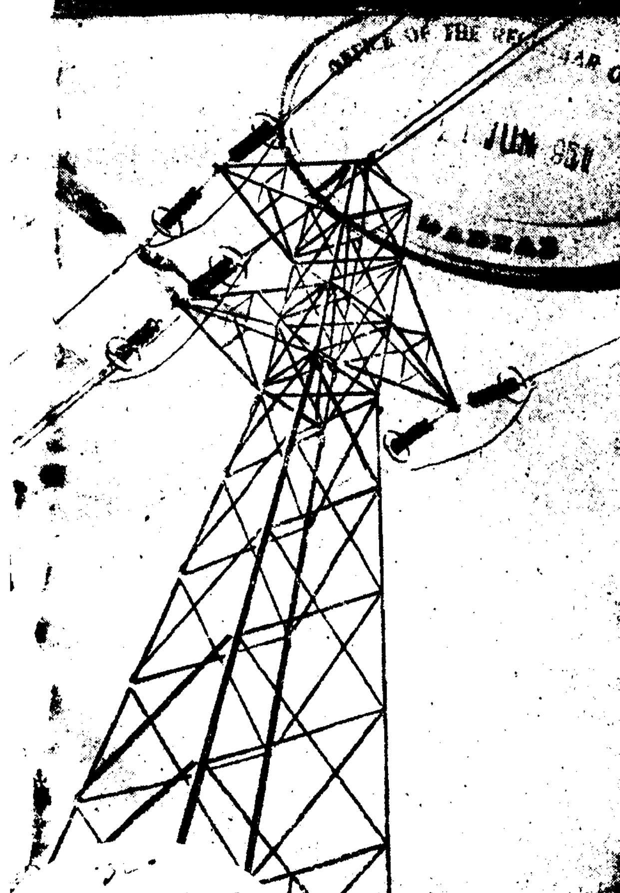
Electrolite

ELECTOLITE

—A Journal of Electricity Supply and Utilization



POWER CONFERENCE

Special Number

ELECTOLITE

(Issued quarterly by the South Madras Electric Supply Corporation, Ltd.,)

TIRUCHIRAPALLI.

Vol. II No. 4 | OCT. - DEC. 1950 | Annl. Subs. Re. 1 Single Copy As. 4

THIS ISSUE

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EVERY ISSUE

Electolite

A Journal of Electricity Supply and Utilization

EDITOR: R. PARTHASARATHY

VOL. II | OCT. — DEC. 1950 | NO. 4

ENGINEERS PROPOSE—

SCIENTIFIC and Engineering Conferences — national or international — have, at least, one saving merit. Discussions are never characterized by any acerbity—the atmosphere is often one of geniality and friendliness.

The Conferences held in New Delhi during January—a brief note about which appears elsewhere in this issue—demonstrated that nations of differing indeologies *could* come together in fields of constructive endeavour. And as the Conferences came off at a time when a third war seemed to be in the offing, they were particularly welcome.

The delegates were there, as Mr. N. V. Gadgil put it, to apply the 'joint pool of world knowledge for the benefit of humanity at large.' And no part of the world, perhaps, stands in greater need of drawing from this joint pool than does India. For notwithstanding her high place in international industrial ranking—she stands as high as number eight—the gap in between is considerable. For this gap to be narrowed down to any appreciable extent, India has to draw not only from the accumulated experience of other countries—she has to draw from their resources, too.

Be it flood control, soil preservation, power production or expansion of irrigational facilities, engineers can only make recommendations—it is only governments who

can implement them. Substantial assistance from those who can render it is required if an underdeveloped country is to translate, in concrete terms, the recommendations of experts.

It is realised that *all* the cultivable land of the country is now not cultivated, and that many drought-sticken areas can be reclaimed by an expansion of irrigation facilities. It is also, realised, that locked up in India's rivers there lies an immense power potential and that only six per cent of it is being harnessed, at present. This terrible waste of a country's natural resources is, in itself, bad, but what is, perhaps, even worse is such waste condemns millions of people to lead frustrated, unhappy and discontented lives. The tragedy is far too deep-rooted for mere 'mealy-mouth'd philanthropy' from industrially advanced countries. Joint international action is, therefore, urgently called for, if our present low living standards are to improve.

National action, too, is necessary. If power is to be properly utilized, we feel, there should be a better appreciation of the role of private enterprise by our own Government than has been in evidence, during recent years.

THE WORLD POWER CONFERENCE

by
SIR HAROLD HARTLEY
(President of the World Power Conference)

THE World Power Conference, which met in New Delhi from January 11 to 15, was founded in 1924 as a step towards achieving the best possible use, nationally and internationally, of the world's resources of fuel and power. It has no individual membership, but is composed of National Committees of countries at the present time numbering forty-three. It was one of the first technical non-governmental organizations to be given consultative status by the Economic and Social Council of the United Nations, and it has the same status with U.N.E.S.C.O.

