



# CFRI NEWSLETTER



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Established in November 1946, Central Fuel Research Institute is a unique Institute of its kind in India under CSIR, New Delhi to conduct research in different areas of Fuel Science and Technology with emphasis on coal and lignite.

**Mission:** Enhance the position of the Institute as a premier R&D centre for technology development and transfer by forging strategic alliance with other agencies and continuously strive for excellence in the area of potential expertise for generation of basic knowledge, innovation, and advanced concepts in science and technology for economic, efficient, and environmentally safe energy management

## UNCERTAINTY AND NEED FOR QUANTITATIVE APPROACHES IN COAL RESEARCH *(Abstract: CSIR Foundation Day Lecture delivered by Prof. Arabinda Ghosh, Dept. of Geological Sciences, Jadavpur University, Kolkata on 26<sup>th</sup> September 2003)*

Nature is supreme and man has realised that from the early age of human civilisation. The society has accepted natural phenomenon and happenings with great awe. Art is describing nature through various forms whereas science is trying to interpret. Technology at the crossroad is doing its best to improve the quality of life through sustainable development.

The word **uncertainty**, synonymous with nature is indeed fascinating and may need long hours to describe, argue and reach a coconscious. Nevertheless, it always has a negative impact on the society and the outcome is fear, loss of confidence, voodoo and priest crafts, etc. and finally insurmountable exploitation. Now we accept something **Science** that must have reproducibility and repeatability. When we talk of quantitative study and accuracy of the result in the same breath, do we really practice serial and or parallel operation of the same experiment we have designed and performed? Will the data be reproducible

irrespective of space and time?

There lies the question and the fear of uncertainty at the backdrop is playing the ugly and latent role of resistance to the noble cause of revealing truth of nature. Validation and standardisation of quantified data is the call of the day and although we have ignored this promise, a group of data analysts essentially called Statisticians have never remained idle. To the contrary, they have put forth some unique methodologies, which enable to decipher the genuineness of data even like DNA tests. The procedures are robust and easy to handle. We can precisely determine error coefficient, required sample size, bias, filtering etc. and standardize vis-à-vis validate the generated data, free from bias and uncertainty complex.

Prima-facie observations on analytical study of some areas of coal research have clearly revealed that there is an eminent need for a thorough review of the situation. Apart from taking corrective measures on analytical techniques, standards and instrumental limitations, validation of data applying statistical techniques like ANOVA,  $D^2$ , etc. tests could be the panacea of mistrust and propensity towards error. This approach can upgrade the status of data generation and increase the level of confidence amongst the fellow scientists.

In the age of electronics and instrumentation, there is a need for faster, cheaper and robust technologies for physical, chemical and other tests depicting industrial quality and management of coal from handling to end-use sectors. There is a communication gap between the coal scientists and instrumental technologists in our country. This can be easily observed when we find that the foreign companies market analytical instrument in a barely open area of zero competitiveness. We the Indians have generated Silicon Valley still we are at the backbench in our own country.

A frequently asked question within the community is whether man-machine war could really be a possibility and who will establish the supremacy if such thing happens. There is a silent war already in the mind and we often try to prove the data produced by a machine is more reliable than that by human experts.

The real time situation need to be thoroughly discussed and I am obliged to you for giving me the opportunity in the right place and possibly in opportune time to focus some of my observations, including wild thinking on improving the quality of coal research in the age of globalization.

Thank you.

### **LECTURE AT CFRI**

1. Shri Ranjit Gupta, Eco-Coke and Power Ltd., Bangalore delivered a lecture on 'Commercialization of R&D Technology' on 10.07.2003.

2. Shri M. Das, Ex-Director (SG), Geological Survey of India, Kolkata delivered a lecture on 'Regional Exploration for Solid Fossil Fuel in Twenty First Century: Conception and Perception' on 04.09.2003.

3. Dr. N. K. Singh, Medical Superintendent, Railway Hospital, Dhanbad delivered a lecture on 'Prevention of Heart Attack is Possible' on 25.09.2003.

