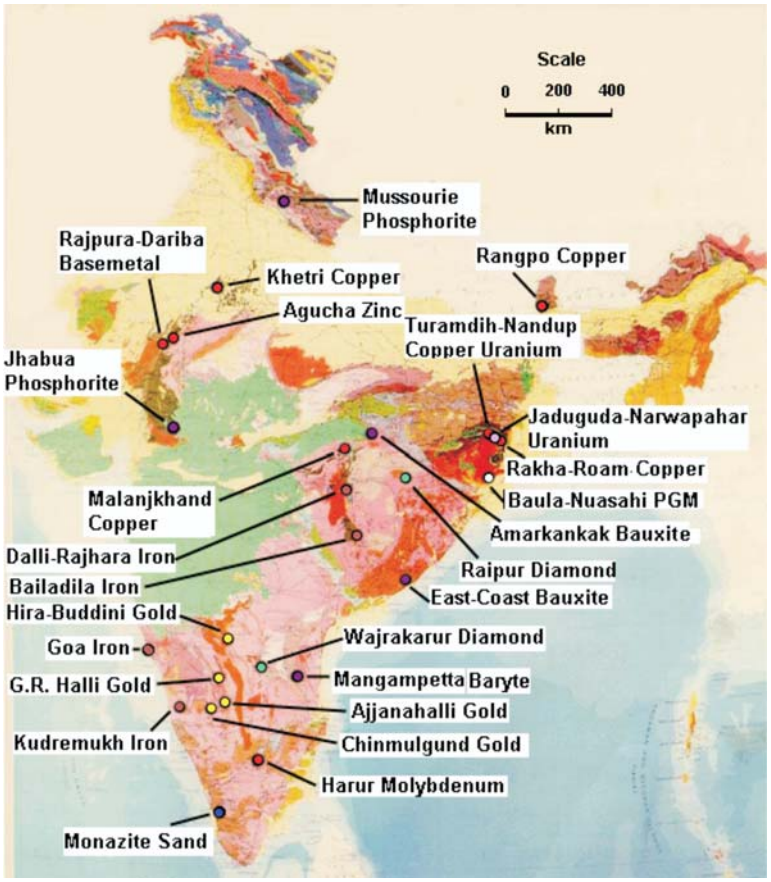

Figure 3 : Some important mineral deposits established in post-Independent India

Since Independence there were sustained efforts in consolidating the resource base leading to the massive progress in the industrialization and modernization witnessed over the last seven decades. The outcome is evident from the comparative figures of mineral commodity wise resource position from 1955 to 2010 (Table-1), and the rise in production from 1948 to 2015 (Table-2).

The mineral base of the country has increased from 34 to nearly 90 mineral commodities of which 4 are fuel minerals, 10 metallic, 50 non-metallic, 3 atomic minerals and 23 minor minerals (building and other materials). The quantum of annual production was also increased significantly. Resources and production of coal & lignite, which support more than 70% of country's energy need, have been satisfactorily escalated. Same is true with iron ore, bauxite, barites, chromite, etc. While there has been self sufficiency in respect of many important minerals, some having exportable surplus, deficiency continues for several other commodities (Table: 3). A list of minerals which rank high in the world in terms of annual production is presented in Table 4.

The mineral wealth of the country provided adequate support to the basic industries like thermal power, steel, ferro-alloys, aluminium, cement, refractories, glass & ceramics, agriculture, foundries, abrasives, paints and broad spectrum of inorganic chemicals. There is, however, a very significant resource gap in respect of some minerals/elements for which we are partly or largely dependent on imports. A few of these are not yet known to occur in economic proportion and grade such as PGE, REE, tin, antimony, cobalt, nickel and some rare metals (RM) used in high technology. Some important commodities that occur as associated elements with major metal ores also partially fulfill our requirement.

The consolidation of mineral base was particularly phenomenal during the 5th and 6th Plan period (1974-79 and 1980-85), when world class deposits of bauxite were discovered putting India in a place of pride, the resources of barites, chromite, manganese, tungsten were augmented by six to nine times and reserves of some other ore minerals like those of copper, lead-zinc, etc., were increased by two to three times. With the revival of attention on solid fuel minerals in early seventies (after oil crisis of 1973), there was phenomenal enhancement of coal and lignite resources in the country. From the 8th plan (1993-97) onwards greater emphasis was laid on minerals like gold, diamond, molybdenum, PGM, Rare Earths and Rare Metals, leading to the discovery of new diamond and gold fields and identification of small deposits of molybdenum, PGM and cesium (Cs), which were not known earlier.

Slow-down and actions for turn-around

Slow down of progress was faced from 7th Plan period (1985-'90) at many fronts including mineral sector. Soon afterwards the

country adopted new economic order (1992) and new Mineral Policy (1993), followed by a series of new Acts (MMRD Act, 1957 amended as MMDR Act, 1993, 1999, 2015) and new Regulations & Rules to promote mineral development in liberalized regime. The Mineral Policy was revised in 2008 and another revision is under way in 2018. Because of the new policies and regulations the deficiencies in the mineral sector were soon met to some extent through imports. However, the end of economic protectionism ushered in a regime of market economy in almost all spheres including the mineral sector. The old ideals held by the country since Independence were soon left behind. The worst affected areas were the concept of conservation of resources, aspirations for self reliance, especially in respect of strategic minerals, use of indigenous raw material in preference to the imported materials and so on. However, slowly but definitely it is realized now that to look for more and more indigenous resources to reduce the financial load on imports is essential and the nation must strive for self reliance to the extent possible. Side by side commercially viable use of renewable energy sources like solar energy, wind energy etc. are equally important for the future. It may be accepted now in most quarters without much debate that nuclear energy cannot provide major energy security in future because of uncontrollable hazard potential.

Large expansion is under way in bauxite mining and aluminium production in spite of severe environmental restrictions. Iron ore production faced serious hindrance due to the ban imposed on exports by the Supreme Court. Posco's mega-project of iron & steel in Orissa is also facing major roadblocks. Sizeable expansion in zinc ore production is in the offing. The Pebble Creek Resources Ltd. of Canada has applied for mining lease for a massive sulphide deposit of 1.7 Mt with Cu 2.53% , Zn 6.07%, and Pb 3.85% at Askot, Uttaranchal, which holds a potential of 10-20 Mt. It is held up for environmental clearance. The newly formed Platinum Mining Corp. of India has taken up detailed evaluation of Baula-Nuasahi prospect in Orissa where a reserve of 14.2 Mt with a combined platinum and palladium grade of 1.5 g/t was estimated by GSI-BRGM under cut-off grade of 0.5 g/t. The development of Bhukia gold in Rajasthan and Banda diamond deposit, UP, is held up due to non-conducive mineral policy.

In spite of the fluctuations in our progress in consolidating the mineral wealth, the country is more or less well placed, though not fully satisfactory in respect of all the needs. There is no indication of exhaustion of the existing mineral base of the country in foreseeable future. The USGS document on the Mineral Industry of India - 2005 records that India is endowed with a variety of mineral resources and the mineral industry constituted an important sector of the Indian economy. The mineral industry produced metal and a large amount of industrial minerals and was characterized by many small-scale mining operations.

However, it is an express need to find out the deep seated mineral deposits by concept based search and also to acquire the technological capability of utilising low grade ores.

In the context of our ongoing efforts for locating deep seated deposits let us have a look at the discoveries of a few deep seated giant ore deposits and case histories of exploration success during recent past in various parts of the world, before discussing the Greenfield potentials in the country.

Major discoveries of deep seated mineral deposits across the world

Olympic Dam deposit, Southern Australia

Most spectacular case history of concept based prospecting by applying theoretical modelling was that of Olympic Dam deposit in Southern Australia. Though the area showed no mineralized outcrops of any kind, geological and geophysical prognosis led to the idea that the host volcanic rock, some 350 meters under a bed of post mineralization sedimentary cover, might contain valuable and economic mineralization. The entire project was a giant gamble by the Western Mining Company because they were drilling strictly based on little more than indirect information. The exploration efforts resulted in the discovery of a giant deposit of 2.6 billion tons of ore grading 1.2% copper and 0.5 g/ton gold with associated uranium in economic numbers. That makes Olympic Dam some 10 to 20 times bigger than most world class ore bodies.

A new model, called IOCG for Iron Oxide-Copper-Gold, was formed based on the Olympic Dam discovery. Based on this concept

several deep seated IOCG type deposits were located in different countries.

Voisey's Bay Ni-Cu deposit, Labrador, Canada

The Voisey's Bay Ni-Cu deposit in Labrador is one of the most significant discoveries made in Canada in recent years. This was a virgin area, where some interesting magnetic and electromagnetic anomalies were delineated by airborne surveys, but no definite exploration target could be identified for many years in spite of reconnaissance done by a number of prospecting agencies. During 1993-94, a gossan was discovered on a hilltop, grab samples from outcrop analyzed 2% Ni, 0.5% Cu and 0.12% Co. Out of 5 boreholes drilled one hole intersected a 71.0 m zone that graded 2.23% Ni, 1.47% Cu, and 0.12% Co. It was very encouraging but far from a major discovery as the outcrop was of limited dimension.

Systematic drilling programme was conducted in 1995 established 31.7 million tonnes of ore grading 2.83% Ni, 1.68% Cu, and 0.12% Co. The deposit was found to be associated with two 1334 Ma troctolite intrusive chambers, connected by a 10 to 100 m wide dyke. Reserves and resources as of 2005 were 32 million tonnes (Mt) of proven and probable reserve grading 2.75 % Ni, 1.59 % Cu, and 0.14 % Co; 40 Mt of indicated resource grading 1.89 % Ni, 1.90 % Cu, and 0.12 % Co; and 6 Mt of inferred resource grading 1.9 % Ni, 1.0 % Cu, and 0.2 % Co.

The success at Voisey's Bay led to a huge surge in exploration in this part of Labrador in 1995 onwards and many new Ni-bearing occurrences were located and explored.

Noves Corvo polymetallic deposit, Portugal

The Noves Corvo was selected as a target area for exploration because of its location in the western extension of the Iberian pyrite belt falling in Portuguese sector. A 0.5 m Gal Bouguer Gravity anomaly along the belt and follow-up geophysical surveys including magnetic, resistivity and other electrical methods could not clearly define the expected ore body at depth. A bore hole drilled up to 244 m depth passed through volcanic units and monotonous flysch type meta-sediments but did not intersect any sulphide bearing zone. However, collection and synthesis of geochemical, geophysical and geological

data including lithostratigraphic, paleogeographic and tectonic studies were continued and ultimately a deeper borehole drilled at the same spot in 1977 discovered a 50 m thick high quality ore body at 350-400 m vertical depth. What was most pertinent and impressive at Neves Corvo was an almost decade long persistence in the application of geological knowledge and insistence that all data should make geological sense. The fortuitous bonanza discovered here, leading to the location of a World Class polymetallic deposit was rather a vindication of the conceptual approach to mineral exploration equipped with metallogenic theory and consequent prediction.

Kilembe Cu-Co sulphide deposit, Uganda

This case history, though quite old, is still considered relevant because many a times an ingrained concept holds back the exploration geologist from looking beyond the 'obvious'. The Cu-Co sulphide mineralization of limited extension at Kilembe was considered to be shear controlled and genetically related to the Alaskan pegmatites exposed in the vicinity. Mining was going to be terminated as the deposit was small, economically marginal. Apparently it did not hold much prospect for reserve augmentation with the belief of its genetic type.

A breakthrough came at this juncture by theorising an alternative genetic model and testing it by renewed surface studies in the surrounding area and drilling. It led to the finding of strongly deformed layered pyrite bands in the metamorphic country rock, followed soon by the discovery of pre-shearing layered Cu-Co ore bodies extending for several kilometres. By pursuing the same model in regional prospecting, Kilembe-style mineralization was identified for 30 km westward. The case history of Kilembe provides an example of the value of testing more than one concept of ore formation, specially in cases where extensions to known deposits are difficult to find.

San Nicolás massive sulphide (VMS) deposit, Central Mexico

The San Nicolás volcanogenic massive sulphide (VMS) deposit in central Mexico is located approximately 60 km ESE of the city of Zacatecas. The deposit consists of an upper Main zone of massive

sulphide with estimated reserves of 72 Mt at 1.35% Cu, 2.27% Zn, 0.53 g/t Au and 30 g/t Ag, and a copper-rich Lower zone containing a resource of 11.4 Mt grading 1.62% Cu and 0.48% Zn.

Exploration in the San Nicolás area from 1982 until 1995 was directed towards epithermal silver-gold targets only. In course of renewed exploration by at El Salvador property in 1996, drilling revealed a small zone of massive sulphide mineralization (2.07%Cu, 1.53% Pb, 16.57% Zn, 3.68 g/t Au and 213 g/t Ag) of possibly of VMS origin hosted by siliceous sedimentary rocks at the contact between underlying felsic tuffs and breccias and overlying porphyrtic andesite. This revelation in a small area prompted total reorientation of the exploration strategy, launching an all out effort for locating the main VMS ore body at depth. Renewed geological mapping and reinterpretation, related sampling, airborne magnetic-electromagnetic-radiometric surveys were carried out leading to the identification of prospective volcanic sequences of extensive dimension. Ultimately, by mid-1998, the San Nicolás deposit was delineated by 58 drill holes and preliminary reserve figures were announced later that year.

The Main zone of massive polymetallic sulphide at San Nicolás forms a keel-shaped lens up to 280 m thick, 900 m long and 200-400 m wide. The Lower zone is a tabular chalcopyrite-rich body, which appears to join the southeast part of the Main zone at a depth of approximately 400-450 m below surface. The top of the massive sulphide lies 150-220 m below the surface and is covered by up to 100 m of un-mineralized mafic volcanic flows, fragmental rocks, and volcaniclastic and argillaceous sedimentary rocks of Upper Jurassic-Lower Cretaceous age. These rocks are in turn covered by 50-150 m of Tertiary volcaniclastic breccias.

The discovery of the San Nicolás VMS deposit resulted from two main factors:

- ❒ The early realization that mineralization in the El Salvador area might have a VMS origin and refusal to accept the local dogma – that VMS mineralization did not exist in the area.
- ❒ The adaptation of exploration techniques to suite the local environment and provide effective coverage of the property.

Oyu Tolgoi porphyry gold and copper deposit, south Gobi, Mongolia

The last decade and half has witnessed great discoveries of Cu-Mo, Sn-W, Pb-Zn and Cu-Au deposits in Mongolia. After the discovery of the giant mid-Paleozoic Oyu Tolgoi (Turquoise Hill) porphyry gold and copper system in south Gobi region of Mongolia there have been a series of discoveries and development of porphyry-type deposits in this region, viz. Kharmagtai, Shuteen, Ovot Ovoo, Oyut Ulaan, Chandam Uui. Most of these deposits fall in the South Gobi Basin, along the south of which passes the eastern extension of the Tien Shan metallogenic belt.

In some of the porphyry deposits, the mineralization crops out, whereas in places like Hugo zone in northern parts of Oyu Tolgoi, the porphyry system is deeply buried. The largest Cu-Mo deposit in this belt is at Erdenetiin Ovoo (Erdenet mine) with total resource of 178 Mt ore, grading 0.62% Cu and 0.025% Mo. Kharmagtai is another large deposit where a resource of 193 Mt with 0.25% Cu was estimated. The history of mineral prospecting in Mongolia in modern times dates back to the period 1960-1980, though most of the major discoveries were in mid 1990s onwards. It is a testimony of perseverance and application of latest techniques in mineral search over a long period.

A few more examples of concept based major discoveries :

1. Cannington Ag-Pb-Zn deposit, Mount Isa Eastern Succession, Australia, with defined resource (1995) of 43.8 Mt grading 11.6% Pb, 4.4% Zn, 538 ppm Ag. The deposit is hosted by amphibolite facies migmatitic quartzo-feldspathic gneiss sequence, displaying Broken Hill-type affinity.
2. Century Zn-Pb-Ag deposit, North-western Queensland, Australia. The latest resource estimate of this world class deposit is 167.5 Mt, grading 8.2% Zn, 1.2% Pb and 33 g/t Ag. The mineralization is in unmetamorphosed black shales, alternating with siderite rich layers of Middle Proterozoic. This major deposit was lying undetected below a thick post-mineralization cover in a 20 km-diameter cluster of small quartz-siderite-galena-sphalerite veins, which were explored and mined over last hundred years.
3. The Kansanshi Cu (-Au) deposit, located at about 160 km west of the Zambian copper belt was recently estimated to contain 267

Mt ore grading 1.28% Cu and 0.16 g/t Au. The deposit is hosted within Late Proterozoic sediments and the mineralization event is dated ~500 Ma. The near surface shows of this deposit have been worked out since ancient times followed by underground and open pit mining until their closure in 1998.

The potential of a major resource in the area is credited to an exploration company who took over the project in 1997 and reinterpreted old drill hole and soil geochemical data, followed by extensive drilling and complete revision of geological model. The identification of the major deposit was primarily through drilling and geological observations and interpretations.

4. The Gold strike property, located in the Carlin Trend in Nevada, USA, includes diverse groups of Carlin-type deposits with some of the largest and highest grade examples. Though gold deposit was known at Gold strike since 1962, it was only in 1986 when the very large ore bodies with high grade were discovered 200 m beneath the smaller low grade ore bodies. This was an outcome of continuous exploration over forty years relying on the evolution of geological understanding of ore controls, supported by application of geochemical and geophysical exploration techniques. Today, a total endowment of 1970 t gold has been estimated for this property. The exploration history of Goldstrike provides an example of success achieved through exploration persistence with the evolving theoretical back-up in a Brownfield venture.

Potential for undiscovered mineral resources - Indian perspective.

Brownfield Areas

1. Dharwar craton may be re-examined for locating greenstone related orogenic gold at deeper levels of the numerous schist belts.
2. The Wynad-Nilambur Gold Field, Kerala also merits a concerted effort to locate deep seated gold deposit.
3. India is the only country in the world which in spite of having vast Precambrian shield area does not have any nickel mining history. It may need a nation wide campaign to look for both primary nickel and PGE in favourable domains.

4. The Southern Granulite Terrain (SGT) should not be neglected for mineral search. Broken Hill Pb-Zn deposit in Australia, Renco gold deposit in Limpopo belt, Zimbabwe, gold in the high grade terrain of North China craton are some prominent examples. There are some Indian examples of small prospects of Zn-Cu-Pb in Mamandur, Tamilnadu and Attapadi gold in Kerala.
5. Serious research is needed to identify IOCG type metallogeny in India, which may provide vast opportunities for locating new deposits at depth. The Cu-Au-U belts of north Rajasthan, Singhbhum and some areas in Chhattisgarh might merit a close scrutiny. Presence of mafic volcanics, high content of magnetite, profuse albitization (soda influx), hydrothermal hematitic breccias etc. may be considered together as a prima facie.
6. As hematitic iron ore is no longer considered as the sole product of supergene process, it would be prudent to explore at depths beyond conventional limits to locate hydrothermally enriched ore horizons.
7. In the peninsular India, there are many crustal domains where concerted efforts should be directed for the location of Precambrian porphyry copper type deposits. The Malanjkhand Granite being equivalent in age to the much larger expanse of the Dongargarh Granite, the latter may form the immediate target for the search.
8. East Indian craton may be searched for locating diamond bearing Kimberlite-lamproite.

Greenfield areas

Three important Greenfield (virgin) areas which deserve a close look by the exploring agencies as collaborative efforts and adequate governmental support:

Deccan Trap covered region

About half a million square kilometres of west-central part of peninsular India is covered by the largely Mesozoic continental flood basalts known as Deccan Traps. The original spread of this extensive Phanerozoic volcanic suite could be much larger than the present extent, as obvious from its scattered surface and sub-surface occurrences both on-land and in the off-shore regions around the

peninsula. It is quite apparent that the northern extension of Dharwar craton and the western continuity of Bastar craton, both being repository of many metalliferous deposits, are covered by the thick volcanic pile of Deccan Trap.

The Deccan Trap covered terrain remains almost entirely unexplored. There is no database in regard to the possible existence of mineral deposits in the basement or in respect of probable metallogeny related to the volcanism or hydrothermal activities in this vast terrain. It does not need overemphasis to consider this region as an appropriate Greenfield for launching massive search for minerals. The oil companies have conducted extensive geophysical investigations to locate favourable structures in Mesozoic sediments underlying the Trap (and also some drilling), but no effort was directed towards prognostication of metalliferous deposits. Other than the possibility of locating mineralized tracts in the Precambrian basement rocks, there are two broad possibilities of metallization within the Deccan volcanics, i.e. 1) magmatic sulphide and 2) hydrothermal mineralization. Situation similar to Noril'sk-Talnakh Ni-Cu sulphide deposits in Siberia, where ore accumulation has taken place at the interface of the continental basalt with the underlying Permo-Triassic sediments is a distinct possibility.

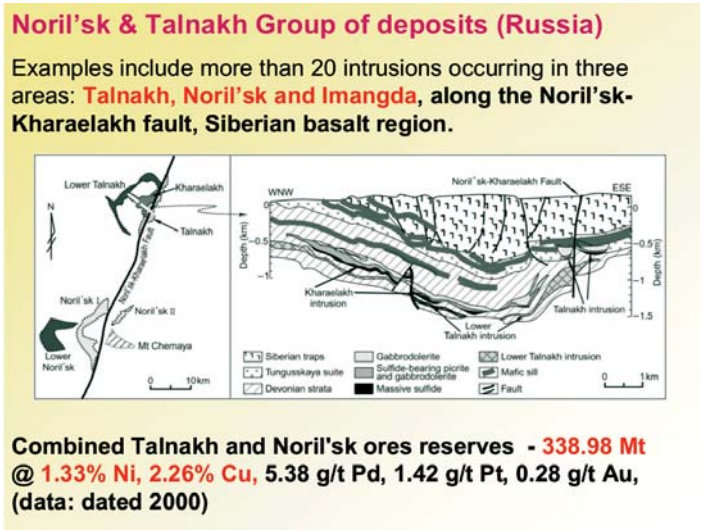

Figure 4 : Noril'sk-Talnakh giant Ni-Cu deposits, Russia

Bundelkhand granite-gneiss complex

It was observed that the Pearl Lake Porphyry, McIntyre Mine, Canada, "demonstrates not only porphyry copper deposits formed during early Precambrian time, but that the level of erosion has not been as great as to remove these deposits". This discovery opened up new avenues for the geologists to look for porphyry-type deposits in the Precambrians, which till 1971 were considered almost by definition to be confined to Late Mesozoic-Tertiary rocks occurring in Island arc setting. Since then many more Precambrian porphyry deposits from Australia, Finland, Canada, China, Sweden and many other countries have been added to the list. The Malanjkhand Cu-deposit in M.P., India was recognised as one of the largest of this type much later than its discovery (Sikka, 1989; Steins et al.), though the uppermost stock-work zone seems absent according to the later researchers (Sarkar and Gupta,2010).

Could the vast Bundelkhand granitoid complex host porphyry sulphide or shear controlled hydrothermal mineralization remains a moot question of great relevance.

The general characteristics of the Precambrian porphyry deposits are 1) association with calc alkaline/ alkaline magma in subduction zones, 2) typical presence of I-type syn-kinematic granitoids as host rocks, 3) association with high level porphyrtic intrusives along faults and shears, 4) weak to strong hydrothermal alteration (kaolinite, sericite, propylitic, phyllic etc.), 5) development of enriched oxidation zones in some cases, and 6) mineralogical zoning of the ore body. At least three of the above criteria are satisfied by the Bundelkhand complex and age-wise also it matches with one of the global age clusters of Precambrian porphyry deposits (2500-2800 Ma) including the Malanjkhand deposit (2500 Ma). As such, there is hardly any reason for ruling out the Bundelkhand granitoid complex as a prospective repository of porphyry-type sulphide mineralization. Evidence of hydrothermal activity is spread over the entire terrain as prominent linear zones of clayey alteration comprising pyrophyllite, diaspore, sericite, chlorite and kaolin. There is also the evidence of oxidation in form of ferruginous zones within the granitoid complex. Occurrences of pyrite, chalcopyrite, galena and molybdenite are

reported from a number of places, sometimes in close proximity of quartz reefs and zones with pyrophyllite-diaspore mineralization.

So far the mineral prospecting efforts in this region have been mainly directed towards assessing the mineralized volcanisedimentary enclaves of older supracrustals and the sporadic vein quartz hosted mineralization within the granitoid complex. Concept oriented deeper probe should be a priority task in this region.

Himalaya

It is rather intriguing that the most impressive mountain range on the face of the earth has such a dismal record of metallogeny and should consequently stand written-off as a non-potential crustal segment. Both from the view point of plate tectonic status of this continent-continent collision zone and its comparison with Alpine belt, it is difficult to believe that all the possible negative factors could conjure in an unique manner to make the Himalaya barren of any significant metal accumulation. It will be regarded as a freak of nature even if theoretical explanations are presented to justify insignificant metallization in all segments of Himalaya ranging in age from Proterozoic to Tertiary. Therefore, with an optimistic outlook, the Himalaya deserves a thorough scanning for possible but varied metallogeny ranging from sedimentary-digenetic types in the Frontal belt, SEDEX type and hydrothermal deposits in Lesser Himalaya, Tertiary granitic pluton related metallization in Central crystalline, bedded deposits in Tethyan sediments, ophiolite related metallization along Indus-Tsangpo suture zone and porphyry type deposits in Trans-Himalayan region. The hot spring system of Puga valley, Ladakh, perhaps presents evidence of a live epithermal process at depth. There are many prominent hydrothermal alteration zones with or without mineral shows which may also lead to metal concentration in deeper levels.