It owes its existence to one man, the late Mr. D. N. Dunlop, who laid its foundations so wisely that it has weathered the upheavals of the last quarter of a century with its structure unchanged. Mr. Dunlop was born in Scotland in 1868 and had a long and distinguished career in the electrical industry. He was the first organizing secretary of the British Electrical and Allied Manufacturers Association and a founder of the Electrical Research Association. Widely known as he was in the electrical world, it is as founder of the World Power Conference that he is chiefly remembered.

During the 1914–18 war he had seen what could be accomplished by scientists and engineers working together for destruction; and he foresaw the enormous benefits to mankind that would result from the international co-operation of scientists and engineers pooling their knowledge of world resources of energy and power and conferring together as to the best ways of using them.

INITIATION OF THE CONFERENCE

On June 30, 1924, the Prince of Wales opened the First World Power Conference at Wembley, which was attended by delegates from about 40 countries. It was the first private international conference since the 1914–18 war in which both Germany and the Soviet Union took part.

The value of the Conference was so plainly revealed in this first meeting that all the countries represented united to urge that the World Power Conference should be set up as a permanent international organization, which would not only bring together producers and consumers of power and fuel but would provide a meeting place where scientists and

engineers could thrash out with economists and administrators the problems, the importance of which to world development were yearly increasing. The opportunities for personal contact provided by the Conference were of no less value than the technical advances resulting from the meetings.

FAMILY PARTY

From 1924 until his death in 1935, Mr. Dunlop, as Chairman of the International Executive Council and of the British National Committee, was the driving force of the Conference. There was no side of its activities in which he did not take a leading part, but perhaps there were two aspects in which his influence has proved to be particularly important. The first was the result of his own personality; his friendliness, tact and humour welded the members of the International Executive Council, which met yearly, into a band of friends from all parts of the world who looked forward eagerly to their meetings. As a former Vice-Chairman of the Council said, 'The little group of regular attenders became in the course of years an international family party with a real unity of purpose which no external events could disturb.' That is true of the International Executive Council today.

The second was in the drawing up of the constitution. This was done with such foresight and commonsense that in the course of twenty-five years no major change has been necessary; and one has only to look at the list of member-countries to realize what an achivement that was.

Participation by different countries in the First World Power Conference was organized by *ad hoc* committees, but Mr. Dunlop's faith in the future of the Conference was shown by his insistence that its title should be the First World Power Conference.

These *ad hoc* committees formed the nucleus of the permanent national committees, while the original International Executive Committee became the permanent International Executive Council.

While the Central Office has remained in London, the International Executive Council has met yearly except during the war in different countries, and at these meetings, has arranged the Plenary and Sectional meetings which have been the outstanding events in its history.

The International Executive Council (I.E.C.) is composed of delegates from each National Committee which normally includes representatives of Government departments, of learned and technical societies and institutions, of public utilities,of manufacturers' associations, and of other interests concerned with the production or the use of fuel and power.

Its present chairman is Sir Vincent de Ferranti, who succeeded me in this office last July, when I had the honour of being designated President.

It is this Council which decides the venue and dates of Conferences and approves the broad outline of the technical programme submitted by the host country. Since 1945 the I.E.C. has met in London, Paris, Stockholm and Brussels.

The plenary meetings are normally held at intervals of six years. Following the first London Conference of 1924, the second Plenary Meeting was held in Berlin in 1930 and the third in Washington in 1936. The war interrupted the succession, and the fourth plenary meeting of the World Power Conference was held in London, its birthplace, in July of last year.

The first plenary meeting in London was attended by rather more than a thousand delegates. Its programme centred round the problems of estimating the world resources of fuel and power and using those resources to the best advantage.

The second World Power Conference, held in Berlin, dealt with power problems from every angle. The Third Conference met in Washington, D. C., in 1936 by the invitation of the Government of the U.S.A. and one of the sessions was addressed by President Roosevelt. The subject of the meeting was "National Power Economy" and fifty-four countries were represented.

The theme of the Fourth World Power Conference, of which Their Royal Highnesses Princess Elizabeth and the Duke of Edinburgh were patrons, was " World Energy Resources and the Production of Power," and once again it brought together the leading fuel and power experts from more than fifty countries. One of their main tasks was to review the energy resources of the world and to estimate the rate on which they are being drawn by the ever-rising demands of to-day. There were discussions on the best use of all forms of fuel, and on all the latest developments in power production, from gas turbines to the utilization of temperature differences between surface and deep sea-water. The session on the problems involved in the use of atomic energy for industrial purposes, which included contributions from the Soviet, American, British, French and Canadian delegations, aroused especial interest.

