Proceedings of

THE SIXTH ALL INDIA CONFERENCE

On

ENGINEERING MATERIALS & EQUIPMENTS

and

WORK EDUCATION

Sponsor : **The Association of Engineers, India,**

24, NETAJI SUBHAS ROAD,

CALCUTTA - 700 001.

Phone No. : 22-6714

Inauguration of the Sixth All India Conference on Engineering Materials and Equipments

at

RABINDRA SADAN

at 10 a m. on 20-11-1975

On Chair : Karmavirottama P. C. Bose

Guest-in-Chief : Sri Ajoy Mukherji,

Former Chief Minister, West Bengal.

Award of Karmavirottama

The Association conferred Karmavirottama on Er. Tinkari Mittra, Prof. H. C. Guha, Er. S. Rajagopalan and Prof A. C. Roy. The citation was received by Sri Mittra, Prof. Guha and Prof. A. C. Roy in person who graced the ocasion by their kind presence; the other recipient Er. S. Rajagopalan could not be present on account of his previous occupation. On request from the chair, Er. Mittra, Prof. Guha & Prof. Roy were kind to address the gathering (given in brief below).

Er. Tinkari Mittra

Doing one's duty faithfully and loyally does not deserve a special award.....The young generation can only be advised to work sincerely whatever might be the agency employing them.

Prof. H. C. Guha

In his Bengali speech he said, "If something glorious is said of the Association, people will interprete that I am reciprocating the gratitude for the Award. Nevertheless, the Association is the *Oldest Professional Association* for *Engineers* in *India* and have been giving service to the Society without so-called *Wild Publicity*.

Prof. A. C. Roy

Although not in favour of reminescing the past, this award compels a look back to my past career. I hope, the Association will bless me so that I can serve my country as in the past upto the last day of my life.

Chief Guest Sri Ajoy Kr. Mukherjee in Brief

In his nicely worded Bengali speech he said, "Though a layman so far as my engineering knowledge goes, I have had the fortune of coming in intimate contact with engineers by virtue of the posts I held in the past. Our problems are ours and unique in nature and the solutions to the same have to be obtained in our own way. I have never been abroad and therefore I do not have specific knowledge about others; but I have very intimately seen my own country, I have seen the sufferings of the general public arising out of scaricities and I am sure, you, the engineers would rise up to the occasion in your own way to better the face of our motherland. About the topics

of the conference I leave them to the specialists for their learned deliberation with a view to formulating the future course of action in the fields.

Excerpt of Chairman's speech

As a lay man using electricity I can say that we are experiencing much difficulties for the last few years. Whatever may be the reasons there have been load sheddings off and on. I am told by many industrialists that they have left West Bengal because of insufficient power available to them. The condition has improved no doubt and I expect your deliberation in the conference regarding Power Generation and Transmission will be useful and fruitful to the people and the country will prosper.

The agricultural problem in India is very acute. This problem will have to be faced as the Chief Guest has made it clear that, for intensive and extensive cultivation adequate water, adequate fertilizer and adequate compost as well as control measure are essential. All these are dependent on us. In the rural areas, power is to be made available. The prices of diesel and petroleum have gone up. So you will have to find out ways and means to provide power to the rural cultivators. A programme has been taken up and this has further to be increased and this is being done.

Another question of great importance for the development in the Metropolitan Area is the traffic and transportation problem. I think, you all will discuss these very problems in your technical Sessions. I wish you all success.

TECHNICAL SESSION

KRISHNAN HALL (G, S. I. Auditorium)

SESSION : S—2 (2 p.m. to 5 p.m) : 20th Nov. 1975

METROPOLITAN TRANSPORT PROBLEM

On Chair : Er R. B. Sen, Engineer-in-Chief & Secretary, P.W D. and Housing Commissioner, W. Bengal.

Keynote Speaker : Er. S. Samaddar, Chief Engineer, P. W. (Roads) Dept., Govt. of W. Bengal.

Papers Presented

1) Underground Storey and its Upward Explosion by Er. Santosh Ghosh.
2) Perspective for Traffic and Transportation Planning for Calcutta by Er. S. Chatterjee.
3) Parking Control in City Centres as a Measure of Increasing Transportation Facilities by Er. S. K. Chanda.

[Written discussion on the papers not received]

Excerpt of Chairman's speech

So far as corridors are concerned here these should have been done much earlier. Diamond Harbour Road is an example. Eastern Metropolitan by-pass should have been done much earlier. My request is that the recommendations should have been specified in your written papers and I feel that those who have participated in this discussion should come forward with specific recommendation as regards short term and long term measures taking into consideration the socio—economic condition as prevalent in the state.