Mitchel and Garson (1981) assigned several tectonic elements in a collision zone as depicted in the following cartoon. The zone of our interest in this cartoon is the Foreland (under-thrusting Indian Plate), which shows the inherited Precambrian Pb-Zn-Ag deposits, syn-collisional Tertiary Fe-Ti anorthosite and Sn-W skarns in granite

plutons. More commonly an island arc forms on the overriding Hinterland (which is beyond Indian territory) with much greater metallogenic potential.

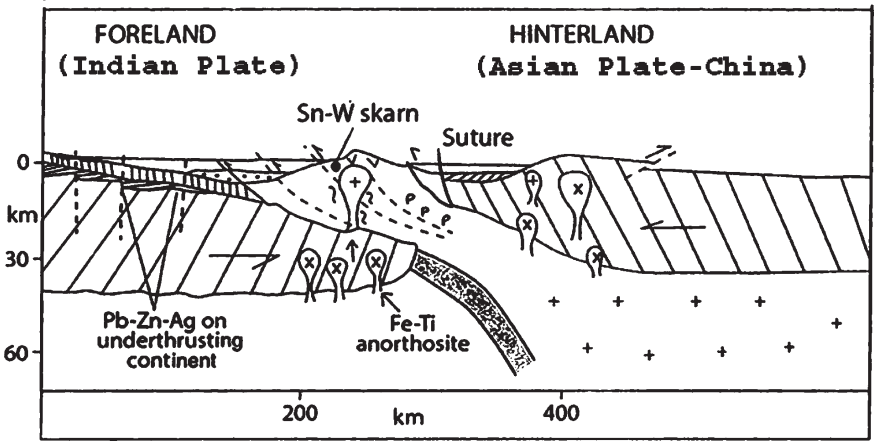

Figure 5 : Cartoon of foreland-hinterland in collisional setting with locations of some deposits (Michel and Garsen 1981), from Deb and Sarkar, 2017

The recent discoveries of Qulong/Yulong and Jiama giant porphyry Cu-Mo (1430 Mt) and Cu-Mo-Ag (1054 Mt) deposits in Miocene Gandese in Tibet have removed the earlier impression that the Himalayan belt was largely sterile. It is opined the aforesaid deposits are related to post-collisional magmatism. But unfortunately none of these discoveries are in the Indian segment of the Himalayan collision zone.

However, it is held by the researchers that the under plating and thrusting are never along one plane but are spread over several smaller thrusts in the collision zone, thereby opening up the scope of multiple loci of metallization over a much wider zone.

Although PGE and podiform chromite mineralization are reported from Indus-Tsangpo suture zone, the preliminary data are not very encouraging. Nevertheless, it is highly potential for ophiolitic Cyprus type Cu-deposit. The Trans-Himalayan tonalitic granitoids in the Ladakh belt are potential rocks for the discovery of porphyry copper mineralization, but none has been discovered to date within Indian territory. We have a serious task ahead.

Future scenario of mineral resource strength of India

The above clues in regard to the cited Brownfield localities and the three Greenfield segments of Indian sub-continent, with whatever merit they hold, deserve serious pursuance by professional groups comprising corporate, governmental and academic experts on a long term basis. A national campaign, similar to those launched by Natural Resources Canada (NRCAN) and Geological Survey of Canada (GSC), resulted in many new discoveries including the ushering of Canada in the diamond map of the world. Targeted Geoscience Initiative (TGI), a current endeavour of the GSC, is aimed at integration of industry and government data collected over the years to conjure up new images of old camps with the hope of discovering previously undetected ore. We need such initiatives in India.

It may be reiterated that the country is more or less comfortable in regard to many important mineral commodities but the search for more has to continue with all seriousness. For the ease of exploitation of the resources quite a few flaws existing in the Mineral Policy and related Acts and Regulation have to be removed. The entire gamut of activities from exploration to mining and metal extraction must not be entirely left to the market economic forces. The mineral wealth of a country is too precious to be squandered by profit driven operators. Sustainable development ensuring benefits for both the present and future generations can only be achieved if the government regulates the activities with public interest. Mining industry has been stamped as a 'dirty industry', not without reasons. Protection of environment and maintenance of ecological balance should be a pious duty for all concerned. At the same time over activism against developmental projects would harm the progress of the nation.

Nearly 60% of India's energy need is met by coal. Our resources of thermal coal are quite satisfactory, which increased from 25 Mt to ~350 Bt in post-Independence period. The annual production went up from 30 Mt to >570 Mt. More of underground mining is needed for reaching greater depths and avoiding the environmental hazards.

Our dependence on fossil fuel may slightly reduce if electric vehicles can partially substitute the fuel run vehicles on the road. But the need for fossil fuel will remain for operating heavy vehicles, trains, aircrafts

and sea going vessels. Hydroelectric power generation has great limitation due to restricted scope of dam construction. Nuclear power cannot be considered as a viable alternative due to obvious reasons. Coal will therefore remain the main raw material for generating thermal power and will continue to be the backbone of Indian energy security for foreseeable future. However, we may legitimately hope for increasing economic utilization of renewable energy like solar (India is poor 3rd in the world) and wind power etc. in coming days, which will certainly curtail the use of coal and fossil fuel.

We will have to withstand the world wide political pressure against utilization of coal & lignite. The hue and cry about enhanced global warming due to anthropogenic activities does not hold much ground. The global warming is a celestial phenomenon and it has alternated with global cooling (ice age) since the birth of our planet ~4600 million years ago. Similar to Plate tectonics, Earthquakes, Volcanic eruption, Tsunamis, Cloud burst, Flash flood etc., which are beyond human control, global climate changes also cannot be influenced or modified to any significant extent by man-induced Green House Gas (GHG) emission into the atmosphere. The changes in the obliquity of earth's axis, its rotational speed, solar variability, polar wandering etc are some of the major causes for climate change, aided on much smaller scale by Green House Gas (GHG) emission due to natural carbon cycle since the biosphere was created. Volcanic eruption on continental scale also changes the climate for limited geological time. So, burning of coal cannot make the world warmer than what it is destined to.

Concluding Remarks

Homo sapien started the journey on this earth as a marginal mammal in the animal world without any built-in defensive or offensive armament or acumen. It neither had large teeth or nails, power as a lion nor huge built like mammoth; it couldn't even fly or run fast. The only advantage of some kind acquired by its ancestor through biological evolution was the ability to stand erect, making the two hands free. From such an insignificant existence Homo sapiens reigned supreme within less than a million years to win over all other living beings by their cognitive power rather than muscle power. They learnt to control and use fire to their benefit, went through agricultural

revolution and domesticated some animals useful to them. This was followed by scientific and industrial revolution making Homo sapiens unbound.

So, have faith on cognitive power of human kind and do not worry about future. The mineral wealth bestowed by nature is not going to be exhausted in foreseeable future. Experts from all spheres of modern knowledge are relentlessly working for the safety and well being of human kind for ages to come. And we Indians will not be left out, for sure.

Tables

Table – 1 : Growth of mineral resource base of India from 1955 to 2010.

(in billion tonnes - * ; in million tonnes – ^{m} ; in tonnes – **t**)

	1955	**1980**	**1985**	**1990**	**1995**	**2000**	**2010**
Coal	25*	111*	125*	186*	200*	210*	267*
Lignite	42^{m}	2.8*	4.3*	5.68*	5.86*	29.4*	-
Bauxite	254^{m}	2.49*	2.5*	2.63*	2.63*	2.64*	3.74*
Barytes						87 ^{m}	73 ^{m}
Iron ore (Hematite)	5*	11.5*	13.06*	12.19*	13.65*	14.63*	17.88*
Iron ore (Magnetite)				6.09*	9.65*	10.61*	10.64*
Copper ore	3.4^{m}	455^{m}	464 ^{m}	509 ^{m}	511^{m}	512.5^{m}	1.51*
Zn-Pb ore	4.8 ^{m}	241^{m}	360^{m}	466^{m}	498^{m}	531^{m}	709^{m}
Chromite	3.4 ^{m}	17 ^{m}	132 ^{m}	146 ^{m}	146^{m}	146 ^{m}	321^{m}
Manganese	20 ^{m}	95 ^{m}	135^{m}	150 ^{m}	151^{m}	156 ^{m}	
Limestone	44*	72*	73*	74*	74*	81.7*	184.9*
Dolomite	-	3.7*	3.9*	3.9*	4.08*	4.08*	8.08*
Rock Phosphate	61 ^{m}	139^{m}	177^{m}	195 ^{m}	NA	NA	314 ^{m}
Talc /Steatite	-	-	-	-	-	-	269 ^{m}
Sillimanite	-	-	-	-	-	-	67*
Tungsten ore	-	38.9^{m}	45.5^{m}	53.7 ^{m}	-	-	87^{m}
Tin metal	-	1752t	2234 t	63,699t	-	-	83^{m}

2011- Coal : 285.86* ; Lignite 40.91*

2015 - Coal : 301.56*; Lignite: 43.22*

Table 2 : Growth of mineral production in the country (1948-2015)

(In million tonnes unless otherwise specified)

	1948	1958	1978	88-89	99-2000	2001-02	2003-04	2004-05	2014-15
Coal	30.33	46.03	101.34	194.37	304.10	327.64	361.15	382.13	563.09
Lignite	0.07	0.02	3.61	12.59	22.12	24.80	27.92	30.34	43.37
Natural Gas (mill. Cu.m.)	-	-	1.72	9.25	26.88	27.86	30.90	30.82	32.69
Petroleum	0.25	0.44	11.27	32.04	31.95	32.04	33.37	34.01	37.43
Bauxite	0.023	0.17	1.66	4.39	7.05	8.58	10.92	11.70	20.20
Chromite	0.023	0.064	0.77	0.93	1.74	1.81	2.92	3.64	1.68
Copper Ore	0.327	0.111	2.13	5.13	3.08	3.49	2.90	2.93	Conc. 112.41th tonnes
Dolomite	0.083	0.177	2.00	2.26	2.87	3.09	4.05	4.30	7.38
Gold (Kg)	5612	3291	2774	2011	2586	2810	3049	NA	1322
Iron Ore	2.329	9.055	39.29	49.91	74.94	86.22	122.83	142.71	129.10
Lead Conc. (t)	1346	3341	16834	40485	62899	52386	59132	NA	
Limestone	4.05	10.53	31.06	65.31	128.79	129.77	153.39	161.46	291.01.
Manganese Ore	0.54	1.38	1.62	1.39	1.58	1.55	1.77	2.37	2.16
Silver (Kg.)	398	3416	12138	38928	53641	57672	NA	NA	NA
Zinc Conc. (t)	-	7391	66026	121993	360138	399105	485,976	590,000	1318,400
Tin Conc. (Kg)	-		570	25137	22812	13887	10630	NA	
Tungsten Conc. (Kg)	-		10749	33808					

Bauxite 2009-10 : 13.90 Mt
2010-11 : 12.64 Mt

Table 3 : Classification of mineral resources as per availability

Surplus Group

Iron ore, barite, bauxite, mica, chromite (low grade), dolomite, limestone
(cement grade), sillimanite, beach sand, soapstone, china clay, ornamental stones, etc.

Self-sufficient Group

Thermal coal, lignite, chromite, gypsum, pyrite etc.

Satisfactory Group

Zinc, magnesite, fireclay, ilmenite and rutile sand (titanium) etc.

Marginal Group

Manganese (high grade), copper, metallurgical coal, kyanite, sillimanite, flux grade limestone (low-silica), crude oil etc.

Deficient Group

Apatite, lead, asbestos, graphite, fluorite, phosphorite, potash, gold, diamond, molybdenum, etc.

Poor or Non-existent Group

Tungsten, tin, antimony, platinum group, cobalt, nickel, vermiculite, REE
(for high-tech uses)

Table 4 : Ranking of India's contribution in mineral production of the world

Barytes	2nd
Talc/Steatite	2nd
Coal & lignite	3rd
Chromite	3rd
Iron ore	4th
Sillimanite/andalusite	4th
Bauxite	5th
Manganese	6th

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THE ARMENIAN NETWORK AND THE MADRAS MAYOR'S COURT: LEGAL DIALOGUES IN THE EIGHTEENTH CENTURY

SANTANU SENGUPTA

"All networks, even the most solid, sooner or later encountered difficulty or misfortune."[1]

As the English East India Company slowly gained preeminence in the trading and political realm of the Indian Ocean in the latter half of the eighteenth century, the ubiquitous, dynamic and resilient Armenian trading network seemed to enter a course of decline. The eighteenth century, generally viewed as an ominous period in the history of the Armenian network, saw the fall of New Julfa,[2] the network's hub, and the beginning of protracted Armenian negotiations with the English East India Company dispensation in the Indian Ocean. The simultaneity of the two developments has often been framed in terms of the rise of the English and the fall of the Armenian network. Yet, it is worth asking, whether such a story of decline was so inexorable and completely shorn of resistance or maneuver. For as an extended diasporic network spread across the ocean, the Armenians had built up considerable reserves of capital, information making them especially important as cross cultural agents and political brokers. European observers referred to the Armenians with a shade of awe mixed with envy, regarding their dominance in the littoral trade of the ocean.[3] Historians have also given importance to the Armenian role in the founding of the early English East India Company establishments in India.[4] Still, several narratives of the latter half of the eighteenth century persistently describe a stark decline[5] viewing the Armenians as a gullible group, surrendering without a fight to British interests.

This article takes a counter view. It intends to track and recover a different version of the story during a period of great transitions in the Indian Ocean arena. Reading against the rhetoric of decline, it

tries to record how the Armenians adapted to the opportunities and conditions of the pre-imperial East India Company regime to develop a structure of operations to offset the collapse of New Julfa. The article intends to see whether in the line of Blaire B. Kling's theory of an Indo-British partnership in the formative years of the Company regime, the Armenians also managed to play a crucial role in the formation of the colonial structure in the long run.[6] In other words, it asks the question whether the emerging Anglo-Armenian negotiations were a consequence of mutual appreciation of the opportunities present in the empire as well as in the network. In addressing this question, the article looks more closely and critically at the processes and strategies of interaction largely through the prism of Armenian litigations at the Mayor's Court of Madras. Thus instead of viewing Armenian participation in the Mayor's Court as a markers of decline for the Armenian network, the article locates the process in the making of a new Armenian self in the dialogic space offered by the Mayor's Court.[7] The article looks at the space that law and litigation produced and how it allowed the Armenians to negotiate with the existing situation and simultaneously to exert their agency in an era of rapid change?

Concepts : Diaspora & Network

Armenian merchants had long been engaged in long distance trade that extended from the east coast of Africa through the Indian Ocean to the Philippine islands in the Pacific. Their commercial structure has been alternately defined in terms of a diaspora of a network of circulation and exchange. Trading diasporas were groups that followed a specific cultural practice that distinguished them from their respective host societies. This preserved the stability of a specific identity, which helped the members of the diaspora to move freely and operate in distant zones.[8]

The Armenian diaspora has been seen as a self-regulating structure with an elaborate institutional arrangement, independent from the political sphere of host societies. The unquestioning dependence on a common regulatory institutional framework, encouraged intra-group cooperation among the Armenian traders.[9] These traders travelled and established settlements in various major cities of Asia and Europe.

The circulation of information and capital, along with a uniform mechanism to solve mercantile disputes, based on a common system of arbitration organized around moral institutions like churches, acted as the central device for their activities.[10]

Viewed from the vantage of a network, the Armenians seemed to have worked with ideas of 'exclusivity'.[11] The exclusivity of circulation or the avoidance of leakage of information was considered essential for the preservation of the idea of 'trust' as social capital.[12] Echoing the views of trading diaspora proponents, the circulation network theorists believe that trust was preserved by organizing the community and its moral fabric around institutions like churches, schools and a legal culture, replicating that of the homeland.

Bhaswati Bhattacharya has pointed out that the conventional definitions of diaspora or networks do not apply unconditionally for the Armenians.[13] By the early eighteenth century, several sub-nodes had formed beyond the realm of New Julfa, as the sojourning actors began to organize capital and personnel without any real dependence on the centre. She however does not reject the idea of an abstract cultural and moral unity of the dispersed community and also gives importance to the sense of longing for the real or imagined homeland and the institutions related to it.

Although the Armenians used the knowledge and culture acquired in the host stations to reap benefits from it as cultural-political brokers, their flexibility was supposedly regulated to preserve the intra-community cohesiveness.[14] Therefore, the conventional models of trading diaspora and circulation network that have been attached to the Armenian traders, have emphasized a sense of exclusivity. This exclusivity in terms of identity and moral culture, organized around institutions like schools, courts or churches reflected the customs of the node or the homeland, which, in turn kept the system of the network running. In the scheme of affairs, the legal culture of the community also had to bear identifiable and exclusive markers making it distinct from the host society in which they functioned.

Armenian Legal Culture & Social Capital

The conventional perspective on Armenian legal culture seamlessly matches the claims of exclusivity. Built into the structure for the

operations was a strong sense of moral authority, confidence in arbitration protocols established in and disseminated from New Julfa. A unique apparatus of organizations constituted made up the legal system of which the most important ones were the Vacharakanats Zhoghov or the merchants' assembly, the Church and the Jumiats or local courts.

The commenda partnership model of Armenian trade ensured the circulation of capital and patronage from the masters in the nodal centre of New Julfa to the agents at the remote stations.[15] This defended the integrity of the network by maintaining a direct dependence on the node through inter-personal transactions.[16] However, it has been suggested that when commenda agents, overtime, settled in various disparate stations and acquired considerable capital, they tended to become independent of their masters in New Julfa and formed their own regional commenda networks.[17] But in contradiction, Khoja Petros Voscan or Petrus Uscan (Sic.), a commenda agent who subsequently became a mercantile magnate in the eighteenth century, continued to bestow importance on the larger network. The institutions he sponsored in New Julfa played an active role in influencing the Persian authorities to protect the autonomy of New Julfa. It is argued that although Voscan became independent in terms of capital, he continued to rely on the Armenian moral institutions and social network to control his mercantile grid.[18]

The concept, of 'Trust' emerged as critical to the functioning of this system.[19] Trust, in turn was regulated through reputation, which was conveyed through the correspondences circulating across the network. Gossip, acted as an instrument of control and determined the reputation of merchants operating in the circuit.[20]

The central regulatory institution, Vacharakanats Zhoghov, situated in New Julfa, addressed all disputes between merchants within the network. It was presided over by the Kalanthar or the community leader.[21] The principles of the Vacharakanats Zhoghov were implemented in the host stations by the Jumiat, i.e. the local courts, formed by resident or sojourning Armenian merchants in the respective settlements.[22]

The Armenian Churches in the host stations under the supervision of the All Saviour's Monastery at New Julfa, played an important role

in preserving a sense of moral unity in the diaspora. The Church also played the key role of being a junction in the process of information sharing. For example, correspondences between the All Saviour's Monastery and the Holy Church of Nazareth in Calcutta would contain information on local Armenian merchants. Issues like misconduct in trade or breach of contracts, along with the news of failure to provide monetary endowments to the Church would be discussed in details. This occasionally caused damage to the reputation of the concerned merchant.[23] The church also functioned as a site of contract signing, aiming to impose religious-moral obligations in mercantile affairs.[24] The church was also a place for submitting wills as it played a role in managing properties and resolving inheritance issues.[25] This ensured the preservation of exclusive group rights over property that strengthened the integrity of a diasporic community.

The Vacharakanats Zhoghov, the Jumiat and the Armenian Church formed the institutional backbone of the legal culture of the diaspora.[26] The Armenian merchants seemed to be concerned about preserving their indigenous legal identity in the host stations. Datastangirkh Astrakhani Hayots codified the Armenian legal norms and customs practised by the Armenians residing in Astrakhan.[27] Although, the compilation concentrated upon the practices in the Armenian court called Rathaus in the Russian city, it aimed to specify, share and remember the broader legal identity and ideology of the Armenians.[28] These codes were well known and used effectively in various parts of the diaspora and were possibly used as uniform codes for arbitration.[29] The unswerving struggle of the Armenians in Astrakhan to extract legal autonomy from the czarist state highlighted the urgency of the Armenians to protect their distinctive legal status.[30]

Maintaining a social-institutional closure has been seen as a reason behind the urgency to protect their legal status by the Armenians in the diaspora.[31] Social closure refers to the procedure of forming a closed communitarian identity by constructing a set of acceptable behavioural and institutional norms that distinguished the members of a closed community from the others. Adherence to such norms made it easier for the community or network to monitor its members and impose a uniform moral standard that helped to create a sense of trust among the members. Any deviation from the closure or the

boundaries of the institutional or cultural sphere of the community could weaken its social capital. Those who argue for the death of the network have suggested that the strangulation of the institutional apparatus of the network was responsible for this. Sebouh Aslanian in particular connects the fall of the New Julfa with the final collapse of the network. The decline of New Julfa and of all the institutions connected with this node, created a void exposing it to the pressures of competition from the European companies in the Indian Ocean.[32]

Soren Mentz also agrees with Aslanian regarding the irreplaceable importance of New Julfa. According to him, with the decline of the moral centre, the Armenians began to get involved in alien institutions like the English Mayor's Court. This led to the collapse of the intra-community trust that held the network together.[33] Bhattacharya considered that the Armenians had already formed patterns of accumulation within local economies, so they were not overly reliant on New Julfa. Rather the political ascent of the European companies, especially the British, forced them into a new identity of subjection, leading to the collapse of the trading network.[34]

These theories, however, do not take into cognizance, the existence of an inherent plurality in the Armenian worldview that allowed them to enter into a dialogue with multiple loci of power across their far away settlements and trading routes. They also do not consider the possibility of survival strategies that the network adopted. I would therefore, argue, that the Armenians consciously formulated a policy of engaging as creatively as possible with multiple systems and institutions to acquire the necessary leverage to survive in changing conditions without losing their original identity and connections.

Perhaps the theory of structural holes might be used to rethink, the strategy and implication of multiple associations of the Armenian merchants that essentially, tended to go against, the limits of network closure that had been considered as the key of Armenian success.[35] Structural Hole theorists like Roland Burt suggests that social capital is effectively created by a network in which elements are able to orchestrate connection between disconnected segments. They suggest that in closure situation, the circulation of information is more restricted within the group; this excludes the group from the

information of what is happening outside. This reduces the scale of opportunity of a group. However the elements situated in between groups can participate, broker and diffuse information across groups. This gives the elements indulging in a Structural Hole system, chance to make best use of information by using it to extend opportunities and also allows them to control the flow of information across networks.

I would suggest that the Armenians used their position in the structural holes to interact with various agencies and alien institutions to gather knowledge and negotiate with them to reap benefits. The story of the Armenians in the Mayor's court of Madras also suggests that such interactions did not inevitably lead to the diffusion of the network. In contrast, it gave them leverage in the emerging colonial setup. It also allowed them to articulate a rhetoric that helped in utilizing the new dispensation and its apparatus, without diluting their distinct identity and status.

The Mayor's Court of Madras

The English East India Company began to consolidate its control through the establishment of fortified port towns in Calcutta, Madras and Bombay. These towns were inhabited by heterogeneous groups, who were encouraged to settle down with the promise of good municipal administration and commercial opportunities. These assurances were supported by a model of governance that accommodated indigenous concerns. The governing principle was broadly based on impartiality of justice, easy regulations and civic provisions in agreement with the specific conditions of the concerned station.[36] Information regarding the local conditions therefore had to be collected diligently to formulate the designs of running the regime.

Thus the legal regime, formulated by the East India Company in the eighteenth century Indian Ocean colonies, integrated existing practices of arbitration backed by local states as well as by merchant networks. This integration was facilitated by establishing legal contact with the indigenous groups. Legal contact facilitated transfers of and borrowings from miscellaneous local practices that helped in the long term formulation of the imperial legal system. The Mayor's Court of Madras appeared as a Contact Zone that assisted in this exchange of knowledge.[37] According to Mattison Mines, the Mayor's Court was

also an important site for groups and individuals to assert their self-representation, which allowed them to position their self in the dialogic process in the given social space.[38] The Mayor's Court of Fort St. George had first emerged in 1688-1689 with the aim of establishing the Company's control over the town with a stable administration and offset the continuous tension between the Company administrators and the various indigenous groups. The Court of Directors intended to form a system of shared administration in Madras, in which Company officials and merchants could be integrated with the various groups in a common governing organisation.[39] The Court of Directors wanted the Armenians, 'Hebrews', Portuguese and also representatives from the 'Hindu and Muslim castes' to be included as aldermen to create an ideal pluralist platform.[40] The respective community representatives could become 'aldermen and burgesses' and also had a say in selecting the mayor.[41] But the institution initially remained weak and its subjects reluctant to get involved with it.[42] A royal charter of 1726 gave the Mayor's Courts in Madras, Bombay and Calcutta, the authority to deal with civil cases involving British subjects, all Europeans and "natives" in case they were serving or dealing with the Europeans.[43] However, the local groups began to use the Mayor's Court in increasing numbers in the course of the eighteenth century and the suspension of the indigenous groups from the Court in 1753 led to confusion as they were already intimately involved in it.[44]

The court had originally started as a "court of conscience", where petty cases would be tried and that influenced the everyday experiences of the inhabitants.[45] Initially, the court allowed the multiple indigenous customary laws and traditions to be used in arbitration. This led to an uneasy cohabitation of multiple indigenous norms with English law, creating grounds for conflicts.[46] The reluctance of the Court to include the indigenous population in the system had partly come up due to protests from these groups against disliked customs of the court, like, oath taking.[47] The Charter of 1726 further intended to change the identity of the court, from being a Company institution to a court of the Monarch of England, with all the norms that were then prevalent in an English court.[48] The local groups overlooked this change and negated the restrictions introduced in 1753 to persist with

the use of the Mayor's Court.[49] To gain access to the court, they used several fraudulent methods, like transferring their disputes to Europeans.[50] The indigenous opposition to the court came from the community heads, who wanted to utilize the court in ways that suited their interest. In a petition submitted in 1736, the community leaders demanded the system to be revised in a way that the control of basic arbitration could be retained by them, while Company's tools could be used to ensure the execution of decrees.[51]

The court adopted a policy of accommodating local customs, even as it aimed to standardize procedures according to the British legal system.[52] The intention of establishing the hegemony of English legal culture was rather lucid. The manual on the methods and forms of proceedings in the Mayor's Court stressed on the general practice of mentioning the primacy and benevolence of the English Monarch and law to the participants during the proceedings, possibly exposing the intentions of constructing a common subject identity among the heterogeneous participants.[53] Simultaneously it also stated its intention to adopt the local practices of the heterogeneous population of Madras.[54] For example, to make the procedure neutral, the court formulated a policy of summoning twelve member jury boards for each case. One half of the jury would be summoned from among the compatriots of the non-British party to ensure that their specific legal culture was comprehended correctly.[55]

Indigenous communities, especially the stronger merchants, utilised this opportunity to exert influence on the colonial institutions.[56] In the next section we will see how the Armenian merchants tried to utilise and influence the Mayor's Court, while they became increasingly engrossed in it, contrary to the historical structure of their network.