The Indian delegation numbered seven, and was led by Mr. Khosla, Chairman of the Central Water Power and Irrigation and Navigation Commission, and of the Indian National Committee of the World Power Conference.

SECTIONAL MEETINGS

The sectional meetings, of which the present conference in New Delhi is one, were designed to discuss limited aspects of the general programme of the Conference. Up to 1939, the following meetings were held, with an average attendance of about 1,000 :

Basle sectional meeting, 1926 : Water power development and inland navigation.

Fuel Conference, London, 1928 : The economics of the fuel industries; the preparation and utilization of fuels.

Barcelona sectional meeting, 1928 : The utilization and economy of water resources.

Tokyo sectional meeting, 1929 : National and international developments of

power resources; rational unification and economical administration of electrical power development; power for use in transport; better efficiency in power production.

Scandinavian sectional meeting, 1933: The power problems of large scale industry and land and sea transport.

Chemical Engineering Congress, London, 1936: The first International Conference on chemical engineering.

Vienna sectional meeting, 1938: The supply of energy for agriculture, small-scale industries, household purposes, public lighting and railways.

The first post-war sectional meeting was held at The Hague in September 1947. The subject was fuel economy, of which many of the members had had recent and first-hand experience.

PROCEDURE AT MEETING

The general plan of both Plenary and Sectional meetings is the same. The meetings are organized by the host National Committee in co-operation with the Central Office in London. The papers are not read at the meetings, but are circulated in full in advance as preprints, collected in sections and summarized in a general report, which also suggests topics for discussion. This procedure has proved to be most valuable, enabling the whole of the sessions to be spent in discussion, discussion which is the more effective since it is based on previous consideration of the papers. The conference has no official languages, the host National Committee deciding on the languages to be used. Before the war English, French and German were usually chosen, but Spanish was added at the Washington Conference.

The papers and discussions and the general reports are published subsequently in the transactions of each meeting. Sixty-eight volumes have appeared between 1924 and 1947, and they are a unique source of information on almost every aspect of the utilization of energy in all parts of the world.

PUBLICATIONS

The other main publication of the Conference, supplementing its transactions is its *Statistical Year Book*. After ten years of preparatory work, including the publication of a book entitled *Power Resources of the World: Potential and Developed*, the Central Office began in 1936 the publication of the *Statistical Year Book* of the World Power Conference. This was a compilation of national statistics of energy resources and their utilization on a comprehensive and comparable basis. Nothing on this scale had been attempted before, and it was a heavy task only made possible through the yearly compilation of the statistics for each country by its National Committee with the assistance of Government departments and other organizations. Anyone who has worked with international statistics will realize what a tremendous task faced the editor, Mr. Frederick Brown, and must applaud the courage and practical thoroughness with which he

produced the volume, remarkably free from ambiguities and mistakes. The first volume covered the years 1933 and 1934, and further volumes were published in 1937 and 1938.

The war interrupted the series, and it was not until 1947 that the fourth number appeared. Except for a very few neutral countries, the upheavals of war and the urgency of other post-war problems made the task of collecting comparable statistics covering the years 1936 to 1946 one of great difficulty, and both the National Committees and the editor had reason to be proud of the result. *Statistical Year Book No. 5* was published in September 1950. It contains annual statistics for 1946-1948. The welcome given to the series by the technical and economic journals shows that it fills a real need, and it should become increasingly valuable as the estimates for the less documented countries become gradually more accurate.

The World Power Conference has always been interested in questions of standardization, and in 1936 the Central Office published *A Survey of the Present Organization of Standardization—National and international* which was the first authoritative compilation of facts regarding the national organization of standardization in thirty-two countries. Although it made no recommendations, this survey of the widely differing methods in use emphasized the importance of a greater measure of agreement in this field and speeded up reforms.

Many of the National Committees are themselves responsible for publications in their own countries. The standard work entitled *Technical Data on Fuel* produced by the British National Committee is an example.

AFFILIATIONS

The conference has a daughter organization, the international Commission on Large Dams of the World Power Conference, created in 1929 on the initiative of the French Government. The National Committees of the Commission are normally constituted as Sub-committees of the National Committees of the Conference, and the first Congress on Large Dams was held in Sweden in 1933 concurrently with the Scandinavian sectional meeting and the second in Washington in 1936 concurrently with the third World Power Conference. The third Congress was held in Sweden in 1948 and was an exception in that it was not held in conjunction with a meeting of the parent organization. The fourth Congress took place last month at New Delhi concurrently with the sectional meeting of the World Power Conference.

