



A. Laxmi

ADINATH LAHIRI

(1916-1975)

Elected F.N.I. 1960

ADINATH LAHIRI was born on August 24, 1916 at Pabna (now in Bangladesh). His father, Anadinath Lahiri was Special Magistrate (1st Class) there. His mother Smt. Suprava Lahiri is living in Hazaribagh.

Adinath Lahiri received his education in the University of Calcutta. He obtained his B.Sc. (Hons.) in Geology in 1936 and M.Sc. (Geology and Geochemistry) in 1938, from the University of Calcutta.

In 1938, Lahiri went to London University for his doctorate on a '*Sir T. N. Palit Foreign Scholarship*' of the Calcutta University. He was awarded the Ph.D. degree in 1941 and also the '*Judd Memorial Prize*' of Imperial College of Science and Technology for the best thesis in Geochemistry. He also secured the Diploma of Imperial College in 1942.

PROFESSIONAL CAREER

He began his professional career as a Research Associate in the Imperial College of Science and Technology in 1942 and was Scientific Officer, and later Head, of the Fuel and Oil Research Section of the Royal Aircraft establishment, Farnborough, U.K., during the Second World War. At the invitation of the late Dr. S. S. Bhatnagar, Dr. Lahiri joined the Council of Scientific and Industrial Research (CSIR) as Assistant Director (Planning), Central Fuel Research Institute (CFRI) in 1945. In 1946, he married Kohinoor of the Natore Raj family. They have two sons. The elder, Dr. Abhijit Lahiri, is doing M.R.C.P. in London; the second son Shri Ranjit Lahiri is studying Mechanical Engineering at the Birla Institute of Technology, Mesra, Ranchi.

Dr. Adinath Lahiri became the Deputy Director of the Central Fuel Research Institute in April, 1953 and Director in April 1954, from which post he retired in 1974. After retirement he took up the assignment as UNDP Adviser to the Republic of Chile, South America. He breathed his last due to Cardiac failure on 26th August, 1975 in London on his way back to India after completing a year's UNDP assignment.

CONTRIBUTIONS TO COAL TECHNOLOGY

Following the first Director of CFRI, Dr. J. W. Whitekar, Dr. Lahiri organised, counselled and guided the Research and Development activities on fuels in India



in a systematic manner. The Institute in its early days included liquid fuels as a field of study. Subsequently, when the plan for setting up an exclusive institute for liquid fuels was given final shape and the Indian Institute of Petroleum was set up at Dehra Dun in 1959, the CFRI under the guidance of Dr. Lahiri concentrated its attention on coal science and technology. Similarly, plans for the establishment of a Central Mining Research Station to deal with the mining problems of coals and other minerals were also formulated by Dr. Lahiri at CFRI. Since its inception, the Institute initiated systematic physical and chemical quality assessment of the working seams and cores of the bore holes drilled by the various exploration and coal producing organisations, through seven field laboratories established in the various coal fields of the country. These data have been useful in planning the development and utilisation of the national coal resources. The survey helped in the identification of over 1300 million tonnes of new resources of coking and blendable coals. The survey also indicated that beneficiation of coking coal is essential for efficient utilisation. Dr. Lahiri and his group carried out intensive researches on this aspect and the results of these studies have been utilised in setting up 9 public sector coal washeries, with installed capacity of 30 million tonnes annually. The studies of Dr. Lahiri and his collaborators have led to many improvements in washing technology, some of which have been internationally adopted.

Dr. Lahiri and his group at the CFRI carried out valuable work on the preparation of coal for charging into coke ovens, and blending of coals of different coking potential, so that maximum conservation of the prime coking coal is possible. The investigation was carried out from four angles : (i) judicious use of prime coking coal, (ii) up-grading of inferior coal, (iii) using sub-standard coking coals in blends with superior grade coking coals and (iv) adopting improved iron and steel melting techniques. Indeed, the coal blends used in public sector steel plants and merchant ovens often using up to 50 per cent non-stand plants, are those selected on the basis of laboratory and pilot scale experiments carried out at CFRI. Dr. Lahiri and his group devoted considerable attention since 1964 to the development of technology of using non-coking coals for the production of blast furnace fuel. On the basis of these researches, the first commercial-cum-demonstration coke plant of 350 tonnes daily capacity has been recently set up. If successful, this will go a long way in expanding iron and steel industry since non-coking coal is available in about eight States and iron ores occur practically all over the country.

Dr. Lahiri and his colleagues at CFRI developed a new Beehive Coke Oven design which nearly trebled the productivity of the existing ovens with consequent economic advantage and lowering the cost of production.

The CFRI under the leadership of Dr. Lahiri has made significant contributions to the development of technology for processed fuel for home and industry. Methods for converting low grade coals, both coking and non-coking, which are abundantly available, into processed solid fuel, were developed. A simple moving devolatilizer, without recovery of byproducts to produce domestic fuel is already commercialised. Similarly, two processes which employ coke breeze, coal fines, slack coal, etc., and plants of 100 tonnes/day capacity for producing acceptable quality of domestic fuel are being established.