SESSION : S—3 (10 a.m. to 1 p.m.) : 21st Nov. 1975

POWER GENERATION AND TRANSMISSION

On Chair : Er. B. N. Banerjee, Chairman, W. Bengal State Electricity Board.

Key Note Speaker : A. K. Mitra, Dy. Managing Director, C. E. S. C. Ltd.

Papers Presented

1. On the New Developments in Equipment for Harnessing Wind & Tidal Energy by Dr. D. P. Ganguly.
2. Energy Situation and the Role of Energy Resources in Meeting the Power Crisis in India by Prof. S. Biswas.
3. Engineering Materials for Modern Thermal Power Stations by Er. A. Ghatak.
4. Material Problems in the Manufacture of Power Plant Boilers by Er. R. Kumar.
5. Power Transmission System—Its Role, Its Planning and Operation by Er. S. K. Biswas.
6. Nuclear Power by Dr. J. Basu.

Discussors

1) **Mr. Sinha**

While advocating for hydel power I may also point out the failures of different hydel projects. These failures are mainly due to placing wrong persons on the top and then penalising some innocent ones for the mischief so caused—this I can state from my experience as a member of different engineering commission.

2) **Er. Dr. M. Bhattacharyya**

To Mr. Sinha—If wrong persons have been accused and defaulting set of people promoted by commission set up to investigate into the causes of failure of hydel plants, has any time protest been made by man of position against wrongly penalising the innocent people ?

To Er. Dr Ganguly—What mechanism nd equipment are being used for harnessing olar, tidal and wind power in West Bengal ?

[No time could be made available to the uthor for reply]

To Er. R. Kumar—Does the author suggest ny short time measure in view of the present ower crisis apart from phasing of loads ?

Author's reply—No.

To Dr. J. Basu—Cost figures of Nuclear ower are based on what ?

Author's reply—On India Government's urvey Report.

) **Dr. . Datt :**

Claim of Hydel power by Mr. B. N. Sinha s well appreriated.

4. **Mr. K. M. Nayek**

Geothermal project has already been taken up by Geological Survey of India.

5. **Er. S. K. Mukherjl**

Procurement of Nuclear Metals is very difficult in our country.

Excerpt of Key Note speech

There has been forceable dependency today for the quality of standard of living in matters of power and energy of electricity and we are to harness the development as also to make people conscious for alternative better and more efficient means of producing electricity.

SESSION : S—4 (2 p.m. to 5 p.m.) : 21st Nov. 1975
AGRICULTURE

On Chair : Dr. A. N. Bose, Member, State Planning Board, W. Bengal & Executive Vice-Chairman W. B. Comprehensive Area Development Corpn,

Key Note Speaker : Dr. S. B. Chattopadhyay, Vice-Chancellor, Bidhan Chandra Krishi Viswa Vidyalaya, Kalyani.

Papers Presented

1. Irrigation Efficiencies—The Evolution ınd Improvement in W. Bengal by Dr. A. P. Bhattacharyya.

2. Agricultural Mechanisation with Spe-ɔial Reference to Preharvest Operation by Γ. P. Ojha & K. P. Pandey.

3. Design of Pumping Plants for Tubewells by Mr. B. K. Banerjee.

4. Glass Fibre Tubes & Screens by Sri B. Mitra.

5. Prevention of losses through Post-harvest Operations and Equipment by Mr. N. Ali & Dr. T. P. Ojha

6. Clearing of Land for Agricultural Development by Sri H. N. Banerji.

7. Operation Analysis of Agriculture by Prof. B. Dutt.

Written discussion not received.

Excerpt of Key Note speech

Increase in agricultural production visa vis productivity of land is one of the important

tasks that lie ahead of us. Such augmentation of yield per hectare is dependent on the advancement of science and technology in (a) varieties with higher yield potential, (b) agricultural chemicals—fertilizers, pesticides, weedicides, synthetic growth promoters, etc. and c) agricultural engineering—machineries, etc. and the efficient management of the same.

It may be stated that the process of gradual mechanization has not been carefully planned or executed.

Use of machines for the entire agricultural operations has not been aimed at.

...Tractors have not been able to replace country ploughs, but are put into use as additional help for preparatory tillage.

Even though the merits of two wheeled tractors in smaller plots are known, yet the Government has to take steps to familiarise the farmers with the same.

...We have to carry on more work on hand implements.

...Limitations of machineries have often been responsible for limited pest control.

Mechanization of harvesting, thrashing, cleaning has to be introduced to a large extent.

Collection of seeds, drying and cleaning of certain categories often may need mechanization for quality. This aspect has not been touched at all. Our seed industry to a large extent is based on very old out-dated technology.