The Armenians and the Mayor's Court

The Armenians were among the most proactive members of the Madras municipal administration and Mayor's Court. Historically they were instrumental in establishing the English Company as a commercial force in the subcontinent using their connections among the local ruling houses. For instance, Khoja Israel Sarhad had been

instrumental in acquiring the permission for the Company's lease of Sutanuti, Gobindapur and Kolikata from Azim-ush-Shan, the Mughal governor of Bengal in 1689.[57] He was also helpful in acquiring the crucial farman from the Mughal emperor Farrukhsiyar.[58]

In the formative years of the Mayor's Court, between June 1689 and March 1719, Armenian merchants were seen in litigation against each other on several occasions.[59] This suggests that the use of the English court was not catalysed merely by the vacuum created by the fall of New Julfa, it reflected a more conscious strategy of the Armenians. These cases, mostly about recovering debts, displayed in their narratives a tendency to incorporate Armenian moral culture that forced the involvement of referees from the community to decide the cases.[60] Therefore, the Armenians from this very early stage were interested in utilising the Mayor's Court, within certain rhetorical limits and they attempted to use both the Mayor's Court practices, as well as their community norms. The participation of the Armenians was not limited to being litigants in the Mayor's court. Since 1690 the Armenians functioned in the capacity of judges and aldermen.[61]

Armenians as an interest group in the Mayor's Court had considerable bargaining power to influence it.[62] But it should also be remembered that the Armenian collaboration with the English East India Company was mainly as free agents, who collaborated analogously with several interest groups and other aspiring colonial powers and unsettled the monopolizing tendencies of the English Company.[63] The relationship was not uniformly congenial, but either due to fear or admiration, the Armenian merchants were coveted by the English East India Company. Realising the potential of the Armenian-Eurasian trading network, the Company intended to hold them as associates.[64] Sporadic collaborations between the Company and the Armenians was formalised by the 1688 treaty signed with Khoja Phanos Qalantar or Phanoos Kalanthar (Sic).[65]

The Armenians also projected themselves as an important factor in running the everyday administration of the Company government.[66] The Madras Council felt that the Armenians were efficient intermediaries to intercede between the Company and the various other communities. Therefore, it was necessary for them to integrate

the Armenians closely into the process of state formation. For instance, when the indigenous population was banned from approaching the Mayor's Court in 1753, the Madras Council was reluctant to bring the Armenians under that category, perhaps due to the fear of distancing them.[67] While we can sense the British interest in engaging with the Armenians, it is worth questioning the rationale behind Armenian approach towards the Mayor's Court, when the conventional theories condemned such interactions with an external institution as a portal to decline.

Historians have tried to rationalise the participation in the Mayor's Court by considering the lack of formality in its structure.[68] Inclusiveness in its structure made the court hybrid and it allowed a greater scope of "individualization" of practices in the court.[69] This sanctioned the Armenians an opportunity to expand their options without drastically altering their earlier judicial and moral philosophy. At least initially, the court reflected the character of early Madraspatnam, being informal and hybrid in its approach, incorporating indigenous norms along with British standards without much centralising agenda.[70]

The degree of formalisation, however, began to intensify visibly with the charter of 1726. For example, the court made it mandatory for the litigants to involve a professional attorney who had to ensure that the bills of complaint and other documents met the required structure of the court.[71] The formation of a convention regarding the nature of acceptable documents, or the mandatory use of English as the language of the court, along with the requisition of formal and attested translations suggested a move towards homogenisation of culture.[72] Also, the identity of being an alien institution in the Indian Ocean mercantile world that claimed to deliver justice on the basis of equity attracted cross-cultural conflicts. Particularly in situations where the structural limitations of the indigenous merchant courts failed to attract trust of impartiality and effectiveness from cross cultural participants. For instance, Khachik Pogos or Catchik Pogos (Sic) an Armenian Merchant had proposed to resolve his disputes with Cammo Caul Chitty and Adapamum Chitty,[73] in any of the merchant courts, other than the "Malabarese".[74] The defendants however remained

adamant that they would go only to the "Malabarese" court. In a situation of such impasse, the Mayor's Court emerged as the only agreeable option. Thus the failure of the customary community courts to provide redressal in case of cross cultural conflicts allowed the Mayor's Court to emerge as a viable option.

The charter of 1726 provided a scope to litigants residing outside the territorial jurisdiction of Mayor's court to appeal if the dispute had originally occurred within the territory of the court's jurisdiction.[75] The prospect of approaching the court while the litigant was not a current resident of the town was an attraction for the sojourning traders. Armenians from Pegu and Manila approached the court, consequently creating a familiarity with the legal culture of the Mayor's Court across the Indian Ocean.[76] This could have also encouraged the Armenian merchants to increasingly expand their activities as moneylenders and respondentia dealers in the eighteenth century.

The tendency to utilize the Mayor's Court and its executive tools to ensure implementation of cross cultural contracts was clearly visible in several cases. In the contemporary political condition of Madras, the English East India Company provided the most effective enforcement and coercive mechanism that the Nawab or the multiple community courts failed to provide.

The Armenians showed an interest in utilising the coercive enforcement mechanism of the Mayor's Court. On 20th July, 1771, Stephan Gregory and Phanos Aviet or Fanos Aviet (Sic) filed a case against Shah Rushan for the failure to repay a respondentia loan within the stipulated time. The deposition revealed that Rushan had borrowed 4333 Pagodas from Abdul Qader Shah and Mudasha Shah and 3333 Pagodas from Stephan Gregory and Fanos Aviet on respondentia on 23rd February 1770. The ship Dodley and a portion of its merchandize was mortgaged as security to the respondentia lenders. Gregory and Fanos claimed in their deposition, they had paid the pending amount of Abdul Qader Shah and Mudasha Shah to acquire the rights over their respondentia bonds. On repayment of the loaned amount, Gregory and Aviet had filed a case previously on 23rd July 1771. The court directed the Sheriff of Fort Saint George to take action regarding the property mortgaged by Rushan against the

concerned respondentia on Dodley. The court also assigned the prescribed warrant of execution to the Armenians. The petitioners pleaded that the property and effects to be kept in charge of the Sheriff till the stipulated probationary time of the royal charter would end, allowing them to dispose the mortgaged property to recover the money. Shah Rushan claimed that the seizure of property and also the transfer of respondentia bond to the Armenians had been done against the sense of 'justice and equity prevalent in the town of Madras'. In its verdict of 15th October 1771, the court directed the Sheriff to hold on to the seized portion and hand over the Armenians only the portion proportionate to their original respondentia amount invested by them. Thus it seemed that sometimes, to make use of the coercive mechanisms offered by the court, the Armenians ended up crossing the acceptable boundaries of law. But nonetheless this appeared as one of the crucial attractions for the Armenians to influence their participation in the court. Unlike moral institutions like Jumiat, the charter of 1726 made a compelling claim of forcing participation (and obedience) from the defendants and witnesses.[77] The court wanted to devise a tactic to ensure that it decrees were followed and fulfilled. The sheriff was supposed to extract compensations and imprison the defendant if required.[78] The court also ensured binding measures like the confiscation of properties of truants that discouraged malingering from the court.[79] While the coercive force of the court made it popular among indigenous groups including the Armenians, it in turn started to introduce small but significant changes in the trading culture of the zone.

However, the apparent leap of faith in the early colonial legal culture, catalysed by the notion of a possibility of fairness, did not necessarily turn the mercantile groups into collaborators with the colonial regime. Rather, they acknowledged the colonial legal culture and the indigenous legal regimes concurrently, i.e., they claimed their autonomous legal position while recognizing the colonial regime.[80] But whether Lauren Benton's notion of flexible legal pluralism could be extended to the later period when legal conversations were buttressed by military and coercive power is doubtful. But at the same time the extent to which homogenization and standardization

occurred under the Mayor's Court also needs to be reviewed. The Armenians, through their regular negotiations with colonial institutions, underwent a degree of metamorphosis, but as the narrative of the Mayor's court would suggest, there was always an unswerving strategy to preserve their community agency and identity, even when they dragged each other to the alien court.

Litigation among Armenians

The Armenian encounter with the Court till the first half of the eighteenth century did not create discomfort for them, partly because the court had not enforced any drastic measure to alter the ideology and identity of the community. In cases involving members from the same community, the court generally upheld their indigenous customary norms and moral concerns. It initially followed a general custom of summoning and handing over the proceedings to a body of referees representing the community.[81] It has been argued that such arbitrary involvement of indigenous mediators in the Mayor's Court undermined the historically constructed autonomy and purpose of the indigenous mediations that were based on the principle of mutual recognition of all parties.[82] Nonetheless, the Armenians found an opportunity to lend their voice to the legal system and exert their influence on it.

In 1744 Khoja Khachik Pogos or Pogose de Cauchik (Sic) filed a case against Khoja Murzam Mkrtum or Muckerton (Sic) on the allegation that Mkrtum had sold him inferior goods at a higher rate.[83] Khachik had initially told the defendant that he would agree to approach a "Jumiat" to resolve the dispute. However, on realising Mkrtum's indifference, Khachik forced him to come to the Mayor's Court.[84] Khachik also petitioned for Armenian referees to be involved in the concerned arbitration, displaying the policy by means of which they aimed to use the Mayor's Court.[85] The appointed referees were given a free hand to use their customary conventions.[86] The hybrid premise of the Mayor's Court allowed this adoption and absorption of the court into the indigenous legal structure to function with a certain ease. This sense of fluidity allowed the Armenians to invoke the rhetoric of trust and goodwill that had been the central ingredients of the community's moral discipline into the narrative structure of the court.[87]

But the crossover of the two legal articulations was not as smooth as it appeared. From the 1770s the court began to assume a much more dominating tone. In a significant departure from the earlier practice that unconditionally upheld the decisions of the indigenous arbitrary bodies, the court began to scrutinise closely before concurring to it.[88] This tendency to rationalise the practices of the indigenous legal customs by comparing them with English morality created a basis for the hegemony of the Company apparatus in colonial towns like Madras. Implicit in this process was the possibility of transformation of the trading networks, which no longer remained wedded to their own legal practices.

As the leakages opened up the Armenian moral space to the dissecting gaze of the English institution, the cultural boundaries of the community began to be unsettled. In the next section, we will try to look at these situations of discomfiture and the line of Armenian reaction to those.

Inheritance and Conflict

The acceptance of British hegemony by the Armenians was not seamless. There were tensions and fissures. The Anglo-Armenian interaction did not lead to an absolute transformation of identity; rather it subsumed a strategic coexistence of older identities with the demands of the new Company state. This strategy was perhaps best displayed in the wills and disputes over inheritance.

These wills tried to repeatedly stress upon the uniqueness and unity of Armenian cultural and diasporic identity. For one, the wills represented the wide connections maintained across the diaspora. Armenian merchants continued to leave donations for the institutions in their "homeland" in the late eighteenth century.[89] It is interesting to note that the property reserved for individuals across the wide network was put under the supervision of the Madras Mayor's Court for a proper distribution.[90] The Mayor's Court not only gained a superior agency regarding the disbursement of property but also exerted control over the rights of institutions like churches that had formed the nucleus of the identity of the network. There were even instances when the Armenians would no longer trust their indigenous

institutions but would seek guarantee from the Mayor's Court. For example, in the will of Thomas the son of Isaac', a number of endowments had been assigned to the Armenian Church of Madras. Among those, he had donated a plot of land to the Church on condition that he and his sons could continue to reside on the grounds.[91] To ensure that the Church administration followed all the clauses, Khoja Agavelly Satur (Sic), the Warden of the Armenian Church of Madras was asked to take an oath in the court.

Despite such exposure to the English institution, the wills held on to the rhetoric and specificities of the Armenian world view. The following excerpt from the will of Johannes Hovan Calendar suggests how the idea of *being an Armenian* was preserved-

> *"After my death my body to be buried according to law and customs of the Armenian Church of the Holy Illuminator Religion ... the maker of this last will do hereby acknowledge that in the year 1785 on the 7th September by customs of the Armenian Church of the Holy Illuminator religion and the customs and law of my nation and (of the) Armenians in habiting at Madras I have been wedded by the priest Father Stephen Johaness, after the law with Mertha the daughter of W Matheus ..."*[92]

The concern to preserve Armenian identity in an institutional space driven by English sensibilities suggests that the Armenians sought to absorb the new culture without having to relinquish their own. The above mentioned excerpt hints at the idea of- 'law of the Armenians residing in Madras', the new self-representation adopted by them, which sought to preserve the New Julfan values while negotiating with the demands of the new regime. The close participation of the network across the Indian Ocean extended the impact of the new nomenclature over the members across the oceanic span. This could have affected the general identity of the network beyond the territorial limits of Madras, thus facilitating the latter colonial settlements in Penang or Pegu. Armenians there would be already acculturated by the Madras experience emerging as crucial instruments in the disposition of the Company's expansion.

Armenian wills invariably designated administrators from within the community. It suggested that they wanted to preserve the property within the fold of their community. The Compendium suggests that

the law makers were most concerned about the smooth transition of property within the family and to the creditors of the deceased. [93]

Several issues that had been regulated by the community now increasingly tended to open up to the scrutiny and rationale of the legal values of the Mayor's Court. Interventions were common in cases where individuals passed away without leaving a will or testament behind. The Mayor's Court had devised a clear policy of selecting the administrator of such estates on their own discretion.[94] The court could also reject the administrators named in a will and hand it over to the nearest of the kin, based on their own rationale.[95] The administrators were put under the scanner of the court through regular audits of the estate's accounts.[96] Distribution of property was also put under the observation of the court. The degree of control suggested in the charter regarding the handling of an estate seemed to go against the general concerns of the Armenian wills.[97] The control over distribution also allowed the Mayor's Court to extend contact with the concerned parties across the network, even over those who resided beyond the political jurisdiction of the court. The familiarity constructed through such contact facilitated the transactions between the Armenian network and the British empire in the long run, not only in Madras but over a vast expanse from London to Philippines.

The wills also demonstrated the local ramifications of the Armenian network. Increasing participation in the adjudicatory practices of the Mayor's Court, to maximize their options in the rapidly changing milieu of the period, brought important consequences. The initial pragmatism gave way to a more considered appreciation of English law that in the long run impacted on the Armenian connections and arbitrary practices. Just how these changes occurred and were experienced by the Armenians is a question that we will address through a close reading of two major cases. Taking the cue from the work of Mattison Mines, on the changing self of the Indian legal subject, we will try and examine how the Armenian conception of custom and identity negotiated the formal legal apparatuses of the English East India Company.

On 25th March 1783, Hovhaness Ter Jacob (Johaness Ter Jacob) and Sanguin (sic.) Tsaturian (Satur) two Armenian merchants from Madras filed a cross bill against Lieutenant Johnson Kennedy and

Janet Kennedy over a disputed probate assigned to the estate of the deceased Armenian merchant, Hovahaness Benedict. The Kennedys, in their original appeal in the King's Ordinary, asserted that the Mayor's Court had improperly granted the probate and rights of administration to the Armenian merchants, instead of granting it to Janet, ex-wife of the deceased. The Kennedys claimed that in accordance with the safeguards of British law, the nearest of kin of the deceased held the primary rights to the administration of an estate, they therefore argued that the decision had to be reversed in favour of Janet (as the widow of the deceased) and her current husband Johnson Kennedy. Hovhaness Ter Jacob and Sanguin Tsaturian, defended themselves on the grounds that the grant of administration had been done on the basis of unanimous agreement among various parties interested in the affairs of Hovhaness Benedict's estate. The parties in the agreement prior to the ratification of the grant of administration included, Janet Kennedy (she was still a widow and known as Janet Benedict, at the time of the agreement), the principal creditors of the estate and other relatives of Hovhaness Benedict, including Edward Raphael the brother of Janet and Arathoon Benedict, brother of Hovhaness.[98] They had followed the principles of Datastangirkh Astrakhani Hayots as these applied to inheritance of any estate without a proper will. Datastangirkh Astrakhani Hayots gave equal or perhaps more importance to the creditors of the estate than the next of kin in deciding the fate of the property.[99] It thus reflected the mercantile outlook of the Armenians, whose concern for preserving mercantile capital and the economic vitality of estates overrode any other consideration. Hovhannes Ter Jacob and Sanguin Tsaturian asserted that they had not taken the administratorship to fulfil personal interests. On the contrary, the parties present during the agreement and the principal Armenian merchants of Madras requested them to take over as administrators.[100] Their statement also reflected, how community interest was apparent in the concern of the merchants regarding the preservation of the estate in the commercial arena. As the appeal put it —

> *"... the most principal merchants residing at Madrasapatnam who from the desire of putting an end to all litigation and saving expences and prevent the destitution of the estate and effects of the said deceased*

whose concerns in trade were very extensive in different parts of the world and very intricate and of course required much attention ... so as to bring the whole to one point of view and to secure the same for the benefits of all those interested in the estate ..."[101]

Such a consensus among interested parties including principal creditors and family members, however, had to be ratified by the Mayor's Court, showing the new legal position of the Armenian trading community. The norms mentioned in the Datastangirkh would suggest that the administrators selected through such a consensus would hold supreme authority regarding the estate, other than the Church or the assigned Kalantar, the Armenians in Madras had by now accepted the practice of securing the Mayor's Court's ratification at various stages. Even in the face of allegations of misappropriation of funds, non-performance of duties as the appointed administrator, mishandling of balance books and records, the constant defence of the administrators would be their timely submission of reports and inventories to the Mayor's Court.[102] It is the interplay of customary norms and of Mayor's Court procedures that made the cases representative of the Anglo-Armenian interaction.

The counter claims of the Kennedys bring to light distinct Armenian social conventions regarding property and inheritance issues. It is evident that property aligned to mercantile capital was a community concern. It was clear that the approach of administrators and the community towards Janet changed after her remarriage with a non-Armenian; she in fact claimed that after her marriage, she and her husband were not allowed to see the accounts regularly.[103] The account books were also removed from Janet's residence and they were informed that those account books had been destroyed by a fire at Hovhaness Jacob's residence.[104]

Interrogations during the trial clearly revealed how the Armenians had developed a mechanism to justify their position that balanced the procedure of the Mayor's Court, with that of their community mechanisms. The administrators suggested that they had obtained the office not only through proper legal process of the Mayor's Court, but also on the basis of trust and good reputation earned within the community.[105] The witnesses from the Armenian community also

seemed to support the retention of the control of the estate by the administrators. Edward Rafael and Miguel Hovhaness suggested that Janet seemed to work on the direction of Johnson Kennedy, who did not have any idea regarding the workings of an Armenian estate. Leaders of the community including Arathoon ter Khatchatoor and Shamier Sultan or Shahamir Soolthanum (also known as Shahamir Shahamiryan) testified that the administrators had worked properly and according to the norms prevalent in Madras.[106] While in this case, the court decided to dismiss the petition to the relief of the Armenian community, the probability of such interventions in future forced them to rethink their position and self-representation.

The Armenians continued to look for a mechanism and rhetoric to balance their diasporic self-representation with the new socio-legal conditions constructed by the Mayor's Court. Corresponding to the changing power equations in Madras, the Mayor's Court began to assume greater hold over the Armenian legal culture. While the pragmatic use of the Mayor's Court apparatus for extracting mercantile benefit in the contemporary socio-political milieu increasingly drew the Armenians towards the court, it also posited existential crisis within the community.

The next case is important as it demonstrates the Armenian attempt to negotiate the crises that emerged in the wake of the Mayor's Court's intervention. The onus on the community was to try and maintain the tenuous balance between their network profile and their status as Company subjects.

A case relating to the inheritance of the property of Gregorio Miguel (sic) or Grigor Migaelian, an Armenian merchant filed in 1785, shadowed of crisis that the community faced. Grigor Migaelian's estate was at the centre of dispute since his death in 1776. In 1785, Magdallena Fontheilles, ex-wife and widow of Grigor Migaelian, filed a petition in the Mayor's Court against the appointed administrators of the estate. She complained that the administrators- Sett Aviet (sic) or Setrak Avetisian and Sanad Coja Maul (sic) or Manvel had been depriving her of her rights to the estate, since she had remarried.[107] She asserted that initially she had been denied any portion in the estate, on the allegations that she had eloped even before the death of Grigor

Migaelian.[108] Once the Mayor's Court granted administrator-ship of the estate to Avetisian and Manvel, Magdalenna submitted her petition to the court to claim her share. By then however, the court had approved a group of arbitrators from the community to decide upon the issue of the inheritance and also regarding the procedure the administrators were meant to adopt.[109] The court decreed that all the claims on the estate, inventories prepared by the administrators appointed by the court and decisions regarding the dispensation of existing debts, credits and unsold goods and effects would be reviewed by a five member arbitration board. Shamier Sultan Johaness (sic) or Shahamir Shahamiriyan, Marcar Johaness (sic) or Markhar Hovhaness, P. Hovhaness, Golamier Agavelly Satur (sic) or Goolhamier Agah Vily Tsaturian and Jacob Patum (sic) or Hovak Patum settled the dispute between the administrators of the estate and Zeptha Stefanian, the sister of the deceased.[110] In its settlement of September, 1778- the tribunal made some crucial decisions that reflected the stance that had been adopted by the Armenians in disputes regarding property and inheritance. Although the administrators and even the tribunal had been practically subordinated to the Mayor's Court as they were tacitly appointed or their appointment had to be ratified by the Mayor's Court to be effective, the tribunal continued to assert a specific identity in its choice of narrative. The rhetoric used to claim legitimacy for the tribunal and the administrators perhaps showed the balance that the Armenians sought to establish between the pragmatic usage of the court and preservation of the symbolic capital of the Armenian identity. The tribunal stated-

> *"... therefore we proceed to our determination that the said Gregorio Miguel dying intestated, Seth Ter Avieth and Sanad Coja Maul the son of Coja Maul relations of the said Gregorio Miguel deceased of Madras merchants by terms agreeable to the customs of Armenian merchants and agreeable to the noble use of Great Britain was granted by the Mayor's Court at Madras with letters of administration for the estate of the said deceased Gregorio Miguel ..."*[111]

The community identity of the tribunal was highlighted in a few other instances. Particularly interesting was the survival of a distinctly Armenian practice of ratifying the papers pertaining to the wealth

and credits of the estate by the supreme patriarch of the Armenian Church- the seat of Holy Etchmadzin.[112] The original verdict of the tribunal also refused to consider Magdallene Fontheiless as a legitimate heir to the estate and passed their verdict in favour of Zeptha Stephanian. They said —

"It does appear before our tribunal that the said Zeptha Stefan as a legal heir of the said Gregoris Miguel deceased and no other persons and Mess. Sett and Avieth, Coja Maul and Rafael relations to the said deceased who shall be satisfied & obey the customs of all Armenian Christians ..."[113]

The tribunal's non-acceptance of Magdallena as a legal heir was influenced by the norms regarding divorce-separation and inheritances mentioned in Datastangirkh Astrakhani Hayots. The law book suggests that in case of a separation, the woman must receive *Ozhit* i.e. a gift or endowment that she received from her father during her wedding and *pruig*, a pre assigned portion in an estate in case she is separated from her husband. But her claims on the estate would be limited as her share or her legitimate inheritance, in case her ex-husband passes away. She could be a legitimate inheritor, only if her ex-husband had mentioned that in the will or if he was held responsible for the separation according to the customs of the Armenian Church.[114]

The degree of autonomy in applying these customary norms was however limited. The tribunal had to acknowledge in the very next passage the possibility of Magdallena Fontheiless being another possible heir to the estate. The status of a subordinate, unlike the traditional autonomous Armenian Jumiat was clearly reflected, as they suggested —

"One named Magdalena did sue a bill of complaint in the Mayor's Court alleging that she is legal relate of the said deceased and claiming on half moiety of the said deceased's estate ... as the said Ms. Magdalena not referring to the decision of the said arbitrators we having not empowered to order in her or against her favour therefore we do order to the said arbitrators ... after balancing the said account shall pay unto the said Zeptha Stephan or order the half part of the said estate and the other half part shall be kept by the consentment of the said administrators and the said Zeptha Stephan until the decree of the Honourable Mayor's Court."[115]

They clearly stated their disapproval of Magdalene's inheritance in the estate, particularly in the context of her remarriage. But at the same time, the decision of the Mayor's Court had by this time become binding on them.[116]

In accordance with the Mayor's Court decree of 9th June 1780, the tribunal and the administrators accepted Magdalene Fontheillas as a legal heir of the estate. The court directed them to pay half of the value of the estate to Magdalena, while the other half was to remain with Zeptha.[117] Accordingly, the administrators forwarded a sum of 16,069 Pagodas as Magdalene's share of the hard cash of the estate on 18th June, 1781.[118] They also forwarded the current accounts of the estate stating the details of the credits and unsold goods to both Zeptha and Magdalena's attorneys.[119]

Magdalena however said that she was compelled to go in for litigation, as the administrators had not forwarded the proceeds from the disposal of goods or the recovery of debt since then. Nor had they provided any further inventory or account since 1781. She also claimed that the administrators had been mishandling some specific accounts.[120] Also that the administrators refused to show any of the accounts to her current husband Annabele Fontheiless and that her attorney had not been given any further accounts since 1781, even while allegedly Zeptha Stefanian's kept receiving them. She also claimed that the administrators had been charging a commission from the estate against the prevalent norms.[121]

The administrators and the members of the tribunal, in their reply and during the interrogations, asserted that the situation was entirely Magdalena's making. She had been repeatedly refusing to comply with the agreements that had been made among the heirs, the administrators and the tribunal. She had been claiming individual access to the accounts, which the tribunal refused to comply with. They also made it clear that they would not consider her current husband as authorised to demand any access to the accounts, as they had never been legally informed of the marriage. On the contrary, they would consider such interference as a breach against the agreement.[122] Shahamir Shahmirian as the leading member of the tribunal suggested that the administrators had been working to the

satisfaction of the tribunal and the current accounts of the estate had been supplied as usual. Edward Rafael is his testimonial suggested that the administrators could not continue to forward current accounts to Magdalena and her attorney, because they had refused to provide any acknowledgement in Armenian language of the previous receipts. Also they did not provide indemnification with security.[123]

Although the Armenian administrators or the tribunal had been subordinated and made to work closely with the Mayor's Court regulations, the symbolic importance of the Armenian customs and language seemed to constantly resonate in their deliberations. For example, Edward Rafael suggested that Magdalena and her attorney failed to provide the acknowledgements and indemnification because of their lack of knowledge of Armenian language and customs.[124]

What this assertion suggested was the dual endorsement of both the Mayor's Court as well as of the norms of the Armenian network. Their ability to negotiate with the East India Company regime, locally, in the late eighteenth century Indian Ocean arena, allowed the Armenians to preserve their network identity, strengthening the potentialities of its survival.