A narrow brick vertical retort has been developed for large scale production, for low temperature carbonisation technique, wherein external heating of the coal with or without internal recirculation of gaseous products to increase productivity of the ovens is adopted. A plant of this model of 1500 tonnes daily capacity, using coals of the Raniganj area is being set up near Calcutta to provide solid and gaseous fuels to the Calcutta Metropolitan area.

Dr. Lahiri also carried out valuable work on the isolation and recovery of useful chemicals from the by-product coal tar and gases both from high temperature carbonisation and low temperature carbonisation of coals. Processes have been developed for production of useful products like resins, phthalic anhydride, anthraquinone, maleic anhydride, xylenes, cyanopyridines, nicotinic acid, isonicotinic acid, benzaldehyde, benzoic acid, benzonitrile, phthalonitrile, cresols, naphthol, resorcinol, etc. Active carbon and ion exchangers for determination of water-based coal were developed. Some of these processes have found industrial application in the country.

Dr. Lahiri guided another group at CFRI for the development of technologies for conversion of coal to gas and liquid fuels. Major pilot plants such as high pressure fixed bed gasification unit of capacity 800 kg/hr and a Koppers-Totzek plant of 6000 cu. ft. of gas out/hr have been set up at the CFRI campus and several varieties of non-coking Indian bituminous coals have been evaluated in these plants. Investigations were also carried out for the direct hydrogenation of coal for synthetic liquid fuels and it was found that North Assam Majum coals could be converted to liquid fuel to high 95%. These studies have led to the formulation of a major feasibility report for establishing a coal to oil plant of 66,000 barrels capacity per day.

Under the leadership of Dr. Lahiri, the CFRI has established facility for high pressure vapour phase catalytic hydrogenation unit (100 gals/day) for production of synthetic fuels from tar.

Amongst other important contributions of Dr. Lahiri and his group at CFRI is the effective use of coal even up to 50% inerts in the thermal power stations. Since about 50% of the coals fed to the washeries resulted in high ash by-products, the use of such low grade coal at the thermal power stations has made coal beneficiation in the country economic.

Dr. Lahiri has guided fundamental researches on the techniques of hydrogenation, pyrolysis, etc., which have led to basic knowledge on the state of combination of carbon and hydrogen in the coal molecule. Dr. Lahiri has also made valuable contributions in petrography, mechanism of oxidation, solvent extraction, surface chemistry of coal and catalysts and adsorbents.

Reputed internationally as a fuel scientist and an authority on coal, Dr. Lahiri was greatly responsible for making the CFRI a premier institute in the world for research in fuel science and technology.

Dr. Lahiri had a deep passion for conceptual planning for the development of projects of integrated coal-based industrial complexes. In industrial planning, the Durgapur Industrial complex in West Bengal is an example of his conception. Earlier in 1954 and later in 1965 on the Energy Survey Committee and subsequently in 1974 in the National Fuel Policy Committee, he took a leading part in formulating the National Fuel Policy of the country.



HOBBIES

Dr. Lahiri kept himself intimately in touch with nature. He was deeply interested in the habits and behaviour of the panther and leopard. Although he shot a few wild animals in his early days, later he never shot any animal but found much delight in photographing animals in the forest under natural conditions.

Dr. Lahiri was fond of gardening and agriculture. In his residence at Hazaribagh (Balaka) he grew many varieties of roses and orchids collected from different parts of the world.

Children's education was uppermost in the mind of Dr. Lahiri. The present Mount Carmel School for girls and boys at Digwadi had its origin due to the untiring efforts and interest of Dr. Lahiri. Similarly, Dr. Lahiri was interested in the welfare of his workers in the Institute and spared no pains in helping them.

HONOURS

Dr. Lahiri was associated with a large number of technical committees and visited various countries as a member or leader of technical delegations. He was a fellow of a number of academic and professional institutions in India and outside including the Indian National Science Academy, Institute of Engineers, Institute of Fuels (London), etc. He was awarded Padmashri in 1960 and Padmabhushan in 1969. For several years, he was a Director of the National Coal Development Corporation. He had to his credit about 90 patents. During his active scientific career (1947-1973), he published 591 papers and reports along with his collaborators (list attached).

The monumental contributions of Dr. Lahiri to Coal Science and Technology at the CFRI, Dhanbad, Bihar will be well remembered by the entire future generation involved in solving the energy problems of the Globe.

SATYAPRASAD RAYCHAUDHURI

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Note : The account of the scientific work of Dr. A. Lahiri is largely based on the paper entitled, "Dr. A. Lahiri, a Profile of Contribution to Fuel Science Technology" by S. Ranga Raja Rao, *FRI News*, **25**, No. 3, Silver Jubilee, September 1975, 77-78, 89.



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