With increasing cost of inputs and the prospect of payment of water rate on bankable project basis, effective utilization of water has to be achieved in order to reduce the cost of cultivation. Efficiency of irrigation water has to be increased.

In the creation of new technology in the field of agricultural engineering for its ultimate adoption by the users, namely farmers, it has to be borne in mind that the technology has to be cheap and much less sophisticated.

In this context, my submission is that why research and development in engineering as related to agriculture should be restricted only to one I. I. T. and a few agricultural Universities ? Why not these be taken up in other Institutions. Agriculture is still our biggest industry, contributing to more than fifty per-cent of national income and more than seventy percent of our people live in villages and depend on agriculture and even many of our industries are agro-based.

Excerpt of Chairman's Speech

We, social scientists, need the help of technical personnel, the physical scientists etc in order to draw up a plan for the well being of our community. ..... Labour should not be considered as an input but a result .....Modern technology can not be applied piece meal.

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SEMINAR
ON
WORK EDUCATION

KRISHNAN HALL, GEOLOGICAL SURVEY OF INDIA
On 19. 11. 75 at 3 P.M.

Chairman : Prof. H. C. Guha
Former Vice-Chancellor
Jadavpur University.

Key Note Speaker : Dr. P. N. Chatterji, Director,
Technical Education, West Bengal.

The following personalities took part in the deliberation.

Prof. S. M. Chatterji, President, West Bengal Board of Secondary Education

Dr. G. Mukherjee, General Manager, Alloy Steel Plant, Durgapur.

Dr. (Mrs.) L Mitter, Head, Dept. of Management, Indian Institute of Social Welfare and Business Management.

Sri S. Guha, Rector, South Point School, Calcutta.

Mr. A. Martin, Principal, Calcutta Boys' School.

Mrs. I. Ghosh, Principal, Women's Polytechnic.

Dr. K. C. Basu Mallick, Director of Health Services, West Bengal.

Dr. M. Bhattachayya, Reader, Mech. Engg. Jadavpur University.

For reasons beyond control Prof. H. C. Guha could not be present all through when Prof. D. Banerjee, Principal, B. E. College took up the chair.

Excerpts of the talks given by the speakers are given here below.

H. C. Guha

As is well known, there are two broad schools of educational philosophy—one, emphasizing a rigorous and virtually exclusive kind of intellectual exercise, and the other advocating a work-oriented and primarily practical kind of education. The first point of view has been expressed by a long line of powerful thinkers from Plato to Bertrand Russell who have emphasized the need for rigid intellectual discipline and the utmost intellectual progress. But another long line of thinkers from Rousseau to Dewey, Montessori and Mahatma Gandhi, have upheld the second point of view.

As a practical educationist and engineer of life-long experience, I believe that work-oriented education is obviously more relevant

to the developing States with large populations, like India and China, than a purely intellectual exercise Such countries are faced with the urgent problem of mobilizing the manpower and other national resources to the maximum possible extent, and in the shortest possible time, in order to achieve the maximum possible rate of industrialization and economic development. This is the major problem faced by all populous developing countries irrespective of ideologies and political systems. Perhaps that is why there is such a strong resemblance between the educational ideas of Mahatma Gandhi and Mao Tse-Tung both of whom had tried to tackle the massive socio-economic prob'em of manpower and resource mobilization in a practical way, in their respective countries.

Admittedly, and unavoidably, schemes of work-education in this country will remain for some time experimental in character. An ideal system of work-education can be established, through a process of trial and error, only after considerable experience and experimentation.

..... May I add in conclusion that the success of work-education will depend primarily on the seriousness with which it is attempted and the efficiency with which it is implemented ? As a practical engineer and educationist, I feel that organizational and operational efficiency is more necessary for the successful implementation of an educational programme of this nature than definitions and conceptual analyses, and even the preparation of a blueprint. It will require a huge organizational network, a vast cadre of trained and dedicated teachers, considerable finance and official encouragement. Moreover, the occupational structure and employment pattern of our country will have to be altered, so that the manpower output of the schools can become an immediate input of the productive system. Since the work-projects of the schools are expected to be project-generating, long-term steps will also have to be taken for the marketing and distribution of the physical outputs of the schools. All this will require a massive national effort at both official and unofficial levels. Let us all dedicate ourselves to such a national effort, for the hour has struck for a radical change in our traditional educational system, and work-education may be the beginning of such a radicalizing process.

M. Bhattacharyya

The objective of work education seems to have a noble intention. Is intention all ? Will pious wish lead our boys to any palpable goal ? Will the incorporation of work education make our boys more suited to day-to-day living ?