The history of the Anglo-Armenian dialogue also speaks to the history of the process of formation of the British Empire. For the most part, the nature and structure of the Empire has been understood from several vantage points, the more recent suggestion emphasizing its network like appearance. Thomas Metcalf, Sugato Bose and Tony Ballantyne suggest that the British Empire was an interconnected web like structure that functioned with the colonies connected with each other and the metropole through circulation of capital, personnel, institution and knowlegqe.[125] This exchange was facilitated by the already existing circulation networks operating in the Indian Ocean that had unified the pre-colonial Indian ocean.[126] Engseng Ho makes this point especially forcefully, when he argues that diasporic networks like the Hadramis were exceptionally significant in the process of shaping the Empire through their strong links with local powers and mercantile societies.[127] Ho adds that the British Empire itself appeared as a diaspora that operated as a network organised around important ordering principles such as the Rule of Law but also adapted to local situations.

Historians have debated whether the British Empire was a despotic imposition of the metropole or it was a complex, product of the interaction between the coloniser and the colonised or the metropole and the colonies. Peter Marshall emphasized the notion of a negotiated empire that emerged through exchanges and conciliations between the metropole and the local.[128] This was in all probability encouraged by an inherent hybridity in the nature of British overseas governance. The provisos to govern a colony not only demanded the laws employed there to be in agreement with those of England, but these also required the colonial government to formulate laws in agreement with the ethos and conditions prevalent in the colonies.[129] Philip Stern and Robert Travers have written at length on the interaction between the local populace and the early company governments in the colonies as a critical juncture in Empire formation.[130] Stern deduced that the Company government began to operate in a milieu of early modern empires where multiple, parallel or overlapping centres of power coexisted.[131] Thus the sources of the Company government's authority were derived from multiple sources ranging from imperial metropolitan charters to local treaties and grants.[132] It is in this context that the story of the Armenian interaction with the English Company government becomes especially important revealing the dialogic processes behind empire formation.

The question, however arises whether it was possible for the Armenians to influence the long term structure of the Empire? Is it reasonable to see the British Empire as a fragmented structure in contradiction to the idea of a monolithic, centralised unit? Could we consider the law that connected the disparate parts of the Empire as not imposed from the metropole, but rather as a product of information sharing and knowledge circulations by agencies like the Armenians across the span of the Empire?

Conclusion

"However an active network once frustrated always has a tendency to compensate for its losses."[133]

There is no doubt that initially, local merchants appreciated and endorsed the advantages of the Company administration and this

collaboration fed into the making of empire.[134] The Armenians utilised the Mayor's Court to find a stronger footing in the changing political and economic milieu of the Indian Ocean. They benefited by associating with the Company as brokers, suppliers and financiers. A distant but interesting reflection of the Kalantar model of Persia, in the political imagination of the Madras Armenians, suggested a strong tendency among them to approach and utilize the British state from the point of view of conventional Armenian politics.[135] The mercantile and diplomatic strength of the Armenians made their agency integral to the process of colonial state formation. This also gave them the strength to negotiate and appropriate the English state culture in ways acceptable to the interest of the community.

The exposure to the English legal institutions created anxieties in the Armenian community, but it seemed to have been strategically handled by a partial reorganisation of their self representation. The nomenclature of being Armenians within a larger sovereign fold of the British Empire, allowed them to strategically utilise the tools of the Empire while maintaining a distinct Armenian identity.

Did the alteration of the Armenian identity lead to the end of the network or did multiple alternative nodes appear with the collapse of the moral centre of New Julfa around the 1740s?[136] The British legal space offered the Armenians an alternative moral authority in the void left by the fall of New Julfa, but it did not demand a complete change of institutional culture. On the contrary, it encouraged a hybrid Anglo-Armenian subject identity to evolve. Alteration of identity or attachment to the imperial mechanisms did not necessarily involve the death of the network. It also pointed towards a survival strategy in a rapidly changing milieu, in which cultural and economic expansion became essential. To conclude, let us consider Sebouh Aslanian's seminal work on the Santa Catharina ship capture and the ensuing legal proceedings in the court of admiralty in England. Aslanian suggests that the Armenians battled with a far more organised British system in this case. With the collapse of the New Julfan node, the Armenian litigants in London were completely dependent on the support coming from other European and Indian peripheral centres like Amsterdam or Calcutta. Armenians lost the

case due to their inability to produce the requisite attestations from New Julfan institutions, which Sebouh Aslanian sees as the portent of the death of the network.[137] The conclusion of the case divulged the importance of the exchange and circulation of knowledge. English institutions had been well informed regarding the Armenian customary practices because they identified the loophole in the attestation policy. But at the same time the Armenians travelling from India utilised their knowledge of the English law.[138] It was this exchange and formulation of knowledge systems that constructed the Imperial space, which originated from the dialogue and adjustments in institutions like the Mayor's Court of Madras but the circulation of knowledge also allowed the network to manoeuvre its survival strategies in the world of the British Empire.

Notes

[1] Braudel, *Civilization and Capitalism,* p. 163.

[2] See Panossian, *The Armenians: From Kings and Priests to Merchants and Commissars,* pp. 78-80. The city of Julfa used to be the centre of Armenian commerce as the node of the east-west land route. In 1604 in the course of his tussle with the Ottomans, Persian emperor Shah Abbas forcefully shifted a section of the Julfan merchants to a new town called New Julfa or Nor Jughai near Isfahan. His intention was to reap the benefits of the Armenian commerce.

[3] Moreland and Geyl, *The Remonstrantie or Jahangir's India,* p. 16.

[4] See Chaudhury, "Khodja Wazid in Bengal trade and politics", and Bhattacharya, "Armenian European Relationship in India, 1500-1800".

[5] For instance Jemima Kindersley the wife of Nathaniel Kindersley, who served as the Lt. Col. of Bengal between 1768 and 1769, saw the Armenians as *Gomastahs* or working for salary or commission, suggesting that their independent commerce had declined by then. See Nair, *Calcutta in the eighteenth century,* p.144.

[6] Blair B. Kling, *Partner in Empire,* p.2

[7] Mattison Mines, Courts of Law, p. 33-34. His concept of self-representation in history provides an exposure to the dialogic process and shows how an individual or group fits or negotiates within a set of conditions and relations. Self-representation is a reply that forms the dialogic heteroglossia that characterize the given society.

[8] Cohen, "Cultural strategies in the organization of trading diasporas", Pp.266-81. He says- "A diaspora of this kind is distinct as a type of social grouping in its culture and structure. Its members are culturally distinct. . . from the society among which they live. Its organization combines stability of structure but allows a high degree of mobility of personnel... It has an

informal political organization of its own ... It tends to be autonomous in its judicial organization ... Its members form a moral community."

[9] Curtin, *Cross Cultural Trade in World History,* pp. 179-206.

[10] Baladouni & Makepeace, *Armenian merchants* of *the seventeenth and early eighteenth centuries,* pp.11-12.

[11] Aslanian, *From the Indian Ocean to the Mediterranean,* pp. 13-22.

[12] Aslanian. *From the Indian Ocean to the Mediterranean,* pp. 166-201 and Markovits, *The Global World* of *Indian Ocean Merchants,* p.2.

[13] Bhattacharya, Commercial networks, Trust and regimes of circulation, pp. 546-547.

[14] Chaudhury, Trading networks in a traditional diaspora, pp. 68-69.

[15] See Aslanian, *'From the Indian Ocean', pp.* 121-122. He suggests that schematically Commenda was a commercial contract. One of the parties (the senior one normally) would provide capital, credit or goods to the other (the junior agent) who would conduct the business, normally by travelling, for the senior partner or master. Profit was divided between the two according to contract. Losses under certain condition were borne entirely by the senior or the master. Information exchange and trust on the commenda agent was rather essential for a fruitful completion of a commenda contract. Aslanian says that these commenda agents or factors who travelled for their Khoja patrons formed the functional structure of Julfan commerce.

[16] See Khatchikian, The Ledger of the Merchant Hovhannes Joughayetsi, p.125 and Fryer, A *New Account* of *East India and Persia,* p. 249 and Bhattacharya, Commercial networks, p. 548.

[17] Bhattacharya, "Commercial networks", pp. 547-549.

[18] Mentz, "The Armenian Diaspora in the Indian Ocean", pp. 584-585.

[19] Gambetta, *Trust: Making and Breaking of cooperative relations,* pp. 217. "Trust...is a particular level of subjective probability with which an agent assesses that another agent or group of agents will perform a particular action, both before he can monitor such action ... and in a context in which it affects his own action." He also suggests that according to this understanding when someone is considered trustworthy, it is expected that he or she will be beneficial.

[20] Aslanian, "The salt in a merchant's letter" pp. 150-154.

[21] Khatchikian, "The Ledger of the Merchant Hovhannes Joughayetsi", p. 148.

[22] *Ibid.pp. 148-149*.

[23] Aslanian, *From the Indian Ocean.* Pp. 181-183.

[24] Aslanian, "Some notes on a letter sent from an Armenian Priest in Bengal in 1727", pp. 424-25, para-6 & 7. "There was a big discord in between Paron Tarkhan and Paron Nazar, and I have notified the late Movses about this ... This same Paron Tarkhan and Paron Nazar had settled their accounts between them and drafted a contract. They called me and I sealed the document in their presence, testifying that Paron Nazar had written a sanad of forty-five thousand tomans and given it to Paron Tarkhan with a time period of one year in order for Paron Tarkhan to give him back his commenda contract and take his money. In this fashion, they both agreed to have a severance

from each other, but later Paron Tarkhan changed his mind, saying that I have claims on this person [Nazar]. Because of this discord, matters stood like this. This year, Paron Nazar took his money and gave it to the English Company, saying that I have given that man a sanad, let this money stay here and let him bring my commenda contract and take his money. The head of the English company called me and made an investigation as to whether they had settled their accounts and drafted farkhati and he told Paron Tarkhan that you have settled this account and have no claims on Paron Nazar. Your money is at the court of our company, and we shall keep it at our court until you bring Paron Nazar's commenda contract and all you three brothers are present in this place and take your money. The money stayed at the court."

[25] *Ibid,* p. 391.

[26] Tzanakis, "Social capital in Bourdieu's, Coleman's and Putnam's theory", p. 6. The term social capital may be used to define the aggregate of social institutions, networks and norms that makes a society productive and reduces the risk in the transactions among them. Therefore, the strength of social capital also ensures the preservation of trust.

[27] Aslanian, *From the Indian Ocean,* p. 174.

[28] Poghosyan, *Datastanagirkh Astrakhani Hayots,* pp. v-cxxiii,

[29] Aslanian, "The salt." p. 145. & Khatchikian, "The ledger", p.125.

[30] Poqhosyan, *Datastanagirkh,* pp. lxii-lxiv.

[31] Aslanian. *From the Indian Ocean,* pp. 170-171.

[32] *Ibid.* p. 211-214.

[33] Mentz, "The Armenian diaspora in the Indian Ocean", p. 591.

[34] Bhattacharya, "Armenian merchant networks", p. 567.

[35] Burt, "Structural Holes Versus Network Closure as Social Capital," pp. 31-56.

[36] Stern, *The Company-State,* pp. 173-177.

[37] Pratt, *Imperial Eyes: Travel Writing and Transculturation,* pp. 6-7. Contact zone is a junction where disparate groups came into contact with each other and often interacted within a milieu of unequal relation of power that led to exchange of information in moments of colonial encounters.

[38] Mines, "Courts of Law", P. 34.

[39] Mines, "Courts of law", p. 41.

[40] Madras Record Office (MRO)Records of Fort Saint George, *Letters to Fort Saint George,* 1692, p. 201.

[41] Wheeler, *A History* of *The English Settlements in India,* pp. 92-93.

[42] Mines, "Courts of law", p. 41.

[43] Banerjee, *English Law in India,* pp.10-11.

[44] Brimnes, "Beyond Colonial Law", pp. 526; 531.He noted that between 1780 and 1791, almost 34% of the cases brought to the court were between Indians.

[45] Mukund, *The View from Below,* p. 28.

[46] Arasaratnam, *Merchants, Companies and Commerce on the Coromandel Coast,* pp. 274-275.

[47] Mukund, *The view from below,* pp. 29-30.
[48] Banerjee, *English Law,* p. 11.
[49] Brimnes, "Beyond Colonial Law", p. 526.
[50] Mukund, *The view from below,* p. 42.
[51] Brimnes, "Beyond Colonial law", pp. 519-520.
[52] *Ibid.* p. 515.
[53] Tamil Nadu State Archives (TNSA), *Public Department Sundries*, vol.8, Form and Method of Proceedings in all Civil Suits, 1726.P. 110." It is recommended to the chairman to make honourable mention of the English Government and law that as subjects of Great Britain and Ireland are governed by. .. it will be proper to enlarge upon His Majesty's princely goodness ... to extend his care and benefit of his laws to his most distant subjects of the British settlements in East Indies."
[54] TNSA, *Public Department Sundries*, vol. 8. p. 2. "The Complaint with us in England is called a Bill of complaint and by reasons of the multiplicity and variety of cases in this place is no capable of being limited to any particular form".
[55] Ibid. p.109. "If a person who is not natural born subject of Great Britain or born of British parentage in India, a Portuguese, Gentue or other native of India-not born of British parents happens to be prosecuted for any capital offence, the jury is to consist one half of his majesty's subjects and the other half of the subject of the same caste and if a number of six cannot be found who are fellow subjects ... then they must not be made of any foreign subjects ..."
[56] Subramanian, "Seths and Sahibs: Negotiated relationships between indigenous capital and the East India Company", pp. 311, 313, 315.She suggests that the operations of the Mayor's Court of Bombay were constrained by local factors; especially the merchant notables often influenced the court regulations.
[57] Wilson, *The Early Annals of the English in Bengal, vol.* 1, p. 200.
[58] See Wilson, *The Early Annals of the English in Bengal Vol.* 2 *part 2.*
[59] MRO, *Records of Fort St. George, Minutes, Proceedings in the Mayor's Court of Madrasapatnam* (1689-1719), Pp. 13-15, 15, 19, 22, 29, 31-32, 33, 36, 38-39, 40-42, 56.
[60] *Ibid.* p. 91. See how Khoja Simone, Khoja Louize, Khachik Gregor and Khoja Necos were asked to referee cases involving Armenians.
[61] Love, *Vestiges of Old Madras 1640-1800,* vol.1, p. 495.
[62] Subramanian, Seths and Sahibs, p. 316 She cites the example of the Bania community, who utilised their financial strength to exert influence on the emerging colonial regime.She suggests that the capacity to influence the colonial system depended on the bargaining power of specific interest groups.
[63] Santanu Sengupta, Rethinking the Network: Armenians in 17th-18th Century Bay of Bengal (Unpublished M. Phil dissertation, Centre for Studies in Social Sciences, Calcutta, 2012) pp. 38-39.
[64] Aslanian, "Trade diaspora versus colonial state", p. 50.
[65] Baladouni and Makepeace, *Armenian traders. Pp. 86-89. Court* Minutes, 22 June 1688, *8/39* pp. 1338-135A.

[66] MRO, Records of Fort Saint George, *Diary and Consultation Book* of *1707,* p.61.& for information on the caste conflicts see Love, *Vestiges* of *Old Madras* vol.1. pp. 559-560 & voI.2.pp. 25-28. This provided them with more leverage to engage with the system. In 1707, after bouts of conflict between the right and left hand castes in Madras, a body of Armenians assisted by Pathans and Persians were engaged to find a suitable solution as the council felt that it was not able to mediate properly.

[67] MRO, Records of Fort Saint George, Diary and Consultation Book (Public Department) 1754, p.XII "We apprehend that this exclusion of the natives from all manner of redress when any disputes do happen amongst them, is a very great prejudice to all other inhabitants ... The construction which has hitherto been put upon this clause has reached only to an exclusion of the Mahometans and Pagans against each other ... but the definition of Indian natives may nevertheless at all times be liable to contests and disputes, as it may often be difficult, if not impossible to prove whether many persons who may apply to us for justice are or not are natives, since much the greatest part of those who vulgarly called ... Armenians etc are natives of this country as much as the Mahomematans and Pagans and as persons of these last professions do sometimes become Christian, yet nevertheless, an Incongruity will rise ... We offer it as our opinion that no persons of whatever denomination, profession or country, living under the protection of the Company should be denied the liberty of applying to publick justice ...".

[68] Paul, *The legal profession in colonial South India,* p.12.

[69] Mines, "Courts of law", p. 37.

[70] *Ibid.* p. 40-46.

[71] TNSA, *Public Department Sundries,* vol.8. Pp. 4-5.

[72] *Ibid.*

[73] TNSA, *Pleadings in Mayor's Court,* vo1.24, General no. 12019. Pp. 9-49.

[74] TNSA, *Pleadings in Mayor's Court,* vo1.24, General no. 12019. P.23. Pogos the complainant initially proposed as advised by the Mayor, "... to choose arbitration in the court of the Armenians, Gujarat, Moors merchants ... any other castes or lots of merchants except Mallabarean in order to settle the dispute ..."

[75] TNSA, *Pubic Dept. Sundries.* Vol. 8, pp. 2-3. "The complaints require the mentioning of the place of residence of both complainant and the defendant. If the party against whom the cause of complaint is, does not live or reside within the jurisdictions of the court at the time when bill is filed or exhibited but did so *when the cause of the occurred".*

[76] TNSA, *Pleadings at the Mayor's Court,* vo1.23, 9th January 1770-27th November 1770; Gl.no. 12018. For example in December 1769, Arathoon Khatchatoor an Armenian from Pegu filed a case against Marappamaloo, a merchant from Madras, for an unfulfilled repayment of 135 Pounds and 4 Shillings that Khatchatoor had lent during his stay in Madras.

[77] TNSA, *Public Department Sundries,* vol.8. p. 31. "In the process of the examination if any witness refuses or neglects to appear upon oath made

of the service of the summons, the court may commit the party to prison till he shall satisfy the court..."

[78] *Ibid.* pp. 41-45.

[79] *Ibid.* p. 55. "But it may so happen that the defendant may withdraw himself from the jurisdiction of the court ... possibly on purpose to elude the justice ... in which case then would have been a failure of justice ... it may be necessary just to give the form of such a sequestration as should issue upon this occasion ..."

[80] Benton, *Law and Colonial Cultures,* pp. 257-258.

[81] TNSA, *Pleadings in the Mayor's Court,* Vol. 1, GL 11996, p. 154. For example in a suit filed in 1731 by Khoja Zachariah against Khoja Amouner, the court thought that the matter was exclusively related to Armenian customs. "... it appearing that the matters in question between the plaintiff and the defendant depended on the customs of the Armenian merchants .. .it is therefore ordered the several matters and accounts ... are hereby referred to Coja Pacedon, Coja David and Coja Gregoris ... award made by the arbitrators be final ..."

[82] Arasaratnam, Merchants, Companies, p. 286. "In the indigenous legal system much of the litigation was settled through arbitration either by the heads of castes or by people chosen by the parties to the dispute ... From the early stages the mayor's Court sought to build this practice of arbitration into its procedures, but it did so with abruptness and an absence of conciliation, and thus aroused hostility."

[83] MRO, *Records of Fort St. George, Pleadings at the Mayor's Court.* 1745. *Vol.* 5. Pp. 49-73.

[84] *Ibid.* p. 50 "These differences in a course of a long account, in large sums of money makes the balance of accounts betwixt us very unequal and to adjust which your orator has frequently in a most friendly manner desired to refer the said accounts to 4 of your Orators Nation even indifferently Chosen by himself. But he will neither go to arbitration without compulsion, nor pay your orator his balance ..."

[85] *Ibid.* p. 57. "... tho' it is impossible this article can be made clear to this honourable court by any other means than that of referees to inspect and compare the said goods with others of the like sort, overcharged by an account under the defendants own hand in the Armenian language ..."

[86] *Ibid.* p. 62.

[87] MRO, Records of Fort St. George, Pleadings at the Mayor's Court. 1745. Vol. 5.; P. 50. The plaintiff in his petition repeatedly invoked the idea of friendship, goodwill and betrayal; he wrote- "... did sell the same for him in Manilla besides others sent therewith to the amount of 4700 dollars in consideration of which Friendly terms, but contrary to such his promise he now charges commission which your orator refuses ..."

[88] TNSA, *Pleadings in the Mayor's Court,* vol. 23. GI: 12018. Pp.128-145. In the proceedings regarding a law suit filed by Aratoon Thadeus Agah Piry Calendar (Sic), an Armenian merchant against Vemum Veeropah, a Chintz supplier, the process of subjecting the indigenous courts to regulation was

clearly visible. The Court continued to acknowledge the indigenous centres of arbitration. But at the same time the poise of supremacy that could legitimise a legal culture made the Mayor's Court the centre of power in the paradigm of law and jurisprudence in late eighteenth century Madras.

[89] TNSA, *Pleadings in the Mayor's Court,* vo1.23. pp. 138-139. The following excerpt from the will of Joseph the son of Maruth will illustrate the practice- *"Moreover five hundred rupees are to be sent to Holy Egmiasun and five hundred rupees to the convent at Holy Jerusalem, three hundred rupees to the convent at Aminapurkich at our Julpha, two hundred rupees to the convent* of *the Numse at our Julpha, two hundred rupees to our church at Purtvee ..."*

[90] TNSA, *Madras Mayor's Court : Wills, probates and Letters of Administration* (1786), vol. 36, GL 12130 p.94. The following excerpt from will of Johaness the son of Goolamer will give us an idea of the practice- *"Four Hundred Rupees must be remitted to Astrakhan to Mr. David the son* of *Dabat Thomas ... a ring to be made and wear it for my remembrance ..."*

[91] TNSA, *Mayor's Court : Wills, probates and Letters of Administration* (1784) vot. 32, GL 12128 pp. 218-225.

[92] TNSA, *Mayor's Court : Wills and Probates and Letters of Administration, (1789).vol. 37.GL.12133. Pp. 45-46.*

[93] Poghosyan,. *Datastangirkh,* pp. 52-70.

[94] TNSA, *Public Department Sundries,* vol.8, 1726. Pp. 125-126.

[95] *lbid.* p. 116. The evidence requisite to satisfy the court of what the testator intended and what he did not is not to be reduced to a certainty by any particular rules, but as it will generally depend on the circumstances of the case it must be left to discretion and what the court is induced to believe from these circumstances is to direct their judgement."

[96] *Ibid.* p. 145.