### **PAPER PUBLISHED**

1. Srivastava S.K, Recovery of Sulphur from very High Ash Fuel and Fine distributed Pyretic Sulphur containing Coal using Ferric Sulphate, Fuel Processing Technology 84 (2003) 37 - 46

2. Maity S, Mukherjee J., Mitra S., Moitra H. B., Singh R., and Ghosh G., Quantitative Estimation of Mineral Matter in Some Indian Coals using Interactive Rietveld-based Full Profile X-ray Diffraction Technique, Current Science, Vol. 85. No. 4, 2003, 506-510

### **VISIT OF PARLIAMENTARY COMMITTEE ON OFFICIAL LANGUAGE**

Three members team of Parliamentary Second Subcommittee on Official Language visited CFRI on 16<sup>th</sup> July 2003. The team was headed by Hon'ble MP, Shri Bal Kavi Bairagi and other members of the team were Hon'ble MPs, Shri Tilak Dhari Singh and Shri Kuwar Sarbraj Singh. This committee reviewed the progress made by the Institute with regard to implementation programmes of official languages in the day to day official work. The committee instructed some guidelines to be followed in the future. In fact this committee has visited Dhanbad after a long span of time of 23 years.



Honorable members of the committee at CFRI

### **WORKSHOP ON SCIENCE JOURNALISM**

A four-day workshop on Science Journalism/writing through Hindi medium was organised from 23 to 26 July 2003. This workshop was conceived and financed by National Science and Technology Communication Council, New Delhi. Prof. N. K. Chatterjee, former Vice-Chancellor of Vinoba Bhave University, Hazaribagh, inaugurated the workshop. Shri Pradip Srivastava, Scientist, CDRI, Lucknow; Shri Walter Bhengra, Doordarshan, Ranchi; Shri Sudhir Pal, Ranchi Express daily, Ranchi; Shri Vinay Bhushan, Prabhat Khabar daily, Dhanbad; Shri S. L. Singhal, Correspondent Hindustan daily, Dhanbad and CFRI personnel delivered lectures for the participants. Forty-seven participants from different places/organisations participated. Participants also visited the office and workshop of Prabhat Khabar

daily and Jamadoba mines. Dr. Manoj Patairiya, Director, NSCTC was present throughout the workshop as observer.

### ALTERNATIVE FUEL CONSCIOUSNESS

CFRI has started planting of trees of Neem, Karanj and Jatropha in the CFRI colony campus on barren lands/wasteland/road side land. For this the occasion of Independence Day was chosen (15 August 2003). The purpose of growing such plants is to get the seeds, which can produce oil, meant for extraction of bio-diesel to be used in the motor engines. The sapling will take 6-7 years to have flowering and to bear the seeds for the oil. This initiative was taken as awareness programme about the alternative fuel consciousness for future. This small effort may lead us to reduce the import of oil for our motor engines.



Dr Kalyan Sen, Director, CFRI planting a sapling of a Karanj in the office campus on 12.08.03. Other staff members are also seen.

### INDEPEDENCE DAY CELEBRATION

Fifty-seventh Independence Day was celebrated with full enthusiasm and fervour. Dr Kalyan Sen, Director, CFRI hoisted tricolour at 9.00 a.m. sharp in front of main building. A big gathering of staff members and schoolchildren were present to witness the occasion. Children were carrying tricolour flag in their hands. Dr Kalyan Sen delivered the Independence Day speech highlighting the main achievements of the Institute during last year. Sweets were distributed to the children at the end of the programme.

### HINDI PAKHWARA

Hindi Pakhwara was inaugurated on 15<sup>th</sup> Sept. 2003. Shri Shreenath Singh, Sr. Hindi Officer, BCCL, Dhanbad and Secretary, Dhanbad Official Language Implementation Committee was the chief Guest of the function. A Kavi Gosthi was organised in which

S/Shri Brijendra Kumar, Shree Ram Dube, Basant Joshi, Fazihat and Sushri Vinita Thakur participated.

### RESEARCH COUNCIL MEETING

Research Council meeting was held on 26<sup>th</sup> September 2003. This meeting was the last meeting of the members of RC constituted for the term of three years. Dr R. Natarajan, Prof R. S. Saha, Shri S. Chattopadhyay, and Shri B. N. Pan attended this meeting. All the members of R.C present were given hearty send off. Dr. Kalyan Sen, Director, CFRI thanked all the members for their service, support and guidance, and gave mementoes to them.

### DEPUTATION ABROAD

1. Shri S. Biswas, Scientist, Coal Combustion visited Australia from 8 to 13 September 2003. He attended AIMEX-2003 and also had meeting with coal delegation of private and government agencies in Australia.