The so-called replies to all these querries, of course, are obviously bright. But it is worth remembering that there is a gulf of difference between the cups and the lips and that history should teach us some lessons specially in the light of what had happened in related fields

One of the objectives of work education is to familiarise the pupils with their environ —the work and the workers, so that they develop a feeling of belongingness to the society, of respect to acts and actors in perpetual action for the smooth running of the society. Alas, can the young minds be attracted to say poultry, pottery, smithy when they witness the wretched condition of the people engaged in the trade ? If the crafts

are dignified, can these craftsmen be so humiliated by the society—the society even is reluctant to provide them with shelter, food and clothing. Well, if there is anything like condition reflex, the young minds in search for a little comfort—an eternal desire in the animal kingdom—will develop a strong apathy for the trades and crafts which apparently invoke material discomfort ! Has this point been given any serious thought ?

.....The syllabii seem to have been put in print as a symbol of some pious wish only. The operative sides have not been given the type of thought they deserve ; rather the syllabii contain the glorified pre-ambles and no specific concrete suggestion. It is strange that the Board has suggested the schools to have the work books designed with the help of experts in order to ensure a correct and comprehensive record-keeping of the work done. Had there been any earnestness on the part of the Board they could have easily hired the services of the experts in the relevant fields and get the needful done for use by the schools.

Ila Ghosh

The main task before us is to have job-oriented plans and to make drastic changes in the educational system which corresponds to the requirement of economy of the country in the present stage of development.

The students who will join Polytechnics from the year 1976 will already be acquainted with work-oriented education unlike the present students. They have been through some kind of manual work on account of the implementation of work education programme at the school level.

Students should be asked to select for their work programme from broad items according to their taste, aptitude and capabilities.

Every individual student or a group of students may be given some project according to their standard and aptitude for work.

Projects may be of following categories :—

(i) Making models.

(ii) Improvising upon existing gadgets, equipments and appliance.

(iii) Complete one particular scheme right from starting, planning upto execution.

(iv) Repairing of appliances, gadgets, machines, structures and also renovation work.

Above all, Polytechnics can be also used for the work education programme of the schools and colleges during its vacation, because all the Polytechnics in the State maintains Carpentry, Smithy, Fitting, Forging, Machine Shop, Welding, Soldering & Foundry sections. The Polytechnics can also become centre of business and industrial firms, Government agencies and other Institutions for upgrading their personnel. This will help the Polytechnic maintain a regular contact with them and through their cooperation only the work-education program can be made a success. With the help of work education we will not only help the students to learn how to do the actual work in hand but also help them to learn dignity of labour. On the otherside it will provide the country to work in human resources development. The objective of this education program will also help to tap unused manpower and experience of the students community.

To fulfil the objectives of the work education program and successful implementation of same, three major alignment has to be done.

(1) Counselling for educational & vocational guidance
(2) Institution-Industry-Partnership
(3) Training of teachers

A. Martin

When a boy or a girl comes to the final class of his or her school, many of them are still undecided as to what profession, calling, trade or occupation they should decide on. There are, of course, many who decide by themselves, or have their future work decided for them, by their parents or families. Our problem lies with the majority of ordinary and extra-ordinary pupils coming from middle class and poor homes—some, among the many, adopt the attitude of Micawber, waiting for something good to turn up. Quite often, this passive attitude does not materialise with anything of any worth, and frustration follows with its many side effects.

Thus the Implementation of Work Education at School Level is a serious necessity of today, much over-looked. The traditional answer is Vocational Education, a system of analysis of the abilities of students, and channelising them to the appropriate profession or trade. This could be helpful if there were plenty of jobs available in the various fields of work.

There is great need for the youth of our land to find an outlet for their vast resource of physical energy and their noble aspirations of adolescence.

For implementation of the courses of a technical nature, like those mentioned above, co-operation is necessary. The firms, companies and factories should have a quota system each year where they agree to take some students who have shown "unusual ability" on recommendation from the school authorities. In this way many students with an elementary technical training can be absorbed directly without undergoing the medium of unnecessary college education.

About those combining social service with work education they would be expected, on a rotating basis, to devote time for the poor children who come in the evening. What they learn in the day as social service they must put to practice in the evening. Those who cannot make themselves available to the school after 5-30 in the evening, because they live far away, should practise their social service in their neighbourhood.

Through this scheme, the young men and women in the senior classes could discover their hidden potential. They could give vent to their physical resources of energy and see fulfilment of their noble aspirations. Besides it would also be a work experienee for them.

This is thus, a combination of work education, and social service at school level. Though the scheme might not offer Work Education at School Level, in a wide variety of subjects, it certainly satisfies the human heart.