[97] *Ibid.* p.145 "The court upon any grant of an administration is to take bond with securities .. part of the obligations of which is that all the rest and residue of the estate which shall be found remaining upon account the administrator shall deliver and pay unto such persons respectively as shall be entitled thereunto accordingly the court after they have called the administrator to account may order a distribution of what does remain debts, and other just expenses ... residue one third to the wife and among children ... no representatives shall be admitted among collaterals after brothers and sisters' children ... No distribution of this type till one year everyone receiving a share must give bond with sureties in the said court that if debts afterwards be made he shall refund his part thereof administrator's charges."

[98] TNSA, *Mayors' Court Wills 1784*, vol. 32.p. 123

[99] *Datastangirkh* p. 69.

[100] TNSA, *Mayor's Court Will 1784,* vol. 32. P. 124. "The said opponents further by their proctor say and alleged that they did not intrude themselves under any false colour or pretences upon the estate and effects of the said Johaness Benedict; on the contrary their administration to the said estate was at the particular desire and request not only of the widow relations and creditor

of the said Johaness Benedict but of the most principal merchants residing at Madraspatnam ..."

[101] TNSA, Wills 1784, vol. 32. P. 124.

[102] Ibid.p.125 " ... further say that they have delivered into this honourable court, a true and perfect inventory of the estate & effects of the said Johaness Benedict that have come to their hands, possession & knowledge and they have also delivered into the registry of the King's Ordinary in this honourable court two accounts current of their several transactions and what remains outstanding they by leave of this Honourable court now pray to annex ..."

[103] Ibid. p. 137.

[104] Ibid. p. 138.

[105] Ibid. p. 126 "Proctor further say and as they are advised, why they cannot consent to their letter of administration being revoked and annulled, that they have legally obtained the said letters of administration in the first place whereby they have gained a credit among the several merchants having dealings with the said Johaness Benedict ..."

[106] 106 Ibid. P 194 and P. 212.

[107] *Wills and Probates*, 1787, vol. 35, GI. P. 193

[108] Ibid.

[109] Ibid. p. 194.

[110] Ibid. p.195.

[111] Ibid. Exhibit A.

[112] Ibid. Exhibit A "They said Mess. Sett Aviet and Sanad Coja Maul administrators of the said estate shall keep in their custody out of the said estate the sum of 1000 pagodas for the term of two years until they hear from the sovereign Lord Senior Patriarch of all the Armenian nation to pay the expenses if made by these European paper makers engaged now proceeded from Vagarshapat to Europe. If the said expenses consisting 1000 pagodas shall pay His Reverendship or order if less or nothing shall return the said sum into the heir of the deceased."

[113] Ibid. Exhibit A; point. 08.

[114] *Datastangirkh*, pp. 203-205

[115] *Wills and Probates* 1787, Exhibit A; Point 08.

[116] Ibid.

[117] Ibid. p. 194.

[118] Ibid. p. 210.

[119] Ibid.

[120] Ibid. pp.212-225.

[121] Ibid.

[122] Ibid. pp. 270-300

[123] Ibid. pp. 303-350.

[124] Ibid. p. 308. "That they wanted the said Miguel Johaness to give them a receipt or discharge in the Armenian language in like manner as the said Joseph Maroot had given on the part and behalf of the said Zeptha Stephan to which the said Miguel Johaness replied that as he did not fully understand the form that would be necessary in the Armenian language and did not

know what kind of receipt or discharge had been given by the said Joseph Maroot..."

[125] Metcalf, *Imperial Connections, P. 7.* Also see Sugato Bose, *A Hundred Horizons.*

[126] Chaudhuri, *Trade and Civilisation in Indian Ocean,* pp. 4-5.

[127] Ho, "Empire through Diasporic Eyes", p. 212.

[128] Marshall, *The Making and Unmaking of Empires,* p. 272.

[129] Macmillan, "Imperial constitutions: sovereignty and law in the British Atlantic" pp. 72, 75.

[130] See Stern, "*Company, state and empire: governance and regulatory frameworks in Asia*" and Robert Travers, "Constitutions, contact zones and imperial ricochets: sovereignty and law in British Asia".

[131] Stern, *Company State* P. 13.

[132] *Ibid.*

[133] Braudel, *Civilization and Capitalism. 164.*

[134] Subramanian, Seths and Sahibs.P. 318.

[135] Herzig, The Commercial Law, pp.66-67. Kalantar/Kalanthar was the community chief in New Julfa, elected by the community settled there. They played the crucial role of negotiating regarding their rights, taxation etc. with the Shah of Iran who was seen as a sovereign power. It could be compared with the accounts of Khodja Wajid and Petrus Arathoon. They were selected by the community to represent their interest to the Nawabi and the Company government respectively.

[136] Aslanian, *From the Indian Ocean*; pp. 203-204, 210. He says that the collapse of Julfa in the 1740s and a rapid exodus towards Mediterranean, Asian and European settlements. The activities being now concentrated on the multiple nodal centres pushes us towards thinking of multiple worldviews.

[137] Aslanian, "Diaspora vs. Colonial state", p. 82.

[138] Emin, *The life and adventures of Joseph Emin,* pp.16-17.

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PANGURARIA (SARU-MARU) REVISITED : REDEFINING THE BOUNDARY OF THE AŚOKAN EMPIRE*

SMITA HALDER

The early historic archaeological site of Panguraria (Pāṅguḍāriyāṁ; 22°43′ N and 77°43′ E) or Saru-Maru is situated in the Budhni Tahsil of Sehore District in the present state of Madhya Pradesh in a forest unit named after the village (Panguraria).

Figure 1 - Road Direction to Saru-Maru by Madhya Pradesh Tourism.

It is a Buddhist monastic site which has developed centering a hill named Saro-Maro or Saru-Maru in which inscription of the Mauryan king Aśoka is engraved in a rock-shelter on a slope at the southern side of the Vindhyan range. The rock-shelter which bears the inscription of Aśoka is on the second platform from below and has some *stūpas* in front of it (Fig. 2-3).

D. C. Sircar has given a detailed description of locale of the site of Panguraria (Sircar 1979, 94). The rock-shelter is located at a height of 21m. from the ground at the foot of the hill Saru-Maru which is about

* The article is an outcome of the ongoing research project in Indology in The Asiatic Society, Kolkata under the title of "Exploring the Early Historic Malwa : Looking beyond the cities and Trade Routes".

304 m. above the sea level and the slopes gradually down to the river Narmada. At the bottom of the hill, there is remaining of a large *stūpa* of about 65m. in diameter (Fig. 4). On the way to uphill there are many more ruined construction of *stūpas* and *vihāras.* There were about thirty monasteries constructed on stone platforms at the site (Sircar 1979) (Fig. 5-10). Interestingly, the site has more rock-shelters to the north side of the hill and these shelters have a number of rock-paintings on the back wall as well as on the ceiling. The condition of the rock paintings is bad and almost destroyed by weathering and human vandalism. Sircar did not mention about the rock-paintings of the Saru-Maru hills (Fig. 11-16).

The Hosangabad-Sehore area is known for pre-historic rock-paintings. Besides the popular sites of Bhimbetka and Adamgarh, there are a number of other lesser-known sites which have similar kind of rock paintings (Fig. 17-27). In *Rock Art of Madhya Pradesh* published by the Madhya Pradesh Tourism[1] it is mentioned that Sehore district has several rock shelters among which the Panguraria, Talpura and Kathotia are major sites. Among these, the first two are protected monuments by Archaeological Survey of India (henceforth ASI) and also bear the ruins of Buddhist monuments (*stūpa* and monastery). Panguraria is off the Budhni-Rehati road and was discovered by ASI in the mid of 1970s. Rock paintings at Saru-Maru are in bad condition and most of them are faded away. The paintings include the Buddhist iconography along with more archaic paintings of the scenes of hunting, horsemen wielding spear, wild animals, etc. painted in red, white and yellow colours. All these paintings are of historical period but the paintings from Talpura are of Chalcolithic time. While the shelters are one or two in number in these two sites, at Kathotia there are almost sixty rock-shelters. To understand the early historic Malwa, Saru-Maru becomes imperative among the above mentioned sites due to its affiliation with the Aśokan edicts on one hand and the early Buddhist settlement on the other.

The geographical location of the site is interesting and needs a fresh study, but we have a little scope to study the landscape in this article. Before going into details of the Panguraria inscription, we

would like to discuss the Aśokan inscriptions in central India and Deccan in brief.

The first ever deciphered epigraph of the subcontinent is the set of the Mauryan inscriptions and particularly those of the Mauryan emperor Aśoka. It is well known that the Aśokan inscriptions are usually written on two types of materials – movable stone pillars and living rocks (Smith 2016). Besides, there is a third category – the cave inscriptions including manmade and rock-shelters[2]. However, a fourth category of writing medium could be traced i.e. the stone slabs. There are about five Aśokan inscriptions which are engraved on stone slabs like – the Calcutta-Bairat edict, Kandahar Greek Edict, Sannati edict, Sopara edict, and the one reported from Ghuggus (Shastri 1997-98). Aśokan edicts attract the attention of the scholars of early India and open various aspects of study since its discovery. Among all other issues, the distribution pattern of the inscriptions is an interesting one. In this article some observations on the Aśokan edicts found from central India and Deccan have been taken into consideration. The observations lead us to a few questions which have no proper solution yet. A further research on the issue could be carried out to get the answers of the questions in future.

First, we would look at the sites and content of the inscriptions of the taken geographical limit i.e. Madhya Pradesh, Maharashtra, Karnataka and Andhra Pradesh in brief. A table, followed by a map, has been made to understand the find-spots of the Aśokan edicts in central India and Deccan.

The Aśokan Inscriptions from Central India and Deccan :

Sl. No.	Inscription from	Type of Inscription
1.	Rupnath, Jabalpur District, Madhya Pradesh (Hultzsch 1995)	Minor Rock Edict I[3]
2.	Gujarra, Datia District, Madhya Pradesh (Sircar 2000)	Minor Rock Edict I
3.	Saru-Maru (Panguraria), Sehore District, Madhya Pradesh (Sircar 2000, 95-103)	Minor Rock Edict I

Cont. p. 108

Sl. No.	Inscription from	Type of Inscription
4.	Sanchi, Raisen District, Madhya Pradesh (Sircar 1965, 71)	Minor Pillar Edict/ Schism Pillar Edict[4]
5.	Deotek Slab Inscription, Maharashtra (Mirashi 1960, 109-117; Mirashi 1963, 1-4)	Unknown variety[5]
6.	Ghuggus Inscription, Chandrapur District, Maharashtra (Shastri 1997-98, 55-58)	Minor Rock Edict[6]
7.	Sopara, Palghar District, Maharashtra (Talim 2010, 69-76)	Fragmented Rock Inscription VIII and IX
8.	Amaravati, Guntur District, Andhra Pradesh (Sircar 2000, 118-122; Falk 2006, 226)	Fragmented Minor Pillar Inscription of an unknown variety
9.	Rajula Mandagiri, Kurnool District, Andhra Pradesh (Talim 2010, 200-208)	Minor Rock Edict I and II[7]
10.	Erragudi, Kurnool District, Andhra Pradesh (Sircar 2000, 1-41)	Minor Rock Edict I and II Major Rock Edict I to XIV
11.	Nittur, Tumkur District, Karnataka (Basu Majumdar 2016, 31-33)	Minor Rock Edict I and II
12.	Udegolam, Bellary District, Karnataka (Basu Majumdar 2016, 31, 34-35)	Minor Rock Edict I and II
13.	Maski, Raichur District, Karnataka (Basu Majumdar 2016, 28-30)	Minor Rock Edict I
14.	Gavimath, Koppal District, Karnataka (Basu Majumdar 2016, 36-38)	Minor Rock Edict I
15.	Palkigundu, Koppal District, Karnataka (Basu Majumdar 2016, 36, 39-42)	Minor Rock Edict I
16.	Brahmagiri, Chitradurga District, Karnataka (Basu Majumdar 2016, 43-44, 47- 48)	Minor Rock edict I and II
17.	Jatinga Rameshwara, Chitradurga District, Karnataka (Basu Majumdar 2016, 43-46)	Minor Rock Edict I and II
18.	Siddapura, Chitradurga District, Karnataka (Basu Majumdar 2016, 43, 49-51)	Minor Rock Edict I and II
19.	Sannati, Gulbarga District, Karnataka (Basu Majumdar 2016, 18-27)	Rock Edict XII Rock Edict XIV Two Separate Edicts

Map: Find-spots of some of the Aśokan edicts

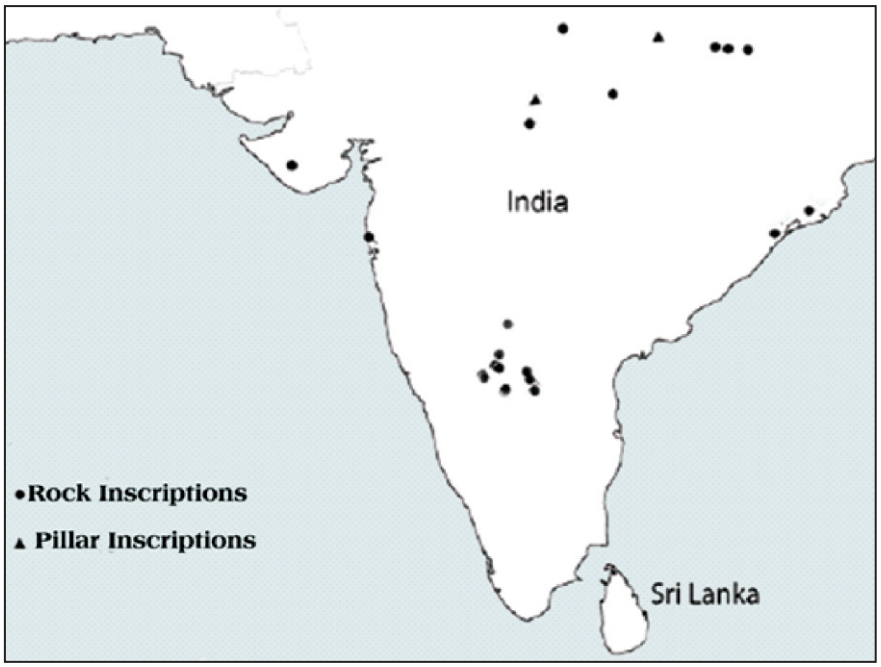

Figure 2 : *Stūpa* and monastic remains in front of the rock-shelter consisting of the Aśokan edict.

Figure 3 : Towards Saru-Maru caves and monastic settlements.

Figure 4 : The rock-shelter bearing the Aśokan edict at Saru-Maru.

Figure 5 : Remains of a large *stūpa* at the bottom of the hill.

Figure 6-10 : *Stūpa* and monastic remains scattered at Saru-Maru.

Figure 7.

Figure 8.

Figure 9.

Figure 10.

Figure 11-16 : Rock-shelters and paintings at Saru-Maru.

Figure 12.

Figure 13.

Figure 14.

Figure 15.

Figure 16.

Figure 17-20: Rock-shelters and paintings at Talpura.

Figure 18.

Figure 19.

Figure 20.

Figure 21: Monastic remains at Talpura.

Figure 22-25 : Rock-shelter and paintings from Bhimbetka.

Figure 23.

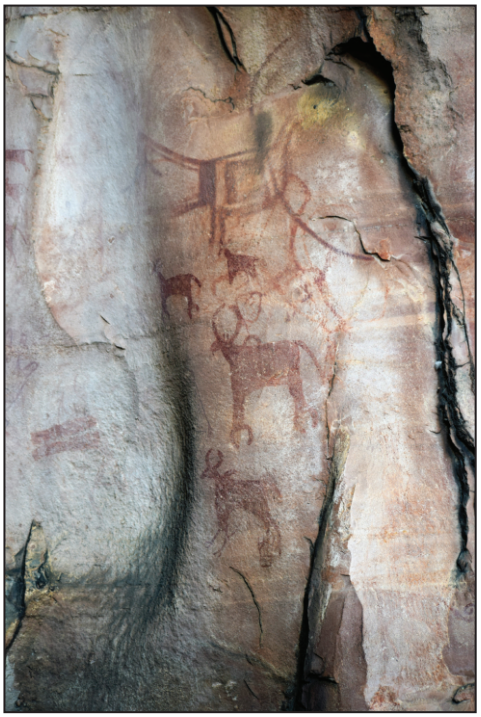

Figure 24.

Figure 25.

Figure 26-27: Rock-paintings from Adamgarh.

Figure 27.

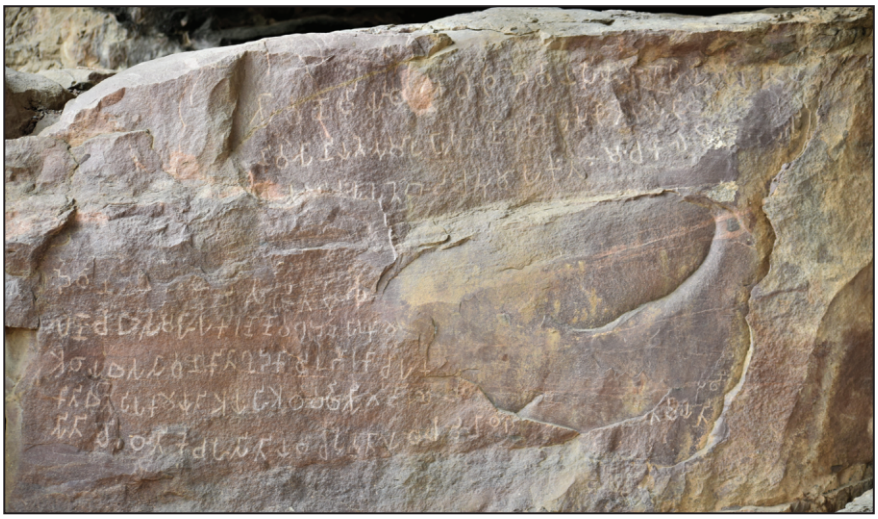

Figure 28: Aśokan Edict from Saru-Maru (1A and 1B).

Figure 29: Aśokan Edict from Saru-Maru (1C)

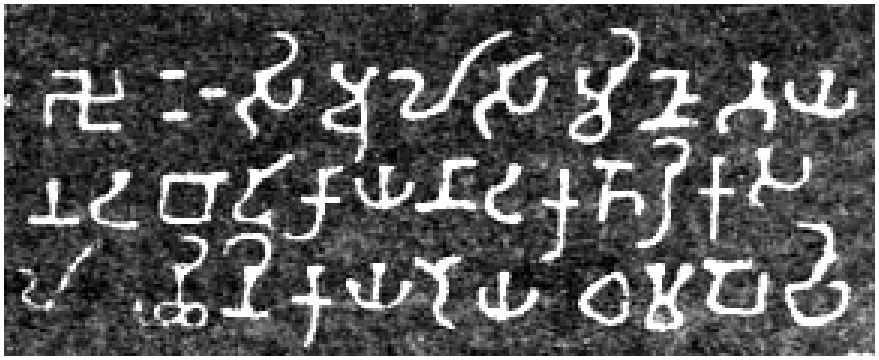

Figure 30: Junnar inscription of Isimulasāmi (Photo Courtesy: Burgess 1994, XLIX-14).

Figure 31: Naneghat cave bearing the inscription of the Kumāras.

Figure 32: Inscription of *Mahākṣatrapa Kumāra* Rupiaṁma from Pauni
(Photo courtesy: Mirashi 1969).

Though Saru-Maru bears the MRE-I, the version of the inscription is somewhat different than rest of the MRE-I(s) found from other sites. Sircar has taken it as the western version of MRE-I (Sircar 1979). Here we would revisit the inscription and discuss some of the issues of the Aśokan edicts of the locale along with other neighbouring ones.

There are four sites from Madhya Pradesh which have been reported so far bearing inscriptions of Aśoka, like – Sanchi in the Raisen district, Gujarra in Datia district, Rupnath in Jabalpur district and the present one i.e. Saru-Maru or Panguraria in Sehore district. All the sites except the Sanchi bear the Minor Rock Edict I, and Sanchi has a Minor Pillar Edict or Schism Pillar Edict while all the four places are associated with religious sites – either of Buddhist or Brahmanical faiths.

Saru-Maru or Panguraria MRE-I of Aśoka:

It is already mentioned above that the inscription is engraved on a slope of a rock-shelter in the Saru-Maru hill. The shelter has an overhanging stone serving as a roof for the shelter and an uneven vertical back wall that has been broken horizontally into two parts due to weathering. The inscription, unlike the other Aśokan edicts, is divided into three parts. The main text is engraved into two parts while there is an extra section engraved in comparatively large characters than the principal inscription. We have numbered the three parts of the inscriptions as 1A, 1B (Fig. 28) and 1C (Fig. 29) respectively for easy understanding.

1A and 1B are written on a section of the lower half of the back wall. The stone selected for engraving the text is of an uneven surface. 1A is engraved leaving considerable space at the left margin due to unsuitability for engraving. It consists three lines while the next part i.e. 1B has five lines. Unfortunately complete right half of the line 4-6 and extensive part of the right half of the line 7-8 is peeled off. 1C is written in comparatively large characters in five lines. It is incised on the upper half of the wall and the last line is almost peeled off.

According to the reading and translation given by D. C. Sircar in his *Aśokan Studies* it was issued for *Kumāra* Śaṁva during Aśoka's tour of 256 nights. Sircar has given the reading of the inscription in his *Aśokan Studies*. Sircar has shown that the language used in this inscription is not usual *Māgadhī* as seen in the other versions of MRE

I. The edict is also different from all Aśokan inscriptions as it has an introductory part unlike any other edicts of the ruler. The text and translation of the introductory part (i.e. 1C) according to Sircar is as follows –

1. *Piyadasi-nāma*
2. *rājā Kumāra[sa]*
3. *Saṁvasa Māṇe*
4. *ma-dese [U or O]punitha-*
5. *vihāra- [ya]tāy[e]*

"(I) The king named Priyadarśin [speaks] to *Kumāra* Sāṁva from [his] march [of pilgrimage] to the Upunitha-vihāra (or Opunitha-vihāra) in Māṇema-deśa." …

We would like to mention here that in the word *Upunitha,* the *ni* is clearly cerebral (i.e. *ṇi*) and the last line is fully damaged except a letter *yā* [8] and it seems that the place before *yā* is not sufficient for five more letters. Thus, reading of the last line given by Sircar is not unquestionable. Meena Talim in her book (Talim 2010, 194-199) gives a little different reading where she has read *nāme* in line one instead of *nāma*, *Saṁvāsa* and *Māne* in line three instead of *Saṁvasa* and *Māṇe*[9]. Her translation of the inscription is different from that of by Sircar. Talim translates it as follows – "King named Piyadassi, was living with prince. He the young man, was sent to Majjima country, sojourning the pilgrimage." She has made a Pāli version of the inscription first and then converted that into English.

Sircar takes the term *Kumāra* as a "scion of his family and probably not a son of his" own who was the local governor (Sircar 1979, 97). Interestingly, presence of *Kumāras* is also noticeable in Tosalī, Ujjayinī, and probably at Takṣaśilā as mentioned by Sircar. Though the term *Kumāra* usually refers to 'a son' but in the context of early historic Deccan, the term is significantly indicates to a different group of people. Thus, it becomes necessary to rethink about the use of the term in Narmada basin area as both Deccan and Central India were culturally and politically contagious regions in early historic time.

There are a number of post-Mauryan coins found from Deccan mainly in Karhad region issued by the Kumāras. Shailendra Bhandare

for the first time identified them as a ruling dynasty of the locality of Karhad in his unpublished thesis (Bhandare 1998). Kumāra Mula, Karanalavi and Kumāra Isimula are the Kumāra rulers among whom Kumāra Isimula is also known from his numismatic issues from Junnar. An inscription from Junnar mentions Isimulasāmi (Burgess 1994, 95) who is also indentified with Kumāra Isimula by the historians (Fig. 30). There is another inscription from Mahad which is known as Pale or Gandharpale caves bearing the name of a Kumāra (Burgess 1994, 88; Burgess and Indraji 1881, 2). Presence of the Kumāras in early historic Deccan is also evident from the Naneghat large inscription (Fig. 31) (Halder 2016), Udayagiri inscription (Banerjee 1982, 161), Pauni memorial inscription (Fig. 32) (Mirashi 1969, 201-203) etc.

The numismatic evidences show that some kinds of alliances occurred between the Kumāras and the Western Kṣatrapas and as a result Isimula used the Śaka epithet - *Mahākṣatrapa* on his coins found from Junnar. The Kumāras of Deccan mingled with the Western Kṣatrapas is also evident from the inscription of *Mahākṣatrapa Kumāra* Rupiaṁma (Mirashi 1969, 201-203) which has been reported from Pauni, a neighbouring site of Narmada Basin. However, this article is not aimed to discuss the issues of the Kumāras. Therefore, the Kumāras are not discussed here in details.

It is usually believed that *Kumāras* mentioned in the Aśokan edicts were either his own sons, or they were the Mauryan princes but not the sons of Aśoka as the Delhi-Topra pillar edict mentions *dārakas* as his own son (Sircar 1979, 97) while, the term *ārya-putra* mentioned in the Suvarṇagiri province tempted the historians to take *ārya-putra* as the *yuvarāja*. Though there are different kinds of opinions regarding the *Kumāras*, it is unanimously believed that they were the provincial heads in Mauryan administration. Above discussion regarding the Kumāras in Deccan shows that in post-Mauryan time the Kumāras became a ruling group like those of the Mahāraṭhis, Mahābhojas etc. Therefore, we can infer that the Saru-Maru or Panguraria inscription also refers to an official who might not be a *rājaputra* and we would like to take the Kumāras mentioned in the Aśokan inscriptions as the important administrative officers and the Kumāras of later times were

the successors of these administrative officials who probably get their professional identity as their social status during post-Mauryan time as we get in the case of Mahāsenāpatis, Mahātalavāras etc.