2. Dr Kalyan Sen, Director visited USA from 15 to 19 September 2003 to attend Twentieth Annual International Pittsburgh Coal Conference and presented two research papers. Dr. A. K. Singh, Scientist also attended the conference.

### CSIR FOUNDATION DAY

Prof Arabinda Ghosh, Professor of Geology, Deptt. of Geological Science, Jadavpur University, Kolkata delivered CSIR Foundation Day Lecture on 26<sup>th</sup> September 2003. His topic was 'Uncertainty and Need for Quantitative Approaches in Coal Research'. Prof. B. Paira, Director, Heritage Institute of Technology, Kolkata was also present as special invitee on the occasion.

### PATENT INFORMATION: COAL AND ITS UTILISATION

United States Patent Application 20030041509 A1  
March 6, 2003

*Title:* Synthetic fuel comprising coal dust, water and a reactive organic compound, and a process for making such synthetic fuel.

*Inventors:* Cutright, Preston (Reno, NV); Gambino, James (Yardley, PA)

*Abstract:* The present invention is directed to a synthetic fuel made of coal dust, water and an organic chemical reactive with the coal dust to form a chemical bond with the coal dust upon compacting to provide a product very similar to coal.

(Source-[www.uspto.gov](http://www.uspto.gov))

## WORLD AROUND

### KNOWLEDGE MINING

Information overload is becoming a big problem in the chemical industry. A scientist seeking information on polyethylene (PE), for example, would obtain as many as 504,000 documents from a simple free Internet search for that term. Even use of a subscription-based scientific database, such as Chemical Abstracts or a patent database such as Derwent, would require a long time to narrow down pertinent information. Those frustrations can be eased, however, with the use of knowledge mining technology, such as text mining software, that quickly finetunes and analyses searches from multiple database, web sites, e-mail, and just about any other digital source of documents.

Chemical companies use some pretty robust IT software, but a lot of times there is information hidden in data that isn't apparent. Text mining, along with data mining - a related technology that handles numerical information - help companies sort through all the chaff and pull out the hidden information. The mining terms are in this case reminiscent of gold mining, as a prospector must sift through large volumes of dirt and dust to find the high value gold nuggets.

Data mining and text mining are very different disciplines, although their general aim is the same to gain nuggets of knowledge from a vast amount of information. Both technologies pull data from sources including 1-800 telephone numbers, customer inquiries and surveys, sales reports, web sites, e-mail and magazine articles. Data mining software aggregates such information, filters it, performs calculations on the numerical aggregates of the data based on user specifications and graphs, or "maps", in the form of an Excel spread sheet, for example.

Statistics and statistical analysis are at the heart of data mining, and chemical companies are using advanced statistical analysis to study scientific as well as manufacturing data. There are many possible ways to do something, and data mining helps companies find ways it may not have even known existed to potentially optimise production, lower costs, and increase profit.

A person can know only a small fraction of all available literature, and there is a constant stream of new data and new articles on any given topic. (Source: *Chemical Industry News*, August 2003)

### RELEASE OF ANNUAL REPORT

Dr. R. Natarajan, Chairman Research Council, CFRI released CFRI Annual Report 2002-03 on 26th September 2003.

### CFRI IN MEDIA

1. Workshop on Science Journalism (*Awaz and Prabhat Khabar* 12.07.03).
2. Review meeting for workshop on Journalism (*Prabhat Khabar* 22.07.03).
3. Workshop on science journalism through Hindi medium (*Hindustan, Prabhat Khabar and Dainik Jagaran* 24/25.07.03, *Bihar Observer and Hindustan Times* 24.07.03).
4. Sadbhavana Diwas celebrated in CFRI on 20.08.03 (*Hindustan* 21.08.03 and *Prabhat Khabar* 22.08.03).
5. Revolution by fly ash for making of bricks and use in Agriculture and Forestry (*Dainik Jagaran* 16.09.03).
6. Kavi Sammelan in CFRI on Hindi Divas (*Prabhat Khabar* 17.09.03).
7. CSIR foundation Day Celebration at CFRI on 26th Sept. 03 (*Hindustan* 27.09.03 and *Prabhat Khabar* 27.09.03).

### EVENTS AHEAD

1. Vigilance Week from 31st Oct. to 5th Nov. 2003
2. Flag Day on 25 Nov. 2003 (Communal Harmony Week 19-25 Nov.)

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