

## Seminar Session S-4

### WELCOME ADDRESS

By Sri S. Chatterjee

*President, The Association of Engineers and Chief Engineer,  
Calcutta Metropolitan Planning Organisation.*

I heartily welcome you on the last session (S-4) of the three day seminar on Engineering Materials and Equipment, 1970. During the last two days you have heard many erudite scholars who presented their very valuable papers, learned chief guests and chairmen. We have covered engineering materials concerned with masonry works, cement products, paints and coating, waterproofing compounds, treatment plant works, grouting materials, corrosion prevention, etc. Then we discussed about pumping machinery, brick making machinery, meters, valves, control equipments, etc. In today's session we are going to discuss about heavy earthmoving and earth-cutting machinery and equipment. These short sessions are not sufficient to cover all gamuts of engineering materials and equipment. On each subject several sessions are necessary. We are lighting a spark to evoke thinking on giganticity of the problem, to realise the enormity of the proposition. Rs. 150 crores earmarked for 3½ years of the IV Plan is not a tiny sum. Booking an expenditure in CMDA's account is not the end of the responsibility who has extended their helping hands to provide finance for the job. Everybody

wants benefit, everybody is anxious to see thing in three dimension not restricted only to two dimensions of planning.

To achieve this objective; to translate the ideas into action 4 M's are necessary. They are (1) Money, (2) Materials, (3) Machinery and (4) Men. We have restricted our discussion to Materials and Machinery. It is necessary to assess the quantum of various materials needed for various jobs. In the development works for Metropolitan Calcutta, 91 items have been included covering Water-supply, Sewerage and Drainage, Traffic and Transportation, Garbage Disposal, Bustee Housing and Urban Development, Low Cost & Middle Income Group Housing, special projects and miscellaneous schemes. Those projects, the report, of which have been prepared under various major heads, cover Rs. 271 crores, whereas the IV Plan investment is only Rs. 150 crores having a gap of Rs. 121 crores which has to be carried over to the V Plan. More new schemes will come up. It may be that the cost of the works, in and will be in hand will surely be more than estimated sum. Necessary progress in some schemes could not be made being logged down in the

cases of fundamental rights where land acquisition will be unnecessarily delayed.

Essential materials which are necessary for almost all civil engineering works are :

- [a] Bricks, sand, cement, coarse aggregate like jhama khoa, stone chips, stone ballast, gravels etc. and their products like R.C.C. pipes.
- [b] Ferrous materials products like steel and steel products, Cast Iron pipes, specials, valves, etc.
- [c] Ceramics—stoneware pipe, sanitary wares like pans, W. C. basins.
- [d] Electrical goods—Switches, connectors, cutouts, ceiling roses, plugs, fuses, etc., conductors, holders, etc.
- [e] Nonferrous materials & plastics—Stop-cocks, bib-cocks, small valves, etc.

1. Light Hoist for Erection of Prefabricated R. C. Panels by **Shri Mukulesh Mitra**, Ford Foundation.

The author projected on the screen, the various types of hoist used for erection purpose.

2. Role of Earth Cutting Machinery in Major Development Works by **Sri A. Mazumdar**, General Manager, Tractors India, Ltd.

The author illustrated through film, various earth cutting machinery in working condition, to prove the economic and time saving factors. Mechanisation

has its advantages which the author stressed, though a balance has to be struck with men and machine.

3. Underground Conduit Laying by Driving and Jacking Method by **Sri R. B. Chakraborty**, Engineering Director, CMWSA.

With the launching of development work, underground work will be taken up and various methods of operation need thorough study. The author, explained very lucidly the driving and jacking method which can be adopted with the least surface disturbance, and with economy.

4. City Garbage Problem in Civilised Society by **J. G. Ghosal**, Indigenous Engineering Co. (P) Ltd., Calcutta.

With the advent of the materialistic affluence, in daily life, in relatively thickly populated urban areas wastes pose a problem as it adds to the pollution of nature. Garbage is just one cause for pollution of nature worrying the top technologists, social workers, philosophers and statesman who are already apprehending that in case pollution of nature continue at present rate, it may not be too far that our next generation may have to use gas-masks to be able to breathe non-poisonous air. Garbage problem is thus a part of a colossal problem which threatens the very survival of a healthy human race on earth.

**Sri M. S. Balasundaram**, Chairman of the session and Director-general, Geological Survey of India at the outset thanked the

organisers of the All India Conference on Engineering Materials and Equipment for inviting him—and added to preside over today's session (S-4). I find that the topics for discussion have a vital bearing on the projects relating to Civil Engineering, Mining, Heavy Industries, Reclamation and Urban development. It is hardly necessary for me to emphasize the important use of these equipment in any development programme.

The heavy earth moving and earth cutting equipment of today may aptly be described as the modern 'Dinosaurs'. The advent of these giant machinery had brought out a revolutionary change in our traditional concepts of design and execution in the fields of Civil Engineering and Mining. The following figures present an idea of the colossal quantities of material that had to be handled at some of our River Valley Projects. The construction of the 226 m high Bhakra dam in Punjab involved placement of 4.2 Mcum of earth work and an equal quantity of concrete. At the Ukai Project in Gujarat the earth work alone is of the order 24 Mcum. The 125 m high Nagarjunsagar Dam in Andhra Pradesh required 2.35 Mcum of earth work and 7.33 Mcum of masonry and concrete. The credit for the successful completion of all these projects can rightly be ascribed to the high mechanisation and utilisation, of a variety of heavy machinery like excavators, bulk movers, aerial ropeways, conveyor belts, crushers, batching plants, cranes of all description etc. Tunnelling through soft rocks and squeezing grounds was once considered extremely hazardous. The development and utilisation of

equipment like the 'mole' has not only made this quite safe but also improved the operational efficiency by increasing the rate of progress. Thin concrete diaphragm cut-offs and 'Concrete barriers' are fast replacing the traditional pile driven cut-offs which are laborious, costly and time consuming.

It is during the second world war and its post reconstruction period that the Heavy Engineering Industry experienced a tremendous boost and phenomenal growth all over the world. In the initial periods we had to mostly rely on imports from U.S.A., USSR and other developed countries, causing serious drain on our precious foreign exchange, the Government of India and the Planning Commission had therefore taken urgent steps to create during the first two plan periods a sound infrastructure for the manufacture of the heavy engineering equipment. Thus the heavy engineering and electrical industries were established at Ranchi, Bhopal, Hardwar, Hyderabad, Coimbatore etc. While these developments have immensely contributed to our industrial development and we are today in a position to meet most of our internal demands by indigenous production, it is still a matter for regret that a large percentage of the potential of these industrial units, created with a capital outlay of hundreds of crores, remain under utilised for one reason or the other, thereby rendering imports in crucial sectors of the industry obligatory. This is a situation which should cause grave concern to all those engaged in the engineering industry.

Another aspect I would like to stress is the growing need for the diversification of

the equipment to meet the local conditions. This calls for sustained research in all the branches of the industry. Today science and technology is developing at the tremendous rate. As in the field of high fashions what is considered today to be modern equipment is becoming outmoded tomorrow. Developed countries are spending vast amounts on research and are in active pursuit of invention of new techniques and equipment. If we are not to lag behind we have no other alternative but to invest sizable sums on research. Need-

less to add that this policy pays rich dividends in the long run. While our immediate objective is to achieve self sufficiency, our ultimate aim should be to build up substantial potential for export.

DR. BALARAM BOSE, of Jadavpur University and member of the Council of the Association of Engineers, offered a hearty vote of thanks to all collaborators, delegates and invited guests who contributed to the success of the conference.