Like the other Minor Rock Edicts (henceforth MRE) of Aśoka Panguraria edict also mentioned the borderers. From the rock inscriptions of Aśoka, we come to know that his neighbouring powers were the Choḷas, the Pāṇḍyas, the Keralaputras, the Satiyaputras, Tambraparni (i.e. Sri Lanka) along with the *Yavana* kings but interestingly, the MREs of Madhya Pradesh were addressed to the border-people too. Here it is noteworthy that these inscriptions were not found from border areas. Harry Falk also observed most of the MRE I sites belong to the core area of the Mauryan settlements and are difficult to approach. Twelve among sixteen MRE sites are placed on hills or connected with caves or hills (Falk 2006, 55). Falk raises the question why did Aśoka order his first text to be inscribed in caves or hills and he has shown that most of the sites were the places of social or religious gathering like *melā* or *yātrā* and were visited on certain occasions (Falk 2006). However, the principal question that has come up in our study is why did Aśoka mention or address to the border-people in the sites like Rupnath, Gujarra and Saru-Maru which are situated almost at the central territory of his empire. Mentioning the borderers in the Karnataka-Andhra Pradesh is justified as the region was the southern limit of his empire[10] but it is quite astonishing to set up inscriptions addressing the borderers almost at the central parts of his empire. Here we have tried to revisit the Aśokan epigraphs found from Madhya Pradesh and neighbouring region especially the Narmada-Vindhyan tract and Vidarbha region and have tried to address the questions which might open a fresh arena of study in future.

The above mentioned chart clearly shows that the taken geographical region contains mainly the Minor Rock Edicts and especially the MRE I. It is believed that the MREs are the earliest set of inscriptions issued by the Mauryan emperor Aśoka during his 10th regnal year. The MRE II is only available in Deccan and especially in Karnataka-Andhra Pradesh area. It seems that the MRE II was probably meant for the Deccan i.e. the southern limit of Aśokan empire only. Though the MRE II is considered as almost an appendix and an

addendum to the MRE I by scholars (Basu Majumdar : 2016, 16), there are some interesting differences between the MRE-I and II as pointed by Falk (Falk 2006). For example, MRE-I speaks about written instructions (*likhita*), while MRE-II never speaks to *likhita* but *ānapayati* or *nivesayati* which means the MRE-II uses terms relating to oral instructions. Falk also opined that MRE-I was meant for the people of specific places but MRE-II was for the whole country (Falk 2006, 57).

These sets of MRE are imperative to understand the boundary of Aśoka's empire in Deccan. The MRE-I contains the word *aṁta* which denotes the people living beyond border. Therefore, the presence of MRE-I in the central India which is far away from Aśoka's border is the most striking data as already mentioned above. Besides mentioning the borderers, two of his inscriptions mention him as the king of Magadha (*lājā-Māgadhe*). This mention is again significant as the inscription was placed far away from his metropolitan i.e. the Magadha. Here it is also interesting to note that Aśoka is mentioned by his name only in southern province along with Gujarra in Madhya Pradesh. We do not have enough supportive evidences to throw light on the backdrop of using his name in only one site in Madhya Pradesh and referring himself as the king of Magadha in only two inscriptions[11]. Some of the scholars have tried to connect the introduction of Aśoka as *lājā-Māgadhe* with the Buddhist council held during Aśoka's reign but A.M. Shastri in his article clearly shows that use of the title *lājā-Māgadhe* has no connection with the Buddhist Council. He opines it was just another mode of mentioning the emperor like *devānaṁpriya* (Shastri 1997-98, 57). However, we do not have enough evidences to answer the questions.

The geographical distribution of Aśokan edicts clearly shows that there is a large gap between the Madhya Pradesh and Karnataka where presence of Aśokan edicts is yet to be confirmed. Thus, now we would like to discuss the scenario of Aśokan inscriptions in Maharashtra or to be more specific in the Vidarbha region.

It is generally said that Maharashtra did not yield any Aśokan inscription except those of the Sopara. However, Beglar has reported about an Aśokan inscription from Deotek (Cunningham 1877) in the district of Chandrapur in the present state of Maharashtra. It seems that half of the pillar inscription was intentionally damaged to engrave

another late inscription of the Vākāṭaka king Rudrasena (Shastri 1997-98). The inscription was published in the *Corpus Inscriptionum Indicarum* (Cunningham 1877) but V.V. Mirashi for the first time discussed the inscription in details (Mirashi 1960). It is already noted above (see note 6) that the inscription records the command of a *Sāmi* who is mentioned as a king. The content of the inscription is very close to Aśoka's non-slaughtering policy. Thus, the fragmentary inscription is identified with the Aśokan inscription by the scholars but as Mirashi also points that the use of the word *sāmi* is nowhere in Aśokan edicts. Besides, some of the letters of Deotek inscription are of later period. Therefore, attribution of the Deotek inscription as Aśokan, is not beyond doubt. Still Mirashi has inclined to refer the inscription to the time of Aśoka mainly based on the information of non-slaughtering of animals. It is noteworthy that the words *sāmi, āmacā*, etc. were common to the post-Mauryan inscriptions of the region mainly in those of the Western Kṣatrapas and of the Sātavāhanas. In this context we must mention that the Deotek inscription did not grasp much attention of the scholars. However, Pradip S. Meshram and Dhiraj Y. Choudhari first argued that this is not an Aśokan inscription. They also mentioned about the discovery of Bhivakund and Chandrakhedā in support of their view but unfortunately neither any detail of these discoveries is mentioned by them, nor any reference has been given in their article (Meshram and Chaudhari 2010, 152-56). But as we mentioned above the language and the palaeography suggest its non-Mauryan origin, it is difficult to place the inscription as an Aśokan edict. Even if we take the inscription as Aśokan, it was probably issued by some of his local ally or administrative officers and not directly by Aśoka himself. Here it is worthwhile to note that even Beglar opines that the inscription was not originally from this region (Beglar 1878). Thus, the origin of the inscription is also not beyond doubt. Thus, we shall exclude Deotek inscription from Aśokan list.

The other inscription from Vidarbha region is said to have acquired from a village named Ghuggus in the same district i.e. Chandrapur district of Maharashtra. A. M. Shastri mentions that both the inscription and the reporter of the inscription were undetectable and only a 'xerox' (Shastri: 1997-98, 55) copy of half of the inscription was available to

him. Gugghus inscription is a close copy of the Bairat stone slab or Calcutta-Bairat inscription of Aśoka and here he has mentioned himself as the king of Magadha (*lājā-Māgadhe*) like the Bairat version. Thus, only two inscriptions from Vidarbha region have been reported so far as Aśokan but unfortunately both the inscriptions are not beyond doubts in terms of their origin.

The geographical distribution of the Aśokan edicts in the taken geographical region displays the northern most MRE in Gujarra, Madhya Pradesh, while there are two more sites in this northern cluster – one is Rupnath and another is Saru-Maru (Panguraria), both situated in Madhya Pradesh. The Rupnath version of MRE-I clearly mentions that there must be stone pillars engraved with his proclamation. He also appointed officers everywhere in different provinces. Like Rupnath, the Saru-Maru edict of Aśoka also mentions "Wherever there are rocks and wherever there are pillars of stone, [everywhere this matter] should be written…" (Sircar1979, 103). Thus, though the inscriptions mention the border-people, it is not clear from the inscriptions that these edicts were intending to place only in the border land rather on the basis of the above mentioned instruction one can argue that the matter of MRE-I was not only made for the borderland, but we could not ignore the fact that both the edicts reported from Chandrapura are not beyond doubts. It is also worthwhile to note in this context that Aśoka is the only king in early India who has made several copies of the same inscriptions with little variation and modification considering the place of the inscription, their dialect etc (Thaplyal 2016). Thus, it is quite unusual for him to set up the inscriptions mentioning the borderers within the territory located far away from border land. Therefore, from the available epigraphic data it seems that Aśoka did not rule directly over the Vidarbha region or the part was not under his empire during at least at the early phase of his reign. However a further study and more information regarding Aśokan inscriptions might address the issues properly in future.

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Notes

[1] https://books.google.co.in/books?id=7ciHAkP9QqQC&pg =PT26&lpg=PT26&dq=saru+maru+buddhist+monastery+and+ashokan+edi ct+from+Madhya+pradesh&source=bl&ots=Mr_gAOAemV&s ig=QJDJz6QzlQ747zDa7YfNfNUX09s&hl=en &sa=X&ved=2ahUKEwiMpeqd8 sjcAhWHNI8KHTWuDokQ 6AEwDHoECAcQAQ#v=onepage&q =saru%20maru%20buddhist%20monastery%20and%20ashokan %20eict%20from%20Madhya%20pradesh&f=false (read on 21/07/18 at 1.55 pm).

[2] For example the inscriptions from Barabar and Saru-Maru (Panguraria) respectively.

[3] Basic content of MRE I –
"King Devanampiya speaks thus:
For two and a half years I was a (Buddhist) layman and I was not very zealous. For somewhat more than a year I visited the *saṅgha* and became very zealous. The gods have formerly not mingled with men, but now they are mingled. This is the result of zeal. Not only high persons can reach this aim, no, even common people can reach it if they are zealous." (Falk 2006, 55.).

[4] It records king's exhortation to the Buddhist clergy to remain united. It also mentions those who try to break the rule of the *Saṁghas* will be driven out from the *saṁghas*. (Kulkarni 1990, 306.).

[5] The inscription records the command of a *sāmi* who is mentioned as a king. The inscription talks about the prohibition of capturing and slaughtering of animals and also declares punishment for such actions. The inscription refers to an *āmacā* and the last line probably bears the regnal year 14.

[6] Content wise the inscription is very close to the Bairat stone slab or Calcutta-Bairat inscription. The inscription mentions Priyadarśi as a king of Magadha (*lājā Māgadhe*).

[7] MRE II was almost an appendix and an addendum to the MRE I. Aśoka speaks on some of his *Dhamma* ideology (Basu Majumdar 2016, 16) in these edicts. People of the border land are also mentioned in MRE II like the MRE I.

[8] Sircar reads it as *ye* but the letter is clearly *yā*.

[9] However in the Devanagari transcript she has used the same reading as given by Sircar.

[10] Aśoka himself mentioned the region beyond Karnataka as *anta avijita* i.e. unconquered frontier area (Basu Majumdar : 2016, 15.)

[11] *Lājā Māgadhe* is mentioned in the Bhabru-Calcutta-Bairat Minor Rock Edict (Talim 2010) and in the Ghuggus inscription (Shastri 1997-98).

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On a Land-Grant of Mahendrapála Deva of Kanauj.—By Bábu Rájendralála Mitra, *Corresponding Member of the German Oriental Society.*

In 1848 Mr. J. W. Laidlay, then editor of the Journal, published a translation, by me, of a Sanskrita inscription incised on a large slab of copper which had been presented to the Society by the late Col. J. C. Stacy. It was the record of a gift of land by a prince of the royal house of Mahodaya (Kanauj), and remarkable for being surmounted by a figure of Bhagavatí and the genealogy of the princes named, cast in relief on a tablet of brass. A counterpart of that document has lately been found in the village of Dighwa Doobaneshar, in the Pergunnah of Maṅghee, Zillah Sarun. Mr. P. Peppe, to whom I am indebted for a transcript of the record, was informed that "it was dug out of a field some years ago by a Dighwaëť Brahman of Chhapráh;" but Mr. James Cosserat of Motihári, who has favoured the Society with a carefully prepared facsimile of the monument, learnt on enquiry of the owners that "their ancestors found it in a temple in a ruined Musalman fort in that village, but it was so long ago that they did not seem to have any distinct tradition about it, nor to be able to give any authentic information on the subject." The weight of the plate, according to him, is thirty seers. The surmounting tablet he says "is a casting apparently of iron with a mixture of copper, and the letters raised. It appears of older date than the lower portion of copper engraved. There is a small figure of an idol at the summit; the part left uncopied is a cornice and the idol itself (very indistinct) which I have found it beyond the power of the natives here to take an impression of. The whole of the inscription, however, has been got. The upper portion has been roughly but securely joined to the lower or larger and engraved part. The plate has suffered from fire, the traces of which appear in the indistinctness of parts of the impression."

The size of the monument, the style of the character incised on it, and the tablet and the figure of Bhagavatí which surmount it, bear so close a resemblance to those of the Stacy plate that the two documents seem to have been prepared by the same artist, and inscribed by the same engraver. The genealogy of both begins with the same prince, Devas'akti Deva, but while the Dighwa plate ends with the sixth descendant Mahendrapálá Deva, the Stacy record carries it

down to Vináyakapála, brother and successor of Bhoja Deva who was the immediate heir of Mahendra.

The subject of the grant in the Stacy plate is the village of Tikkarika, in the district of Benares, that of the Dighwa record the village of Pámayaka, in the subdivision of Talayiká, of the district of Srávastí.

The date of the Dighwa grant is "the 7th of the waxing moon in the month of Mágha, Samvatsara 389," the last figure being open to question. In my first reading of the Stacy plate I took its date to be "the 6th day of the dark half of the moon in the solar month of *Phálguna* Samvatsara 65;" the word "solar" being deduced from an indistinct letter which I took for भा "light" or the "sun." In the redecipherment* of the record published in the XXXI. Vol. of this Journal (p. 15) Professor F. E. Hall has dismissed the figures by stating that after the word Samvatsara "follow two unrecognized numerals, denoting a dynastic year, and an indistinct compound character of unknown significance. Further on the day of the semilunation is expressed by a single numeral. It is the same as the first of the two just spoken of." On re-examining the document with the light of the Dighwa plate, I feel disposed to take the first figure for an ancient 4, being somewhat similar to the same figure in the Western caves and on coins. The second is an imperfect or partially effaced cypher, or possibly an 8, but in that case very unlike the same figure in the Dighwa plate; and the indistinct letter after it, which looks very much like a *bhra* and no figure, having the perpendicular line of the long vowel after it, a 9. The figure for the semilunation, being the counterpart of the first figure of the year, must of course be read as 4, making the date "the 4th of the wane in the month of Phálguna, Samvatsara 409." This would bring the record 19 years after the Dighwa plate, which would be in no way too much for the latter portion of the reign of Mahendrapála, the whole of that of Bhoja and the beginning of that of Vináyakapála. The last figures, however, being in both the documents very doubtful if we take them for initials

* It is remarkable that in this so-called "redecypherment" the only emendation of any value is the relationship of Vináyaka Pála to Mahendra. The learned Professor makes him a son, whereas my reading made him a grandson. For the rest the new reading adds little to our knowledge of the document beyond the fact of there being some obvious inaccuracies of spelling in the original which in my reading I had corrected without note, and a few mis-prints in my transcript which had escaped my eyes. The "redecypherment" did not, even in the opinion of the Professor, render a re-translation necessary.

of some now unknown words the dates would read 38 and 40, 45 or 48 as we accepted the second figure of the Stacy plate to be a cypher a 5, or an 8, giving an interval of 2, 7 or 10 years between Mahendra and Vináyaka. I annex facsimiles of the two dates, in order that others may be enabled to solve them more successfully than I have been able to do.

The word *samvatsara* means simply a year and not an era, it is impossible therefore to ascertain to what particular era allusion has been made by the two plates. Had the era of Vikrama been meant, the word *samvat* would have been preferred; besides the character of the plates is too modern to entitle them to a place in the 4th century of Vikrama. If the Ballabhi samvat be assumed the date of the Dighwa document would be carried back to (318 + 389 = 707) the beginning of the 8th century, which would lead to the anachronism of making Devas'akti and his successor contemporaries of Harshavardhana and co-sovereigns in Kanauj in the beginning of the 8th century; even if it could be shewn that the Ballabhi samvat had extended so far to the north-east of Guzerat—the place of its origin—as Kanauj. Again, if the Harsha era be assumed,—a very likely era being a purely Kanauj one—the date of Mahendra would be brought to the end of the 10th century, when Kanauj was for certain under the Tomaras. Under these circumstances I am compelled to take the era of the records to be a local or family one, the zero of which it is impossible now to determine. This does not prevent us, however, from ascertaining the probable period when the princes under notice flourished in India. Govindaraja, sovereign of Ráshtrakúta in the south Marhatta country, in a donative inscription dated S'aka 730 = A. D. 808, states that his father Paura had once entered Márwar at the head of a hostile army, and "conquered Vatsarája, who had been intoxicated with the wealth of the king of Gauḍa, which he had seized." This Vatsarája was, we suppose, the second potentate of our list and not a prince of Marwar which he is nowhere said to have been, though he was defeated in that country. There is ample testimony to shew that Marwar and a good part of Malwa was, at the end of the 8th and the beginning of the 9th centuries, under the sovereignty of the Kanaujites, and it is more probable that a Kanauj king, in the zenith of his power, should extend his arms as far as Gauḍa on the one side and Malwa on the other, than that a prince

of Marwar should cross the territories of the Kanauj kings in quest of "the wealth of Gauḍa", which could not have been at any time so great as that of Kanauj, notwithstanding the martial successes of some of the Pála rájás of Bengal, who at one time extended their conquests as far as Benares. It is to be admitted that the name Vatsa has been borne by several kings, and that according to Mallinátha and Somadeva, a country, a town, and even a race of men have borne the same title, but the inscription under notice distinctly alludes to a king Vatsarája who conquered Gauḍa and not to a "king Vatsa" (Vatsa rájá)—and it is evident that at the time when the said Vatsarája lived, the conquest of Gauḍa from the west could be possible only to a Kanauj king, and therefore we may in this instance from the identity of name assume the identity of person. If this assumption be admitted Vatsarája must have lived about the end of the eighth and the beginning of the ninth century, at the usual average period of eighteen years to a reign, from 796 to 814, his predecessor Devas'akti, the founder of the dynasty, commencing his reign from 775-76. According to this calculation the several princes will stand as follow:—

Devas'akti A. D. 775-776.*
Vatsarája, son of D., 796.
Nágabhatta, son of V., 814.
Rámabhadra, son of N., 832.
Bhoja I., son of R., 850.
Mahendrapála, son of B., 868.
Bhoja II., son of M., 885.
Vináyakapála, son of M., brother of B. II., 900.

This table, however, has to be adjusted with reference to the date of the Stacy plate, which places an interval of, at the outside, only 19 years between Mahendrapála and Vináyaka. And if we provide for it by reducing the reign of Bhoja II. to eight years, we shall bring him to the middle of the eighth decade of the 9th century and make him synchronous with the Bhoja of Gwalior, with whom he was most probably identical.

The Tomaras assumed the sovereignty of Kanauj about the end of the 10th or the beginning of the 11th century, we have therefore a gap of about 80 to 100 years to bridge over to complete the list of

* In the quotation of this date in my paper on the Bhojas (ante XXXII. p. 96), a misprint has converted the 776 into 779.

Kanauj kings from Devas'akti to the end of the 12th century when the Mahomedans finally conquered the country. To fill up this gap, as far as our knowledge at present extends, we have only two names, those of Sáhasanka and Vira Siñha. The latter was the contemporary of Ádisúra king of Bengal who obtained from him five learned Brahmans to instruct his people in certain Vedic ceremonies.* This happened according to the genealogical tables and the memorial verses *(Kulapanjis* and *Kuláchárya Kárika's)* of the Bengal Ghatakas in the S'aka year 994 = A. D. 1072. The *Khiti'sávañsávalí Charita* places the event in the year 1078, and Ritter's Geography, in 1068 A. D. These dates, however, are all evidently incorrect, as they bring us to the time of Ballála Sena who lived several generations after Ádis'úra. I depend therefore on the genealogical tables for the date of the latter. Of the five Káyasthas who came to Bengal on the invitation of Ádis'úrá three, viz., Makaranda Ghosa, Dasaratha Basu and Kálidása Mitra, acknowledged service to the Brahmans and were ennobled by the king as the highest patricians (Kulinas) of his land. The other two, Dasaratha Guha and Purusottama Datta, repudiated the right of the Brahmans to call them their servants and declined to assume the servile title Dása. Purusottam with noble pride exclaimed "A Datta was never a servant." *(Datta káro bhritya naya.)* This temerity deprived them of court favour and brought on degradation to the ranks of the plebean or Maulika. The Kulina Káyasthas as well as the proud Datta have carefully preserved their genealogy. They hold periodical meetings (ekajáyis) at which all the family heralds or ghataks assemble and record the names of every succeeding generation. The last meeting of this kind was held several years ago at the house of Rájá Rádhákánta Deva when the names of the 24th generation of kulinás were duly recorded. The writer of this note is himself one of the 24th in descent from Kálidása Mitra. In some families the 26th, the 27th and even the 28th descent have already appeared, but no where later. Taking the average at 27 generations, we have at three generations to a century just nine hundred years from this date, or A. D. 964, for the time of

* The *Khiti'sa-vansávali-charita* says, to officiate at the performance of a ceremony for obviating the evil effects of the fall of a vulture on the house top which the Brahmins of Bengal knew not how to perform. The *Ghatak kárika* quoted by Rájá Rádhákánta Deva makes the ignorance more general, but does not advert to the expiation for the fall of a vulture.

the first advent of the Káyasthas in Bengal, and of the period of Vira Siñha's reign.

Of the Brahmans who came to the court of Ádis'úra the most renowned was Bhaṭṭa Náráyaṇa. He wrote the *Veniságñhára* and presented it to Ádis'úra, on his reception by that monarch at his palace in Rámapála. He also wrote a treatise on religious ceremonies entitled *Prayogaratna* which is still extant. He purchased five villages from Ádis'úra which in the time of one of his descendants Bhabánanda Majumadara formed the nucleus of a large principality, that of the Nadia Rájás, who are his immediate descendants. Next to him was S'riharsha of the clan (gotra) of Bharadwája whose descendants form the present Mookerjea familyof the Kulina Brahmans.* No work of any note as far as we know, has been attributed to him. It seems probable, however, that he is the same with the author of the *Naishada Charita*. That work was written by a poet of Kanauj, for he prides himself at the end of his poem for having been honoured with a betel leaf by his sovereign. He also acknowledges himself to be the author of nine different works including among others a "history of the kings of Gauḍa" *(Gauḍorvíshakulapras'asti)*, "a description of the ocean" *(Arṇava varṇana)* and a refutation of some of the leading philosophical systems of the Hindus *(Khandana khanda khádya)*. Now Bengal has always been described as the Bœotia of India; its name occurs but rarely in Sanskrit literature, and it is generally called in derision a country to which the Pándavas never came even for a marauding excursion, *Pándava varjita des'a;* while its kings, with the exception of some of the Pálas, were poor, insignificant and unknown. It is not likely therefore that either Bengal or its kings should have been thought of as a fit subject of praise for a royal poet like S riharsha of Kashmir, or to a laureate of the proud court of Kanauj in the 7th century to whom the *Naishada Charita* and, by implication, the *Gauḍorvísha-kula-pras'asti* have at different times been attributed. The "description of the ocean" too is not a work of that kind which is likely to proceed from men in the vale of Kashmir or the inland town of Gádhipura. To the former the snows of the Himalaya would offer a more appropriate theme for song than the distant and briny ocean. These objections do not apply to the S'riharsha of Bengal. He was

* The names of the other three Brahmans were Daksha, Vedagarbha and Chhándaḍa.

born and brought up in Kanauj, and as a court poet of that kingdom he could well pride himself on the favours he received from his sovereign. He came then to Gauḍa and, to propitiate his new master, thought proper to strike his lyre in praise of his family. In Bengal he must have seen the sea, for it is on record that the five Brahmans came to Gangáságara, and that offered to him a novel and majestic theme for his descriptive powers, while to display his versatility he took up the philosophical treatise *Khandana Khanda*, which is common enough in Bengal but is scarcely known in Kashmir. This assumption, however, probable as it may appear, is, it must be admitted, founded entirely upon presumptive evidence, and must await future more satisfactory research for confirmation. At present it is opposed to the opinions of the late Professor Wilson and of Dr. F. E. Hall.

With regard to Sáhasañka I have little to say beyond what is already known to Indian antiquarians. There were evidently two princes of that name in Kanauj, one a predecessor of Harshavardhana in the 6th century and the other a distant successor in the 10th, probably a contemporary of the author of the Naíshada who is said to have recorded his biography, although that work is not now extant, and it is impossible to say to whom it referred. Its name, which is all that is left to us, is remarkable; it is *Navasáhasañka charita* which may mean "a new biography of Sáhasañka," in contradistinction to an old one; or "a biography of the new Sáhasañka," to distinguish the hero of the work from a former potentate of the same name who rivalled him in glory, or, as suggested by Professor Hall, "the biography of the nine Sáhasañkas," who, like the nine Nandas of Páṭaliputra, reigned successively in Kanauj. If the last be the correct interpretation we shall find in the eight princes of the Benares plate with a hypothetical descendant of the last of the series, just the necessary number for our purpose. In the absence, however, of the original work such speculation cannot lead to any satisfactory result.

Transcript of a copper-plate grant from Dighwa in Chhuprah.