The conference colloborates also with other international bodies, carrying out the spirit of the declaration made at the first plenary meeting that it would not interfere or overlap with the functions of any existing organizations. Such bodies as the Conference Internationale des Grands Reseaux Electriques, (C.I.G.R.E.) Union Internationale des Producteurs et Distributeurs d'Energie Electrique, and

the International Gas Union, are in constant touch with the Central Office, exchange official delegates to their respective meetings and co-operate in the collection of statistics.

During the war years the work of the Conference was in abeyance, but when the first post-war meeting of the International Executive Council was held in London in November 1945 there was an enthusiastic reunion of old friends, and plans for the future were eagerly discussed. Since that time new National Committees have been set up in Egypt, Iceland, Israel, Pakistan and Turkey.

THE NEW DELHI MEETING

The sectional meeting of the conference was held in New Delhi last month at the invitation of the Indian National Committee. The meeting devoted to discussions in two fields which are of special importance to India and other Eastern countries: (a) the use of electricity in agriculture, (b) the co-ordination of the development of industries and the development of power resources.

The papers of the Vienna meeting in 1938 were of special significance for the less industrialized countries, and the meeting at New Delhi, by bringing together engineers and scientists from the East and West, is following the best traditions of the conference. It should help materially towards the successful solution of the urgent power problems which are facing the countries of Southern Asia and the Middle East.

SOME ASPECTS OF ELECTRICITY UTILIZATION IN THE FERTILIZER INDUSTRY*

by

V. SESHASAYEE, *Comp. I. E. E.*

THE fertilizer industry is one of the most important chemical industries of the world today. The world production of fertilizers for 1948 is of the order of 3·4 million tons of nitrogen, 5·4 million tons of P_2O_5 and 3·5 million tons of K_2O in various forms. For the production of these quantities of nitrogen and phosphoric acid, power requirements may roughly be computed at about 1·5 million kW. (12,000 million kWh.) This is an indication of the vast quantity of electricity required by the fertilizer industry.

NEED FOR FERTILIZER PRODUCTION

The area of food crops under cultivation in the Indian Union is 170 million acres. The yield per acre in India is far below that of other countries of the world. In order to make the country self-sufficient in its food requirements and enable it also to meet the needs of its growing population, it is necessary that the overall yield of the country be increased. One sure and quick method of doing this would be to resort to intensive cultivation using artificial manures. Any increase in food production must, of necessity, mean an increase in the production of chemical fertilizers.

Of the various kinds of fertilizers, the most important ones probably are nitrogen, phosphorus and potassium in forms assimilable by plants. The fertilizer requirements of the country have been estimated to be nearly two million tons of nitrogen and one million ton of P_2O_5. For these alone, the energy requirements would be over 5,000 million kWh (nearly 1 million kW). Potash is generally mined or collected from natural sources.

Against these estimated needs, the present installed capacities of the fertilizer plants in the country are as follows :—

	Nitrogen (Tons)	Ammonium Sulphate (Tons)
Mysore ..	1,200	6,000
Travancore ..	10,000	50,000
Sindhri (1950)..	70,000	350,000
Coke oven gas..	4,000	20,000
Total ..	85,000	426,000

* Being a paper presented to the Sectional Meeting of the World Power Conference, held in New Delhi, during January.

There are about 14 superphosphate plants in India with a total installed capacity of 150,000 tons. (25,000 tons of P_2O_5). It will thus be seen that only about 3 per cent of the estimated requirements could be met by the present installations. The scope is, therefore, immense for the further expansion of fertilizer production in India.

Link with Power Development

Closely linked with the production of fertilizers is the question of power availability and power development. It is hardly necessary to state here that the most important step in fertilizer production is nitrogen fixation.

For the fixation of nitrogen, the following three processes have been developed :—

1. Arc process.
2. Cyanamide process.
3. Direct synthetic ammonia process.

On account of the high requirements of power for the arc process, it has now become obsolete. Although about 450,000 tons of nitrogen are fixed annually by the cyanamide process, this is also becoming obsolete and, in all likelihood, new plants based on this process will not be installed. As carbide and its product acetylene are needed for various industrial processes, a fruitful field awaits here for further exploration.

By far the most important process for the fixation of nitrogen is the ammonia synthesis or Haber Bosch process.

Ammonia is synthesized from hydrogen and atmospheric nitrogen which are brought together, after purification, into a catalyst chamber at about 5,000 p. s. i. pressure. The principal cost of ammonia, apart from actual manufacturing cost, is the cost of hydrogen. When the energy requirements of ammonia manufacture are considered, a significant fact emerges, namely, that it can vary from 2,000 kWh to 16,000 kWh per ton of fixed nitrogen, depending upon the hydrogen process used.