(I.) ॐ *a*स्वस्ति श्रीमहोदयसमावासितानेb[b]नौहस्त्यश्वरथपत्तिसम्पन्नःc[c] सुडाचारात्परमवैष्णव (II.) महाराज श्रीदेd[d]वशक्तिदेd[d]वस्य पुत्रस्तत्पादानुध्यातःe[e] श्रीभूयिष्ठादेd[d]व्यामुत्पन्नः परममाहेश्वर (III.) महाराज श्रीवत्सराजदेd[d]वस्य पुत्रस्तत्पादानुध्यातः

श्रीसुन्दरीf देd व्यामुत्पन्नः परं gभगवती भ (IV.) क्त महाराज श्रीनागभटhदेdवस्तस्य पुत्रस्तत्पादानुध्यातः श्रीमहीसटादेdव्यामुत्पन्नः परमादित्य (V.) भक्त महाराज श्रीरामभद्रदेdवस्तस्य पुत्रस्तत्पादानुध्यातः श्रीमदप्यादेdव्यामुत्प (VI.) न्नः परंg भगवतीभक्त महाराज श्रीभोजदेdवस्तस्य पुत्रस्तत्पादानुध्यातः श्रीचन्द्र (VII.) (भ)ट्टारिकादेdव्यामुत्पन्नः परंg भगवतीभक्त महाराज श्रीमहेन्द्रपालदेवः। आवस्ती (VIII.) भुक्तःi। आवस्ती मण्डलान्तःपाति बलयिका-विषयसम्बद्धपामयकग्रामसमु (IX.) पगतान् सर्वानेव यथास्थाननियुक्तान् प्रति j वासिनश्च समाkज्ञापयति उपरिlखि- (X.) खितग्रामचतुर्बाmयसमेत आचन्द्रार्कक्षितिक्षमं पूर्वदत्त देवब्राह्मदेयवर्जिn(त) (XI.) मया पित्रोःo पुण्याभिवृद्धये सावर्णसगोत्र ऋग्वेदचन्द्रमसp ब्रह्मचारि (XII.) भट्टपद्मेसरायqसवितुः कुम्भसंक्रान्तौ स्नात्वा प्रतिग्रहेण प्रतिपादित इति विदित्वा (XIII.) भवद्भिरस्मदनुमन्तव्यं प्रतिवासिभिरप्याज्ञाश्रवणविधेये भूत्वा सर्वेषामेवायस्य संस्था (XIV.) पनायैr इति श्रीम द्वारकश प्रयुक्तस्य शासनस्य स्थिरायतःt॥ संवत १८६ माघसुदि ७ निवर्तं॥

a. Not legible in the facsimile, but there is space for it. The transcript prepared for Mr. Peppe has it.

b. The vowel mark is not legible.

c. The visargah is omitted in the original.

d. The vowel mark is not legible in the original.

e. In the Stacy record I took this word for *pádántakhyáta* "celebrated after the foot of another" from *pádasya* "of foot," *ante* "after" *khyáta* "celebrated," the foot standing by a figure of synecdoche for the predecessor, this mode of expressing respect for parents and elder relatives being common in India. Accordingly we see the usual address on letters from a son to his father running, "to the auspicious lotus-like feet of my respected father so and so:" *Amuka-pitá-thákura-mahásaya-śrícharaṇa-kamaleshu*, instead of "to my father so and so, &c." In criticising this reading of mine, Professor Hall in the XXVIIth volume of the Journal, (p. 226), observed, "This epithet would signify, if any thing 'whose toes are notorious.'" He was led to the mistake by referring to his Dictionary for the compound term *pádánta* instead of the separate words *páda* and *anta*.

Commenting on the word *pádánudhyáta* he says, "It appears, from two examples occurring in the same inscription, that it sometimes indicates merely a kindred successor, or perhaps only a successor. Where of two brothers, the elder and younger, the latter accedes to the throne in sequence to the former, the words (?) *pâdánudhyáta* are, in the cases alluded to, used to denote their relation as consecutive princes" (ante XXVIII. p. 8). Colebrooke takes the compound to mean "whose feet are revered by," and that is the correct interpretation. It is used to indicate a junior blood relation and successor but never a mere successor, for the expression of respect would be uncalled for in that case.

f. The first two syllables of the name obliterated in the original. I supply them from my reading of the Stacy plate.

g. For *parama ; param* is incorrect.

h. *Bhaṭa* for *bhaṭṭa.*

i. Incorrectly engraved *Yukto.*

j. The *r* of *prati* is missing.

k. The *jna* is curiously written.

l. The *i* of *ri* is omitted.

m. The *r* of *rv* is omitted.

n. The portion commencing from पुव &c. is legible enough, but of doubtful meaning. I take it for पूर्वदत्तदेवप्राग्दाय.

o. The ॅ of ॅा is omitted.

p. I know not the meaning of the word *Chandragasa.* It is evidently intended to indicate a particular class of Brahmachárí.

q. पशेश्वराय *recte.*

r. पलया in original.

s. For महारक.

t. The last word is grammatically wrong.

Translation.

Om! May it prove auspicious! Possessed, through his greatness, of innumerable war-boats, elephants, cars, horse and foot soldiers, and a thorough Vaishṇava from the purity of his conduct, was the Mahaṛája S'rí Devas'akti Deva. His son and successor, born of S'rí Bhuyiká Deví, was the devout follower of Mahesvara Mahárája S'rí Vatsarája Deva; whose son and successor, born of S'rí Sundarí Deví, was the devout follower of Bhagavati Maharája S'ri Nágabhaṭṭa Deva. His son and successor, born of S'rí Mahisaṭá Deví, was the devout follower

of the Sun Mahárája S'rí Rámabhadra Deva, whose son and successor born of S'rí Madappá Deví, was the devout follower of Bhagavat, Maharája S'rí Bhoja Deva. His son and successor, born of S'rí Chandra-bhaṭṭarikâ Deví, was the devout follower of Bhagavatí Maharája S'rí Mahendrapála Deva who, when in S'rávastí, thus proclaimed to the assembled crowd of the inhabitants and neighbours of the village of Pámayaka of the subdivision *(vis'aya)* of Valayiká in the district *(Mandala)* of S'rávastí. The aforesaid village with all its produce, exclusive of what has been already alienated as shares to divinities of the place, has been this day bestowed by me, for the promotion of my parents' virtue, after performance of ablution on the occasion of a conjunction of the sun with the aquarius, and to last for the period of the duration of the sun, the moon and the earth, upon Bhaṭṭa Padmesvara of Sávarṇa Gotra, a Brahmachárí of the Kauthuma —— ? Sákhá of the Sáma Veda. Knowing this, you should abide by it, and the neighbours, mindful of this order, should leave unmolested all the rights and privileges (of the donee). (This is written) for the permanency of the Edict of his auspicious Majesty. Done on the 7th of the waxing moon in the month of Mágha, Samvat 389.

P. S.—I avail myself of this opportunity to acknowledge the correctness of General Cunningham's last emendation of my reading of the Pehewa inscription. The name of Bhoja's father in that record is Rámabhadra, as pointed out by the General, and not Rámachandra as originally read by me. The great similarity between *bha* and *cha* in the mediæval Nagari and the commonness of the name Rámachandra led me into error.

The deduction, however, of the first Bhoja of that inscription being the same with the Bhoja of Gwalior is still open to question. To prove the identity the General has been put to the necessity of allowing twenty-five years to each of the eight princes of the time of Devasakti, when our antiquarians are all unanimously of opinion that the average period of an Indian reign has never been above eighteen years. The learned General himself, who holds the highest rank as an authority in all matters connected with Indian Archæology, has repeatedly in his former papers adopted the same average, and I do not see any reason to depart from it in the present instance. Had the Bhoja of Gwalior been acknowledged in any record as the son of

Rámabhadra and a sovereign of Kanauj, the case would have been different, but as it stands we have simply a Bhoja at Gwalior in A. D. 876, but nothing to shew that he was in any way connected with Kanauj or Pehewa, and we cannot therefore at once accept him to be the same with the first Bhoja of Kanauj. The name Bhoja has been so frequently assumed by Indian princes from the time of the Rig Veda to within the last two hundred years, that it cannot possibly be taken by itself as a guide to the identification of persons or dates. The identity of names in such cases can never be a proof of identity of persons. No doubt the Kanaujites had for a time exercised paramount power in Gwalior, but there is nothing to prove that Bhoja son of Rámabhadra did so, nor anything to prevent Bhoja son of Mahendrapála, being the individual named in the Gwalior inscription.

The era of the Pehewa record may be that of Harshavardhana, but that of the Stacy and Dighwa plates cannot be the same, for they place an interval of 113 years between Bhoja and his son Mahendrapála. It is worthy of remark too, that it is odd, that the father and son should adopt two different eras.

General Cunningham observes that the Pehewa record as published by me comprises portions of two separate inscriptions and that I mistook them for one. In explanation of this charge I beg to state that I have never been to Pehewa myself, and that the inscription I published was communicated to the Asiatic Society by Mr. L. Bowring, C. S., who distinctly stated it to be one record, and added that it was "engraved on a tablet of red sandstone in the temple of a follower of the Gorakhnath persuasion," and not on two tablets at different places. On the face of this, all I could say at the time when I noticed the record was, that "the document was divided into two portions, first of which was in verse and comprised twenty-one lines, and the second was in prose and included eight lines." The facsimile was full of lacunæ and blots, and, as now appears, very imperfect, the prose portion containing only eight out of sixteen and a quarter lines. It is a pity that the General who has lately visited and examined the record has not given more detailed description of the places which the two inscriptions occupy in the temple, nor furnished the Society with fresh facsimiles. The missing eight and a quarter lines of the prose portion is likely to throw much new light on the question at issue.

RAJENDRALAL MITRA: A NINETEENTH CENTURY SCHOLAR ON THE INTERPRETATION OF A LAND GRANT RECORD

SAYANTANI PAL

Rajendralal Mitra (1822-1891) has been widely acclaimed as the first professional among the Indian historians. He was a versatile scholar whose academic interests ranged from Sanskrit language, literature, religion, society, political history, antiquarian study to the history of art. Rajendralal lived and worked at a period when discovering ancient texts, inscriptions and editing and translating such primary sources was of central importance to the historians. The article under discussion reflects the contemporary methods of historical analysis of an inscriptional text.

Rajendralal, however, began his career in an altogether different field. As a youth he took admission to the Calcutta Medical College. He also studied Indian and Western law.[1] However, these two fields of knowledge ultimately gave way to his interest in the study of languages. He had mastered knowledge in different languages like English, Sanskrit, Persian, Urdu and Hindi. In April, 1846 he became the Secretary and Librarian of the Asiatic Society of Bengal which was then primarily an institution dominated by the Europeans. It has been aptly remarked that "Rajendralal owed his ideas of history as well as the methodology of its presentation mainly to this learned institution."[2]

Rajendralal started writing at a period when Macauley's Minute in 1935 gave the verdict in favour of English education. The increasing adaptation of English author's writings as text books had opened up the western world to the Indians. However, it also posed a crisis to the cultural identity of the Bengali educated class by debunking the Oriental culture. It thus gave birth to the urge among them to search for their cultural heritage in the past.[3]

The article under discussion reflects Rajendralal's approach and understanding of a land grant record which is an important source material for the study of early Indian history. Usually land grant records were engraved on copper plate charters in order to give them a permanent character as a deed of transfer of land. Such grants were religious in nature and thus tax-free. Thus for the sake of safe keeping the recipients often used to bury them underground or keep them in other secret places. As a result copper plates are often found by cultivators during cultivation of land. In the colonial period large number of such records were found and collected by explorers. Estampages or lithographs were taken with care and sent to the Asiatic Society of Bengal, then the premier institution for reading and interpretation of such records. The journals and proceedings of the Society regularly published the inscriptions discovered from various parts of the country.

Rajendralal Mitra's reading in Sanskrit language and literature was obviously a factor leading to his interest in Sanskrit inscriptions. To read inscriptions knowledge of palaeography was also necessary. The article under discussion reflects his authority over these two fields.

In the present article Rajendralal has edited a land grant of Mahendrapala, the Gurjara Pratihara king of Kanauj in the end of 9th and the beginning of the 10th century. Earlier in 1848 Mitra's translation of a copper plate presented to the Society by Col. Stacy was published in the proceedings of the Society. It had a seal with the figure of Bhagavati and the genealogy of the ruling house. The plate was that of Gurjara Pratihara Vinayakapala of Mahodaya (Kanauj) dated year 188. Rajendralal however read the year as 65.

When Mitra saw the present plate, he took it as the 'counterpart' of the earlier document of Vinayakapala. He gives the name of the findspot of the present plate as the village of 'Dighwa Doobaneshar' in the then 'Sarun' district of Bihar. It is obviously the present village of Dighwa Dubauli in the Gopalganj District of Bihar. The transcript of the inscription was sent to the Society by P. Peppe. Mitra edits the inscription from that transcript in the present article. The plate, found sometimes before 1864 is engraved on one side. It also had a seal,

same as the Vinayakapala grant. Mitra, however, did not give the reading of the text on the seal. It was done later by J.F. Fleet.[4]

The story of the discovery of a record is important to understand its context. Mitra carefully verified the statements of the persons who were responsible for sending the copies of the record (in the form of transcript) to the Society and noticed the discrepancies in their statement. He concludes that the record was not actually dug out from a field as told by Peppe, rather it was found in a temple in a ruined fort in that village.

Mitra begins his study with the story of the discovery of the record, its findspot, weight etc. According to him the seal might be of an earlier date than the text of the plate, a view not endorsed by the subsequent scholars. He thinks that the plate of Vinayakapala, discovered earlier, and the present plate were inscribed by the same engraver and prepared by the same artist. He goes on comparing the two plates in the matter of composition and organization of the data. This issue of commonality among copper plate charters of the same king or even of the same dynasty is not unexpected since they used to be composed and often engraved by the same poet and scribe.

Mitra notes that the genealogy of the rulers in the present plate ends early with the descendant of Mahendrapala while the plate of Vinayakapala carries it down to Vinayakapala, a later ruler. Thus the present plate is earlier than the other plate.

The reading of the inscription by Mitra was more or less same and agrees with the later edition by J.F. Fleet. He however failed to read the name of the granted village correctly. Apart from this minor point, the more important issue was the reading of the date. Mitra read it as 389 while actually the reading was 155. Mitra's article was also accompanied by a lithograph of the date that was later dismissed by Fleet as incorrect.

To determine the equivalent of the date in terms of the Christian Era was another major problem. Mitra devoted much space in his article to discuss it. He discusses three possibilities for the date if it was in an era, although he admitted that the word *samvatsara* refers to year and not era. He discusses the problem of dates with reference

to a well known king, Harshavardhana who ruled in the first half of the 7th century. However, none of the eras like Valabhi samvat or Harsha samvat found suitable for the date of the Dighwa record, he finally took it to be a local or rather family era. This assumption was however not correct.

Identifying the kings mentioned in an inscription, determining their reign period and finally structuring the genealogy of the ruling dynasty are the major issues that preoccupied the mind of the scholars studying inscriptions in that period. Following the contemporary trend of research which gave utmost importance to political or rather dynastic history, Mitra also devotes a major part of his article to discuss the chronology and period of the Gurjara Pratihara dynasty. Vatsaraja, mentioned in a Rashtrakuta record as having been defeated by the Rashtrakutas at Marwar, has been taken as a ruler of Mahendrapala's line and not any king of Marwar. With the help of other data Rajendralal contemplates that at the end of 8th and beginning of the 9th century Marwar was under the kings of Kanauj. To Rajendralal, Kanauj was of utmost importance and it was more probable that 'a Kanauj king in the zenith of his power, should extend his arms as far as Gauda on one side and Malwa on the other, than that a prince of Marwar should cross the territories of the Kanauj kings in quest of the wealth of Gauda'. Thus the comparative capability of a local/regional family and that of an 'Imperial' house is clear in Mitra's perceptions.

The importance of Mitra's article is to prepare a genealogy of the line of Mahendrapala with approximate dates. Here he follows the standard method of assigning 18 years of reign to each king.

Towards the end of his article Mitra brings Adisura, the legendary king of Bengal in discussion. In connection to the discussion of the date of the end of the line of Mahendrapala and the beginning of the Tomaras in Kanauj Mitra explicitly states that he is a descendant of Kalidasa Mitra who is said to have come to Bengal as one of the five *kayasthas* invited by king Adisura. He goes on to narrate how among the above five kayasthas, three, including his forefather was given the status of *kulin kayastha* by the king. This Adisura was again a

contemporary of Virasinha of Kanauj. Since he was the 24th generation of Kalidasa Mitra, by a way of backward calculation he assigns Virasinha to c.964 CE.

It may, however, be pointed out that the historicity of the Adisura legend has been doubted by several scholars. Under such circumstance Mitra's dating thus stands questioned.

Another issue raised by him is that of the identity of the author Sriharsha of *Naishadhacharita*. He proposes to take him as a resident of Kanauj, who later came to Bengal and not of Kashmir which was assumed by Wilson and Hall.

It appears that Mitra's mastery over the language had enabled him to read and understand the text of the land grant. It is to be mentioned here that the content of the Indian copper plate charters was largely stereotyped and the Dharmasastras even contain chapters prescribing the format of copper plate charters. Thus reading and understanding of the text of the charters largely depends on the reader's knowledge of such texts as well as inscriptions of this category. However, when it comes to proper names most of which are Sanskritized form of local names, the scholars largely differ. Thus while Mitra read the name of the *grama* as *Pāmayaka* Fleet and others read it as *Pāniyaka*.

Fleet later re-edited the inscription in *Indian Antiquary*, volume 15. He gives a full description of the seal. He himself obtained a fresh lithograph of the plate. He also described the script as 'North Indian Nagari' of 8th century. The reading of the date is 155th year. Fleet assigned it to the Harsha Era. Thus the date of the grant would come to 761/62 CE.

To sum up, the article of Rajendralal Mitra, published in the *Journal* of the Asiatic Society, Vol. XXXIII in the year 1864 and now reprinted here reflects the contemporary trends of historical research. Reading and interpreting texts, building up the chronology of rulers and their political activity, dating them were of utmost importance in the period in which Rajendralal lived. The functional or donative portion of the land grant record, containing useful information on the area of land grant, its society and economy used to be left outside the discussion. Even Rajendralal did not discuss the question of location and

identification of the place names mentioned in the record. On the whole the article reflects the most important issues that could engage the mind of a nineteenth century researcher and interpreter of primary sources whose mastery of Sanskrit language had drawn him to the study of our ancient past.

Notes

[1] Gautam Sengupta, 'Rajendralal Mitra Ebong Bharater Silpa Itihas Charchar Adi Parva' (in Bengali), *Avabhas*, Year 3, no.2, 2003, 1-44

[2] Sisir Kumar Mitra, *Raja Rajendralal Mitra* Kolkata, 1969

[3] Shyamali Sur, 'Rajendralal Mitra as a Historian : A Revaluation', *Proceedings of the Indian History Congress*, vol.35, 1974, 370-378.

[4] J. F. Fleet, 'Dighwa-Dubauli Plate of the Maharaja Mahendrapala (Harsha)-Samvat 155', *Indian Antiquary*, vol. XV, 1886, 105-113.

Darjeeling Reconsidered: Histories, Politics and Environments, (Eds.) Townsend Middleton and Sara Shneiderman, New Delhi, Oxford University Press, 2018, Rs 950/-

Darjeeling till the late 1980s attracted very few serious chroniclers or analysts. The Gorkhaland movement transformed the gaze on Darjeeling. Books on Darjeeling, some academic, but mostly instant histories, flooded the market. The book under review, a serious academic volume, seeks to look at Darjeeling from its origin in the colonial period to its existential crises in the post-colonial period through the prisms of history, politics and environment. Three essays in Section I (Histories of Exception) survey the early history of Darjeeling, narratives of labour and mobility and scrutinise Darjeeling in the 'tourist gaze'; Section II (Political and Social Movements) has five essays examining aspects of the political developments in Darjeeling in the post-colonial period, especially the movements for autonomy/statehood and new dimensions of ethnic politics there. Section III looks at environment and labour through three essays.

The editors wish to avoid the stereotype of Darjeeling as a 'hill station' (a creation of the colonial period) and seek to present a more a 'grounded understanding' of Darjeeling as a geo-political space and of its people (to whom the book has been dedicated). In understanding the crises which mark the life of Darjeeling at the present, they wish to connect history with the present through ethnographic and political analysis. Townsend Middleton, one of the editors, delineates the early history of Darjeeling by looking at the initial settlement patterns and challenging appropriately what he calls the 'discovery narrative' which, he avers, sits nicely with the description of 'uninhabited Darjeeling'. It is, however, difficult to write the pre-1835 demographic history of Darjeeling as there is very little evidence and Middleton has not provided any fresh evidence either. His second point is about capital and labour. He narrates the development of the tea plantation with British capital and critically looks at the mode of recruitment of labour. While Darjeeling pulled migration from Nepal, which provided adequate 'push' factors at the time, there has not been any discussion of the larger context of the history of migration of labour. The migration

was also the product of broader historical developments. The push factors resulting from the reorganisation after the unification of Nepal produced the migration. The ethnic communities in eastern Nepal like the Rais, Limbus and others had no other alternative than migrating to *'Muglan'*(India). The emerging hill station provided the 'pull' factor. The beginning of the tea plantation and other economic activities including infrastructure development attracted labour in large number. Eastern Nepal was the major source. The construction of the 'brave Gurkha warrior' in the aftermath of the Anglo-Nepal war of 1814-16 facilitated the recruitment of the 'Gurkahs' in the British army. Middleton mentions the 'sardari' system and compares it with the system prevalent in Assam, where labour was brought from the Chotonagpur and Santhal Pargana. Sardari system as it operated in Darjeeling was somewhat different. What was more exploitative was the *mahajani* system prevalent in the villages and the *bastis* of the tea garden. This has found expression in folklore. As Kumar Pradhan noted in his *'Dajeelingko Nepali Jati'* , Hajariman Rai in 1900 wrote *'Daju sardar, boini kulli, tupisamma wrin'*('elder brother is sardar, the sister is coolie- both are indebted to the tip of their hair'). (Pradhan, 1982, 30). Finally, he locates the 'exceptionality' of Darjeeling in terms of colonial administrative arrangements and the beginning of the demands of the Nepalis in Darjeeling for autonomy/rights. It is, however, not clear in which way Darjeeling was an exception. This was the situation in the north-east as well as in other frontier areas. The Company's government had been, from the very beginning, trying to reach Tibet and their geopolitical interests required their intervention in this region. One could recall that in 1774, Warren Hastings sent Bogle to Tibet and this was the first attempt by the Company to establish trans-Himalayan relations. Second, the East India Company got involved in this area in the Nepal-Sikkim contestations and sought the assistance of Sikkim during the Anglo-Nepal war of 1814-16. At the end of the war Nepalese conquests from Sikkim were restored by the Company. The acquisition of Darjeeling from the Raja of Sikkim led eventually to the establishment of that curiosity of British India—the hill station. Panikkar, writing on the Himalayas, had long ago noted the growth of great hill stations from Dalhousie to Darjeeling.

This was not without its strategic implications for the government of British India. An extensive Himalayan frontier was now dotted with hill stations, 'cushioned off', as H.E.Richardson had commented, 'from the secretive hinterland of Tibet'. (Sen,1989,12)The migration of people from Nepal also provided a lucrative source of recruitment for the army. Recruiting depots were established soon. A third, significant attraction was the development of commercial relations with Central Asia. Darjeeling had the splendid opportunity to emerge as an *entrepot* of trans-Himalayan trade. The transfer of Darjeeling to the Company, it may be asserted, was an event of great importance in the history of the northern and north-eastern frontiers of India. As David Arnold had noted that both Hooker and Hodgson ''saw ...the Himalayas as a suitable location for future white settlement''. Indeed, Hodgson in 1856 stated that 'the Himalaya generally is well calculated for the settlement of the Europeans'. Settlement would encourage trans-Himalayan commerce. It would be 'perfect god-send to the starving peasantry of Ireland and of the Scotch Highlands'. (Waterhouse, 2005,200) This is the proper historical context which, unfortunately, Middleton has not, I fear, adequately treated. A footnote refers to a letter addressed to 'the Chief Minister'; pray, who was a 'Chief Minister' in 1892?