In countries where good coke is available and power is at a premium, the water gas process is largely used. With coke it is possible to produce the correct proportion of nitrogen and hydrogen for ammonia synthesis. There are also examples of hydrogen preparation from firewood, lignite and other low quality fuels, using the steam iron and other processes. Energy requirements for the manufacture of ammonia by all these methods are roughly 2,000 kWh per ton of fixed nitrogen.

Hydrogen can also be manufactured by the electrolytic process. This process is feasible only in places where large blocks of electric power are available at low cost. In this process, high purity hydrogen is obtained, reducing thereby the purification finally necessary for the synthesis gases. This process is in wide use in Scandinavian countries, and recently one such factory was set up in spain. Of the two ammonia plants in India at present, the smaller one in Mysore works on this process. The

energy requirements for ammonia manufacture by this process are about 16,000 kWh per ton of nitrogen fixed.

This wide variation in energy requirements—of between 2,000 kWh and 16,000 kWh per ton of nitrogen—for the same end product by different processes, is a significant factor in the selection of any process for the manufacture of ammonia. With the development of the hydro-electric sources of the country as at present programmed, it may well be that we may choose the electro-chemical method of ammonia manufacture as a development load on our power systems. Apart from providing products of vital national importance, it will serve to conserve our resources of coking coal. Another outstanding advantage of this process is that as air, water and electricity are the only chief factors that are required, the plant for the manufacture of ammonia can be located close to hydel generating stations.

Notwithstanding the high capital cost involved, hydrogen manufacture by the electrolytic process cannot be ruled out, particularly in locations where there will be a surplus of power. In the East Punjab, for example, where over 300,000 kW will be generated when the Bhakra project goes into full operation, this process can profitably be adopted. As along with the project, irrigation facilities will also develop, the feasibility of setting up a fertilizer plant in the region looks attractive. For a 100-ton-a-day ammonia plant with electrolytic hydrogen, power of the order of 50,000 kW will be required. With a fair power cost, the price of the fertilizer around the factory up to about a 200-mile-radius will be competitive. A 100-ton-a-day ammonia plant is less than 2 per cent of our country's needs of ammonia.

It will thus be seen that the production of ammonia fertilizer can be a big and useful field for the utilization of large blocks of electric power.

Electricity Utilization in the Manufacture of Ammonia Compounds for use as Fertilizers

Experiments have been successfully carried out in America and some other countries for utilizing ammonia directly as plant food by injecting it into the soil under favourable conditions. The popular form of application of ammoina as fertilizer still largely in use is, however, as ammonium sulphate, ammonium nitrate, ammonium chloride or other compound fertilizers like ammonium phosphate and fertilizer mixtures containing ammonia or nitrogen.

Ammonium nitrate is a concentrated fertilizer containing 35 per cent nitrogen. It is explosive as also very hygroscopic. It is, therefore, usually diluted with chalk and marketed as cal-ammonium nitrate containing about 15 per cent nitrogen. Except for the provision of the required quantity of chalk, the manufacture of ammonium nitrate does not need any raw material other than air, water and electricity and process steam. Ammonia is oxidised into NO_2 absorbed in water and the resulting nitric acid is mixed in

suitable proportion with ammonia to form ammonium nitrate and the resulting compound is diluted with chalk and marketed as cal-ammonium nitrate. Both nitric acid and ammonium nitrate are very useful not only as fertilizers but also in the manufacture of explosives and other war and peace-time material. Ammonium sulphate is formed by reacting ammonia either with sulphuric acid or with gypsum. Ammonium sulphate contains about 21 per cent nitrogen, is less hygroscopic and is very popular. But its manufacture requires either gypsum or sulphuric acid. The energy requirements for ammonium nitrate, ammonium chloride or ammonium sulphate will be of the order of about 1,000 kWh per ton of ammonia. This is in addition to the energy requirements for ammonia as such.

The Government of India's Sindhri fertilizer factory, which will have a capacity of 1,000 tons of ammonium sulphate per day, will have a connected load of about 45,000 kW. The proposal there is to generate all power requirements by the installation of steam turbo-alternators. Part of the turbine capacity will be of the extraction type for the supply of process steam. The considerations which have weighed with the Government in the installation of these turbines are presumably the need for steam for process work, the low overheads consequent on the generating station being an integral part of a large organisation, and the importance of supplementing the hydro-electric supplies of the Damodar Valley Scheme. At Sindhri, hydrogen will be generated on the water gas process using coke. Ammonia is made into ammonium sulphate with the use of gypsum. In the fertilizer factory of the Fertilizers and Chemicals, Travancore, Limited, Alwaye, (Travancore-Cochine State), hydrogen is produced by the steam iron process, and wood from the Travancore forests is used for the production of the necessary preliminary gases. The Alwaye factory has a capacity of 150 tons of ammonium sulphate per day, and it is designed normally for operation at 50 per cent with sulphuric acid and 50 per cent with gypsum. The requirements of energy at the Alwaye factory are of the order of 500 to 600 kWh per ton of ammonium sulphate (including ammonia).

Urea—a compound of ammonia and carbon dioxide—is also used as a fertilizer. Besides ammonia, carbon dioxide is required for its manufacture. Urea contains 46·6 per cent of nitrogen.

Since 1924, Badische Anilin Und Soda Fabrik (I. G.) have brought urea in the market as a fertilizer. The first commercial manufacture of urea in the U. S. began in 1935, in the Du Pont ammonia department. To-day enormous tonnages are used for the production of fertilizers, plastics, adhesives, etc. Urea and urea compounds are sold for fertilizer purposes in the U. S. and Germany under such names as Floranid, Ureor, Calciureor and Uramon. The establishment of this industry will be an incentive to the growth of the plastics industry in India.

Another interesting development when we consider the conversion of ammonia into its salts for fertilizer use is the manufacture of ammonium chloride. Ammonium chloride as a fertilizer is quite comparable with ammonium sulphate and is common in Germany and on the Continent. Ammonium chloride is mixed with 65 per cent of its weight of $CaCO_3$ and sold as lime-ammonium chloride, This gives about 16 per cent of nitrogen. The development of ammonium chloride is closely interlinked with that of caustic soda. The annual requirement of caustic soda in India is estimated to be over 100,000 tons. Not even 10 per cent of this is produced in our country at present. Besides electric power, the only raw material needed is common salt which we have in abundance in India.

About 4,500 kWh of electricity will be necessary for every ton of caustic soda produced by the electrolysis process. The chief difficulty at present is the disposal of the chlorine. If chlorine can be absorbed as ammonium chloride, the development of the caustic soda industry along with the ammonia industry will be possible. A production of 50,000 tons of caustic soda would mean only a production of 70,000 tons of ammonium chloride. But assuming electricity is fully utilized—including the electrolysis of water for the production of hydrogen—a plant for the manufacture of 25,000 tons of ammonia and 50,000 tons of caustic soda will itself consume about 600 million units (kWh) per annum. The utilization of electricity for such purposes will form a useful load when large-scale hydel power schemes are developed. This will mean the utilization of about 75,000 kW of power.

Power Requirements for Superphosphate

Superphosphate is the most important source of phosphorus in plant food. The power requirements for superphosphate manufacture may be computed thus :—

An economical unit of production will be 100 tons per day of superphosphate with a 50-ton-a-day sulphuric acid plant. The power requirements of the sulphuric acid plant will be 60 kWh per ton. For superphosphate, the power requirement is 50 kWh per ton of 17 to 18 per cent P_2O_5 (water soluble) when standard equipments are used. It may, therefore, be taken that for a ton of P_2O_5 manufacture about 450 kWh of energy will be needed.

We are importing at present our requirements of rock phosphate from countries like Greese, Morocco, Egypt, etc., but when power is available in plenty, the manufacture of elemental phosphorus and phosphoric acid from even the low grade phosphates available in our country will be possible. The energy requirements for this will be about 4,000 kWh per ton of 85 per cent phosphoric acid. Just as it is being done in TVA, calcium meta-phosphate and other sintered phosphates can also be manufactured.

As has been stated already, the importance of increasing fertilizer production in the country, as the logical corollary of

which will follow, increased food production cannot be overestimated. In order to fulfil the tremendous need of fertilizers in India we have to think in terms of establishing several plants for the production of various types of modern fertilizers. For this, an abundant supply of electric power at economic rates is most desirable.

When all the hydro-electric projects which are at present being pursued with vigour by the various administrations in India are completed—it is said that there will be about 15 million kW of power at the disposal of the country. The creation of these large blocks of power presents a number of problems as to their proper utilization. These have to be tackled after careful planning with regard to the particular problem of India. A well-planned installation of fertilizer factories, besides serving the nation's need of plant food, will also act as a cushion-load and help in the development of the hydel sources of our country.

UNDER TWO MASTERS

E *lectricity is our best servant*	*who,*
L *ends his wonderful support*	*to*
E *ach and every one of us—to you and to me.*	*He*
C *ares so much for us—none more so.*	*He*
T *akes all the necessary pains for our gains!*	*Yes,*
O *f course! He takes his job in his stride—*	*just*
L *ike a giant in seven-league boots!*	*So,*
I *t will pay us*	*to*
T *ake him on as our servant, right now, keep him*	*in*
E *mployment and—pray Mettur* won't conspire to fire*	*him!*

—M. R. Dorairaj,
Operator, Karaikudi Office.