Joyeeta Sharma's essay stands out for her ability to give 'agency to the labouring subjects' and recover their 'voices, names, visages' which are generally absent in most narratives. She begins by focusing attention on the Lepchas, generally regarded as the autochthons of Sikkim. Herbert found that they and the 'Bhoteeas' were the 'reverse' of the plainsmen in nature. He argued in favour of attracting them to come and settle in Darjeeling. In response to the invitation from the authorities in Darjeeling, 51 males and 37 females came from Sikkim. During 1839, such Lepcha inhabitants included Pattho, Leeboo and Sunam Dorji who settled in Darjeeling. These Lepchas were strong, obliging and knew the land well. They accompanied early explorers during their expeditions. A notable example was Hooker, who used the Lepcha knowledge of nature and terrain in the region to collect and send more than 1,50,000 botanical specimens to the Kew Gardens. Hooker's copious writings do not mention any Lepcha name, though

it came to be known later that the accounts of his expedition were kept by a Lepcha. Meepo, a high born Lepcha accompanied him during his expeditions to Sikkim, but the collectors with their deep and extensive knowledge of the wealth of nature in the region, remain anonymous. We have now the names of Dablong, a Bhutia and Chagi, a Lepcha who later worked with other expeditions.They were also trying to get better wages and opted for tea garden work or joined the army along with those who had arrived from Nepal. Sharma also finds the variety of employment they found with, for example, the Missionaries. She narrates the entrance of the Sherpas into Darjeeling's economy as they started accepting load carrying jobs for high altitude expeditions.The most illustrious representative of the community was, of course, Tenzing Norgay. She has detailed the mobility of labour during the colonial period. One labour, in course of time, elevated himself to a petty contractor while his son amassed wealth and was given the title of Rai Bahadur. Education as social capital was grabbed when contact with the missionaries provided the opportunity. A notable example was Ganga Prasad Pradhan, who was ordinated as the first pastor from a Hill community. He made signal contribution to the emergence of print culture in Nepali in Darjeeling by founding the Gorkha Press. He also started the first newspaper- *Gorkha Khabar Kagat*. Sharma brilliantly establishes the role of these labouring men from the hills in constituting Darjeeling. She does break new ground, most significant being identifying faces in a mass of anonymity. Rune Bennike has tried to understand Darjeeling as a hill station in the tourist gaze. She has tried to make sense of the 'reflexive process' by which Darjeeling entered the global order as 'a summer place'. In fact, she shows the process of commodification of Darjeeling and seeks to find the relationship with the politics of 'belonging'. It is an interesting subject, but has little direct relation to the understanding of the political processes which dominate Darjeeling now.

The second section deals with aspects of post-indendence politics, focusing on the various phases of the Gorkhaland movement. Bethany Lacina's important essay traces an outline of the autonomy movement under the AIGL, particularly under the charismatic Deo Prakash Rai, six times MLA and thrice minister in coalition governments in the

state. The nature of the movement as we know changed in the 1980s. No one mentions that the demand for Gorkhaland was first articulated by Madan Tamang and his Pranta Parishad in 1980 when he also issued a pamphlet, *Why Gorkhaland*? Later Ghising took the wind out of the sails of Pranta Parishad and the GNLF took over. Once the DGHC agreement was signed, the main problem was for Ghising (and later, Gurung of GJM) to establish absolute control over politics in Darjeeling. Once in saddle, they blew hot and cold, raising the issue of Gorkhaland whenever there was a perception of threat and then to come to some sort of accommodation with the government of West Bengal, first under the Left Front and then under TMC. TMC has lately succeeded in leashing Gurung and making accommodation with his selof-appointed successor Tamang. The government of West Bengal also set up ethnic boards, ostensibly to ensure their development,but this could have deeper political implications. Bethany makes a very important point saying that the suffering of the anti-democratic postures of the dominant political party in the hills is the result of 'low political competition'. In fact, Ghising succeeded in erasing all other political parties. Leaders change, but the methods do not. She has studied the election results from 1952 onwards and could have emphasised that the people of Darjeeling elected members to the legislatures and parliament from all major national parties as well as from the Gorkha League. This pluralism and competition which characterised the politics of Darjeeling earlier evaporated after the GNLF movement under Ghising had started. Bethany mentions the Darjeeling elites, but should have recorded their total abdication of moral responsibility to act as the conscience of Darjeeling by surrendering to the leader in charge at any given moment. Those who chose to stand up were killed (Madan Tamang being the most glaring example) or were exiled. Even law was not allowed to run its course to apprehend the murderer/s.

Miriam Wenner writes in the same vein by arguing that the demand for Gorkhaland is a 'virtuous movement', distinct from party politics and private pursuit. At the same time, she brings in what she calls 'the art of camouflage' to hide 'dirty politics'. For example, GJM performs 'peace puja' in order to violently stop GNLF meeting. On

the other hand, she presents frank statements from her informants about gratifying their own ambitions while Gorkhaland seems to be on the backburner. It is an interesting insight into the nature of the statehood movements as they dragged on. The author is wrong in identifying TDP with Telangana; it was Telangana Rashtriya Samiti (TRS). Mona Chettri, analysing the unfolding of the Gorkhaland movement in its various phases asserts that 'the rowdies of Darjeeling are a subaltern political phenomenon and a part of the distinct political culture of the hills'. The failure of the development state and relentless poverty turned the multitude into a fodder to be used by the leaders. While her use of 'the rowdies' phenomenon to contextualise the 'mutually reinforcing issues of underdevelopment and a violent political culture' is unexceptionable as a general statement, it is difficult to accept that this phenomenon is unique to Darjeeling. The mobilisation of what once was known as the lumpen elements to do the dirty work is seen everywhere in south Asia. The plains of West Bengal witness this everywhere. Darjeeling did have pluralism in politics. Rowdies or musclemen were not unknown, but they were used by the politicians. Now criminalisation of politics makes it difficult to separate the 'rowdies' as a different category. She uses a lot of theory and her arguments are strong. I would, however, argue that it is not unique to Darjeeling just as the experience of underdevelopment and poverty is shared by other districts of northern and south-western West Bengal and other parts of India. In effect, Wenner and Chettri have a lot of overlap in their exploration and take a cynical, if also realistic, view of the low level of opportunistic politics that have unfortunately characterised the movement for autonomy/ statehood. It would have been more useful to see a good analysis of the impact of the ' politics of bandh' or this criminalisation on the common people and their responses which are silenced with the help of the 'rowdies'. This 'politics of silence' in a period of apparent 'freedom' is a paradox that has characterised the politics in Darjeeling during the last three decades.

Nilamber Chhetri has written an excellent essay on ethnic associations in Darjeeling from the early 20th century and its new trajectories over the last three decades or so. The basic issue of a

surge of ethnic movements in Darjeeling does touch upon the issue of ethnic politics in Nepal. This was hinted at by the editors in the introduction, but this has not been dealt with in this essay. Recent analysts have commented on 'the dialectic between caste Hindu culture and the non-caste tribal subjectivities that interrogate the dominant cultural hegemony in the region.' Through meticulous research, Chhetri has found evidence of the early ethnic organisations. The early associations of Mangars, Gurungs, Limbus, Khas etc. focused on social welfare and cultural preservation. This is the only essay which privileges the Nepali language as the unifying force for an inclusive Nepali identity. Even if Nepali emerged as the accepted lingua franca, the other languages remained significant. Parasmani Pradhan also wrote, 'We are all Nepalis. Yet by Nepali we mean the assemblage of various peoples ('janajati')- Newar, Gurung, Rai, Limbu, Tamang, Bhutia, Lepcha, Sunwar etc. ...We cannot afford to forget our own languages'. (Pradhan, 1982, 38).

Chhetri writes that the emergent Nepali community in Darjeeling represented 'diverse ethnic groups such as Mangar, Gurungs, Newars, Jogis, Yakhas, Khambu Rais, Limbus, Sunuwar, Thami, Khas, Tamangs, Bhujels and others. Given this history, there was a conflation of jati (ethnic) and jat (caste) identities'. The question of identity among these groups (what Chhetri calls 'belonging') found both Nepali and Gorkha as labels. Associations, newspapers were beginning to be prefixed by the term Gorkha by the beginning of the 20th century. New ethnic associations started coming up in the 1990s. He has given a list of 16 such contemporary ethnic associations, of which 15 were set up between 1992 and 2008. It would seem that this late surge was related to the impact of the Mandal Commission in the early 1990s and later to the demand for recognition as scheduled tribes (as Ghising demanded the sixth schedule status for the Darjeeling hills). Thus what started as a socio-cultural quest was transformed into a political act. Even then, problems may persist within these groups. During a survey in the late 1970s we found in Takling, a predominantly Tamang village (near Takdah), people speaking only the Tamang language which neither I nor my Nepali companion (a Newar) could follow and we required an interpreter. Likewise there are Tamangs in other

villages who still practise *'bon'* religion, while most of the Tamangs are Buddhists. Thus there could be multiple markers for the same ethnic identity. Chhetri argues that there is a renegotiation of identity dependent on 'varying claims of authentic heritage, culture and religion'. He concludes that this 'interface between civil and political concerns represents the changing contours of ethnopolitics in the hills'. What he does not mention is that a clever use of this ethnopolitics by the government might in the future lead to a fragmentation of the Nepali/Gorkha identity, perhaps resulting in an entirely different kind of ethno-politics. As T.B.Subba mentions in the brief 'Afterwords' in this volume, 'More districts and development boards may be created by the state, but such a piecemeal approach will not be able to address the complex issues of Darjeeling.' Kumar Pradhan also raised questions about the dynamics of what he called 'micro-identities' in his M.C.Regmi Lecture (2004). He was anxious about its impact on the future of Darjeeling politics. While Chettri is ostensibly analysing ethno-politics among the Nepalese, it is curious that the Lepchas do not get any attention. No discussion on ethno-politics, its history, present and future, can be complete without reference to the long struggle of the Lepchas in Darjeeling to establish their identity.

Swatahsiddha Sarkar and Babika Khawas should be commended for thoughtfully taking up the works of Kumar Pradhan, the best known historian from Darjeeling for analysis. They have analysed his works in English and Nepali and seek a class analysis of the 'Nepali National Identity in Darjeeling'. I have a problem with the addition of 'National' to this identity. An essay of Pradhan, written in 1982 has been privileged over his other writings. Use of *sarvahara barga* had a particular nuance. It referred to the literally dispossessed to denote the immigrant Nepali community in Darjeeling. Pradhan argued that the absolute majority of the people of Darjeeling were workers and proletarian. Escaping from the increasing feudal exploitation in Nepal, they were prey to relentless colonial exploitation in Darjeeling. The emergence of an identity evolved from the need to construct 'us' as different from other linguistic and ethnic groups (mainly from the plains). The context was quite different in Darjeeling which led to the search for commonalities. Nepali emerged as the *lingua franca* of the

area. Tribal exclusiveness and languages were gradually shed to produce an inclusive Nepali/Gorkha identity. Pradhan wrote, 'The non-caste federated tribal society of Nepal was transformed into a caste society' (Subba, 2014, 202). Yet, caste distinctions were much less rigid among the immigrants in Darjeeling than in post-unification Nepal. The 'tagadhari' -'matwali' binary was far less prevalent and effective socially in Darjeeling. The problem lay in the process of this transformation. Kumar's quest was to unpack the processes which led to the formation of an inclusive Nepali/Gorkha identity in Darjeeling. Class formation later is a subject which has not been adequately addressed yet. Kumar admittedly did not address it; nor did he seek to evolve a 'theoretical proposition'. In his M. C. Regmi Lecture (2004), he also analysed the contradictions within this identity that he had elaborated, perhaps in a little simplistic way, earlier. Here he addressed the dynamics of the relationship between the larger Nepali identity and the separate ethnic/tribal identities. This latter identity he characterises as 'janajati'. My disagreement with a few points that the authors make should not detract from the value of this essay. The 'class question' is significant, but Kumar addressed it from other angles. The very fact that the ethnic groups of eastern Nepal were obliged to migrate into '*Muglan*' made them 'dispossessed' almost from the moment of their journey.

The final section on environments and labour has three essays. Sarah Besky studies the brief career of Darjeeling Tea Management Training Centre which was set up to entice educated Nepali youth to the management jobs in the tea gardens. She uses 19th century texts which sought to attract the British youth to these jobs and juxtaposes them with what the DTMTC was doing now. She feels that the DTMTC was an attempt to 'reconcile the tension between an aspiration of economic development and an aspiration of ethnic recognition.' I have not been able to make much of the essay. The organisation failed, but the issues remain. In 1973 a centre for training students from the hill sub-divisions for competitive examinations was opened at Darjeeling Government College. It was later absorbed by the DGHC/GTA. Over the years it has produced a number of members in the West Bengal Civil and Police Services and a few of them joined the Central services

as well. This should have resolved the 'tension' the author seems to be so concerned about. The roots of the 'tension' are very deep and superficial attempts to understand them may be counter-productive. The second essay by Georgina Drew and Roshan Rai begins by looking at the precarious water supply situation, but examines more the role of the local *samaj* in providing alternative sources of supply to its members. They have looked at three small localities in Darjeeling-Muldhara, Jawahar Busti and Mangalpuri. It has a wealth of theoretical understanding on '*samaj* affect', but very little on water. Is the experience of just three settlements enough to generalise? The anxiety that the springs from which the *samaj* collected water are susceptible to cross-contamination is not happy news on the environment front either. Rai had earlier co-authored an essay on tea and social justice in Darjeeling, which was not caught in the quagmire of theories. He could have addressed the vexed problem of availability of water in Darjeeling differently.

Debarati Sen examines women's entrepreneurial role in the context of Fair Trade initiative in rural Darjeeling. She studies women producing organic tea on small scale with the help of NGOs by forming cooperatives. She has tried to show how 'women's collective agency in rural Darjeeling is emerging within market-based production systems and how they navigate inequities'. She is the only author to pay attention to the gender issue. She has presented a detailed and nuanced narrative of the involvement of women in smallholder tea production.

The book comprises eleven well-researched essays by young scholars from four continents; some of them seem to be from Darjeeling. The early history of Darjeeling has been traced, though the larger international political, strategic and economic perspective behind the acquisition and development of Darjeeling has been, one may argue, inadequately addressed. Neither has the quest of the people of the hills for autonomy from the beginning of the last century been properly analysed. Why did the GNLF movement succeed in drawing attention which earlier efforts did not? Was it violence? This crucial question has neither been raised, nor analysed. What is noticeable is the silence on the language movements. A militant movement in 1961

led to the recognition of Nepali as the official language of the three sub-divisions in the hills. The All India Nepali Bhasa Samiti led movement for inclusion of Nepali in the eighth schedule has also been ignored. In 1979, in response to the Prime Minister's reference to Nepali as a foreign language, I.B.Rai, the President of the Bhasa Samiti, publicly asked, 'You will take our land, but not us?' This equation of territory, language and people provided the context for new mobilisation which Ghising later exploited. Tea and forestry, agrarian economy, environmental issues and gender have not been given much space. The political tradition that evolved in Darjeeling drawing the people to national issues like the freedom struggle has not been discussed in any of the essays. While the problem of labour has been invoked by several authors, there has not been any reference to the rich history of trade union movements here. Men like Dal Bahdur Giri (a non-cooperationist), Dambar Singh Gurung (founder of the Gorkha League and a member of the Constituent Assembly), Ratanlal Brahmin, Bhadrabahadur Hamal, Madan Thapa, T. Manean are almost totally absent in the narrative. How do we grasp the politics of Darjeeling today, if we erase the memory of earlier popular movements in the region? These movements always had an element of identity politics in them. The editors wish to 'introduce Darjeeling to postcolonial thinking and, in turn, to explore what this critical tradition might teach us about Darjeeling today.' Ignorant and agnostic as the present reviewer is, he fails to see how this critical thinking has thrown special light on the history and politics of Darjeeling. What theory has been invoked in some essays, obfuscate rather than tease out a new meaning. That Darjeeling, for long, nurtured and celebrated cosmopolitanism is curiously absent in the book.

There are some inaccuracies which the editors should have taken care of. We might just refer to two- the reference to 'Nepal's Gorkha Empire' (Nepal was a kingdom) or to a Chief Minister in 1892. The editors' hope that 'this book is underwritten by the possibility that reconsidering Darjeeling's past and present may, in time, prove a vital step towards reimagining its future' is touchingly naive. The book does not provide enough of a perspective to help 'reimagine' the future. And if what has been written in this book about the politics

of Darjeeling now is correct, it is not very likely that the leaders would want to be directed by the findings of historians and social scientists. The book is a welcome addition to the small corpus of truly academic books on Darjeeling. One, however, waits for a good monograph on the history of Darjeeling.

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Subhas Ranjan Chakraborty

Vedalakṣaṇa Texts : Search and Analysis, edited by Nabanarayan Bandyopadhyay, National Mission for Manuscripts, 11 Man Singh Road, New Delhi - 110001. pp. xvii+314. Rs. 600.

The book is a valuable collection of selected research papers presented by reputed scholars at a National-level Seminar held at the School of Vedic Studies, R.B.U., Kolkata.

As the term *Vedalakṣaṇa* is not very familiar with many, the editor himself and also a few other contributors have quite appropriately made its meaning clear at the very outset of their respective articles. Accordingly any ancillary work showing the characteristic features regarding phonetics, grammar (cf 'lakṣya-lakṣaṇe' — Paspaśā-Patañjali) and the like of a particular Vedic text is a *lakṣaṇagrantha*. One can have a list of such 1619 granthas in K. P. Aithal's *Vedalakṣaṇa* : *Vedic Ancillary Literature* : A *Descriptive Bibliography.*

The book under review opens with a foreword from V. V. Reddy, Director, NMM followed by an introduction by N. N. Bandyopadhyay, Director, School of Vedic Studies. Then follows the main part consisting of twenty-six articles in all on various topics.

The first article is a key-note address by T. N. Dharmadhikari dealing, only in a general way, with peculiarities in the matter of pronunciation, rituals etc. existing in different Vedic texts with apt illustrations.

B. B. Chaubey in his *Importance of Editing Vedic Lakṣaṇa Texts* presents definitions and descriptions of different kinds of *stobhas* (intercalated syllables, words etc. in Vedic musical chantings) which will definitely help the learners as the subject is less known and discussed. One may, however, not agree with his assumption that the germ of stobha is discernible in the words 'ṛkvatā' and 'suṣṭubhā' (*RV.* 1.62.4, IV. 50.5), at least in its technical sense.

Dipak Bhattacharyya's *Lakṣaṇagranthas in solving exegetical problems of the A V.* is really a very interesting and enlightening article. He has very distinctly demonstrated how the Lakṣaṇagranthas *Bṛhatsarvānukramaṇikā* and *Pañcapaṭalikā* help us to decipher the correct sense of the *AVS* xix. 23 (esp. verses 1-22), where Sāyaṇa, Whitney and Lanman grope in the dark, falter and resort to wild guesses. He has also incidentally contended, not on any feeble ground, Surya Kanta's view of replacing the name of prātiśākhya by prātisaṁhitā.

Also with great satisfaction we note in C. M. Neelkandhan's article *Vedalakṣaṇa Texts and Tradition* of *Kerala* that students in Kerala (also in some other states), even in the present century, are admitted at the age of seven or eight and taught the Vedas in the traditional way. The particular gestures of their hands during chanting indicate the final syllable of each individual word of the mantra concerned. This is something notable. Another very important information which we

gather from the article is that the writer is going to edit Nārāyaṇīya (or Dīpaprabhā), an unpublished commentary on *Sarvānukramaṇī*. We eagerly await its publication and offer him our heartfelt thanks in advance.

Thanks are also due to N. R. Kulkarni who informs us in her article that she is getting prepared to edit and publish *Śabdabrahmavilāsa*, a hitherto unknown commentary on the *T.Pr.*

S. R. Banerjee rightly observes in his *Phonetic Studies in Ancient India* that a complete knowledge of any language is possible only when due attention is paid to synchronatic, diachronic, comparative and psychological aspects. He also asks the readers to always keep in mind the five essential parts of grammatical study i.e. phonology, morphology, syntax, semantics and ecology. He has nicely explained that *nara+am=naram* only because of the fact that one of the concerned vowels is *Saṁvṛta.*

Of the other articles B. P. Bhattacharyya's *Nature* of *Vivṛtti,* Didhiti Biswas's *An Introduction to Nāradīya Śikṣā,* Taraknath Adhikari's *Lakṣaṇagranthas* of *the AV.,* Mau Dasgupta's *In Search* of *Lost Maṇḍukeya Tradition,* Parboti Chakravartti's *Nature* of *Anunāsika* also deserve due attention and appreciation. One willing to have a sight of the abstruse Sphoṭa theory may have it somewhat lucidly treated by K. S. Das in his *A Revisit to the Sphoṭa Theory.* Srikrishna Sarma's *Pāriśikṣā* is the only article written in Sanskrit language and an important one as it deals with a text not easily available.

The last article entitled *Sandhikārikā* is from the pen of the editor N. N. Bandyopadhyay himself, wherein it is disclosed that he is engaged in editing an unknown text on Vedic *sandhi* written by one Ganeshadatta together with the latter's own commentary. When published it would be an important addition to the Vedic studies.

All the articles in the collection have their own merits and importance except only one or two which lack some clarity and cohesion, though not wanting in any kind of zeal and zest. Some printing mistakes have crept into the book and only a very few of them may create a little confusion. Sequence of the articles could have been made otherwise but that does not reduce the value of the book in any way.

Sincere efforts on the part of the energetic editor to collect, edit and publish such valuable and varied articles are commendable indeed. He deserves a lot of thanks from all concerned. The vast area of *lakṣaṇagranthas* still remains mostly untrodden and so it is quite expected that the book would help the scholars in planning out their future research projects in this field by showing them the avenues and ways of approach. The collection is worth purchasing and preserving.

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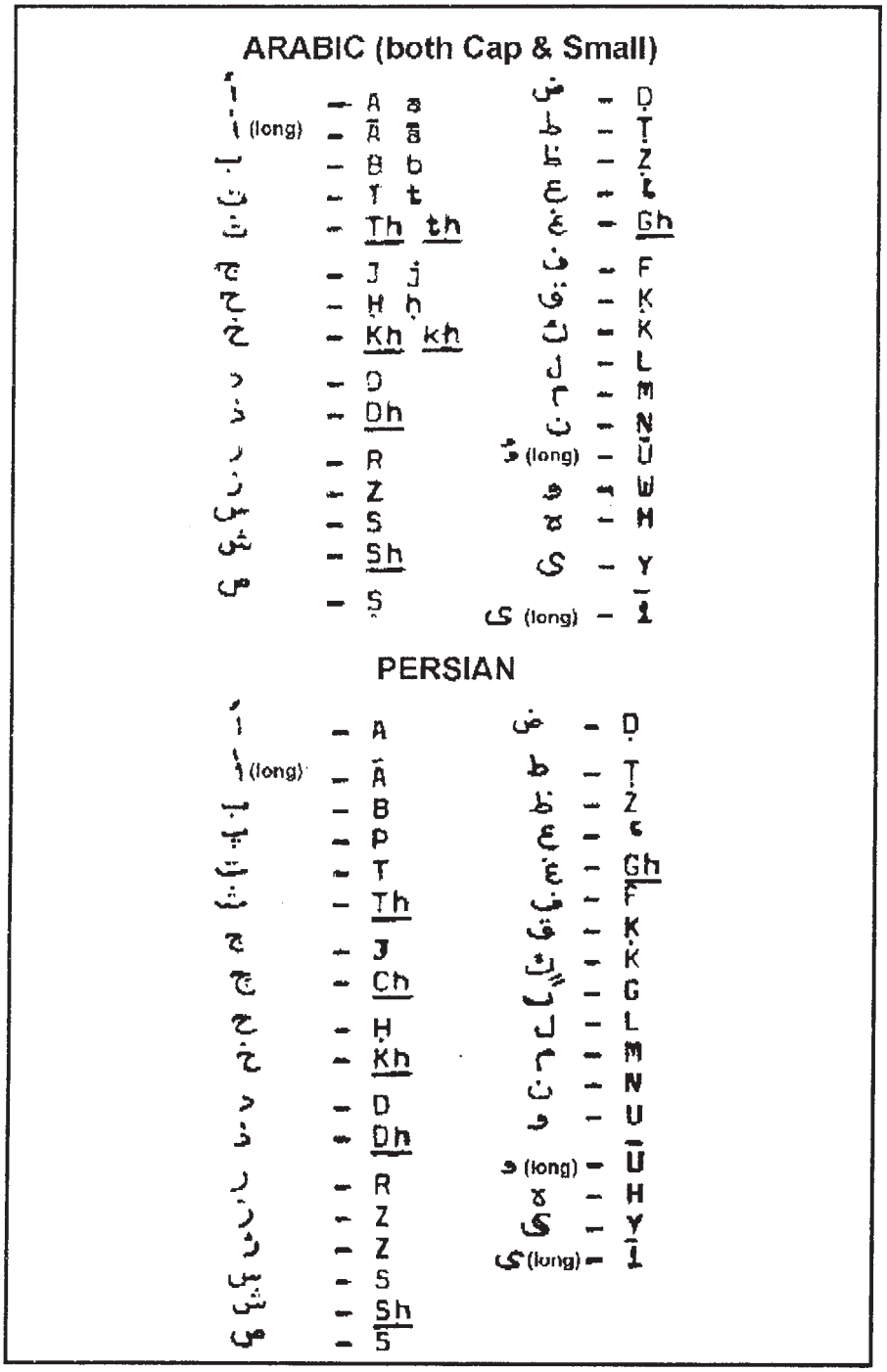
SANSKRIT

आ = ā	ई = ī
ऊ = ū	ऋ = ṛ
ङ = ṅa	च = ca
छ = cha	ञ = ña
ट = ṭa	ठ = ṭha
ड = ḍa	ढ = ḍha
ण = ṇa	श = śa
ष = ṣa	ं = ṁ

TIBETAN

ཀ = ka	ཁ = kha	ག = ga	ང = ṅa/nga
ཅ = ca	ཆ = cha	ཇ = ja	ཉ = ña/nya
ཏ = ta	ཐ = tha	ད = da	ན = na
པ = pa	ཕ = pha	བ = ba	མ = ma
ཙ = tsa	ཚ = tsha	ཛ = dza	ཝ = wa
ཞ = zha	ཟ = za	འ = 'a	ཡ = ya
ར = ra	ལ = la	ཤ = śa/sha	ས = sa
ཧ = ha	ཨ = a		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Sir William Jones
on the publication of the Asiatic Society

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