* To those who may not know : This area is largely dependent for its power supply on the Mettur Hydro-electric System.

A BRIEF NOTE ON THE SECTIONAL MEETING
Of the world Power conference, New Delhi

ABOUT 800 engineers from 34 countries attended the joint session of the World Power Conference (Sectional Meeting), the International Commission on Large Dams and the International Commission on Irrigation and Canals, held at New Delhi from January 11 to January 16.

Inaugurating the session, Mr. C. Rajagopalachari, Home Minister, said that the world most needed men who could discover and those who could help conserve a nation's natural resources of materials ; it needed men who could create the means for utilising all their resources for the use and convenience of society at minimum cost and with minimum waste and maximum results.

Sir Vincent de Ferranti, (United Kingdom) Chairman of the International Executive Council for the World Power Conference, stated that India was about the most fitting country for holding the conferences. He also referred to the paramount need for harnessing power resources for the benefit of mankind.

Amongst others who spoke on the occasion were : M. Andre Coyne (France), Mr. S. A. Beggemann (Netherlands), Mr. Gail A. Hathaway (U. S. A.), and Mr. A. N. Vozvsenky (U. S. S. R.).

In a message to the Conference, President Dr. Rajendra Prasad said that the meetings provided " the best opportunity of collecting the findings and pooling the experience of all participating countries for the greater benefit of humanity ".

The subjects covered at the Delhi Conference were the following :

January 12 :

Co-ordination of the development of industries and the development of power resources.

(1) Power Load Planning.
(2) Modern Equipment, Methods and Research in Power Utilization.

January 13 :

Utilization of Electricity in Agriculture.

(1) Electricity and the farm,
(2) Electricity and the home.
(3) Electricity and processing of agricultural products.
(4) Electricity and Irrigation.
(5) Electricity and Fertilizers.

Jannary 15 & 16 :

Co-ordination of the development of Industries and the development of Power Resources.

(1) Railways.
(2) Other transport.
(3) Power and Traction.

Side-lights on the World Power Conference

by

H. K. RAMASWAMI

DELHI was the scene of great activity from January 9, when delegates from all over India started arriving for the four International Conferences and for the International Engineering Exhibition, to be held for the first time, in India.

Delegates from the Madras State, including private individuals and those from Government should have been over forty. The Constitution House accommodated quite a large number of the delegates —nearly 400. Others, particularly foreign delegates stayed at Delhi's more important hotels, like the *Imperial*, *Maidens* and *Swiss*.

The Constitution House presented a really international atmosphere. Those from Madras, not used to the January cold of Delhi, had to make the best of their "make-do" warm clothes, and looked quite picturesque in their borrowed military great coats and multi-coloured scarves, sitting huddled near the fires.

On the morning of January 10, took place the registration of the delegates. The C. W. I. N. C. and the Board of Irrigation who were in charge of the arrangements had opened temporary offices at Parliament House. Papers and literature, identity badges, invitations to functions, etc., were supposed to be received from this office. For the benefit of the delegates, a temporary post office had also been put up.

But the confusion that prevailed that morning, was truly magnificient; it was more like buying tickets for the first night show of a widely advertised picture in one of our bigger cities—where all attempts at organising orderliness are stoutly opposed and successfully resisted !

PLANNED CONFUSION !

Those who went in early—by 9 o'clock —were able to gate-crash and get their papers and badges. Late goers—like myself—had to come away disappointed.

At the counters where our papers were supposed to be available there were only empty pigeon-holes. We then trooped into the Secretary's room. That poor official was being harassed by half-a-dozen Indian delegates simultaneously ! And the foreign delegates, too, were not being precisely complimentary! In fact, I had to borrow all my papers, etc., from Mr. V. Seshasayee and even he despite being a Vice-President, could not get all his papers any too easily! I have it,

however, on the authority of a friend that at all conventions, in America and England, a certain amount of confusion is deliberately created, so as to bring the delegates really together and to create a free and easy atmosphere.

THE EXHIBITION

On the afternoon of Jan. 10, the Exhibition was inaugurated by the Hon'ble Mr. V. N. Gadgil, Minister for Works, Mines and Power. The function was held at a large *shamiana* erected outside the exhibition grounds and a very distinguished gathering, consisting of officials, non-officials and foriegn diplomats was present. Here, again, there was evidence of lack of attention. The front rows were all occupied by the early "birds," and several distinguished persons who came afterwards had to discover places for themselves, as best as they could.

After an introductory speech by Mr. A. N. Khosla, and the formal inanguration of the Exhibition by Mr. N. V. Gadgil, speeches were made by the representatives the U.S.A., the U.K., France, Russia and other countries. Perhaps, the most impressive speech was that of the U.S. delegate who exhorted Engineers to take to their nation-building activities with enthusiasm, earnestness and speed as "half the world goes to bed every night hungry and 50,000 new mouths are awake every morning demanding breakfast".

Delegates from France, offered all help to India for their development.

I could make only a very rapid tour of the various exhibition stalls which were all then in various stages of completion. Apparently, not having handled such a a huge job before, those in charge were caught napping. Even water and electricity services had not yet been organised on the opening day; several exhibits would appear to have been miscarried or wrongly delivered. Roads were being made, carpenters and electricians were still busy on empty stalls on January 10. Only the relief map and the entrance to the exhibition were ready–and a few stalls like those of the Madras Government (easily the best from this country) and those of U. S. A., U. K. and France.

The stalls of Almunium Industries and and FACT, our sister concerns, were ready only towards the end of the conferences, the delay being mainly due to the non-availability of electricity.

But the exhibition itself, inspite of these shortcomings, was unique. Live models and scale models of most of the famous engineering works of the world, charts, posters and photographs, and a comprehensive range of electrical and agricultural machinery were displayed. A detailed study of these would vastly repay any engineer – such an opportunity is rarely had. Another feature of this exhibition was that the stalls were all in charge of experts who were most willing to discuss their projects or products—and who could meet visitors at high technical levels.

It is gratifying to learn that the exhibition has been extended by another month. It is also to be hoped that though such an

exhibition as this cost a lot of money, more such exhibitions will be held in all important towns and cities—and all through the year, so as to give Engineers an opportunity to study the latest developments. Such exhibitions are an effective substitute for foreign studies—which not many can afford.

To go back to the proceedings: the day's proceedings ended with a tea given by Mr. N. V. Gadgil for all the delegates. As was to be expected this was really a grand function, and very well-attended.

The official opening of the conferences was at a plenary session held in the Houses of Parliament on Jan. 11. The conferences were opened formally by the Hon'ble Mr. C. Rajagopalachari. He was at his humorous best and his simple and sincere speech held all spell-bound—the foreign delegates and the diplomats who occupied the main hall as well as the Indian delegates who were relegated to "pigeon holes" in the visitors' gallery as C. R. himself described. If only Engineers could stand up to Mr. C. Rajagopalachari's specifications ...

The evening was taken up by the Delhi Centre of the Institution of Engineers (India) who acted as hosts to the delegates at a tea at the Red Fort. The delegates enjoyed themselves visiting this historic place; and many cameras were busy clicking. The foreign delegates appeared greatly impressedwith the architecture and beauty of the buildings, the layout of the beautiful terrace gardens and the palatial marble hall.

MR. C. RAJAGOPALACHARI delivering the inaugural speech.

Later that evening, we were all invited to a cocktail party at the Gymkhana Club, the host being Mr. Nanda, Managing Director of Escorts (Agents) Ltd., Delhi, a well-known firm of manufacturers' representatives, dealing in heavy engineering machinery and equipment. The cocktail party was very well attended, and was quite a successful affair.

BUSINESS PROPER

The next day turned out to be the really busy day of the conferences. The World Power Conference had its sessions at the Council House of the Parliament Buildings, while the Conference on Large Dams and Irrigation its—at the Parliament House proper.

For the convenience of the delegates, there were interpreters and translators for translating the speeches of the delegates both into English and French.

The proceedings of the four succeeding days of the World Power Conference were according to the following time table :—

Wednesday, Jan. 10 :

Opening of the Indian International Engineering Exhibition by the Hon'ble Mr. N. V. Gadgil.

Thursday, Jan. 11 :

Joint Inaugural session.

Friday, Jan. 12 :

World Power Conference (Sectional Meeting).

Co-ordination of the development of Industries and the Development of Power Resources.

Saturday, Jan. 13 :

Utilization of Electricity in Agriculture.

Monday, Jan. 15 :

Co-ordination of the development of Industries and the Development of Power Resources.

Tuesday, Jan. 16 :

Same subject.

All the meetings were very well attended both by the Indian and foreign delegates. The keenest interest was evinced in the discussions. The procedure at each session was that after a brief introductory speech by the Chairman covering the subject of discussion, the General Reporter of the day made a survey of the papers presented for discussion and suggested the points arising out of such papers on which discussion could usefully centre; as delegates who wished to speak would have sent in their names earlier to the Chairman, they were called up by him when the meeting was in session. Their names and the names of the countries that they represented were written prominently on a board for the information of all the delegates. For the benefit of the delegates who did not know English, a French translation was provided; similarly where a delegate spoke in French, an English translation was given. The two recognised languages for the Conference were English and French. The only exception was in the case of the delegates from the U. S. S. R. who were allowed to speak in Russian and their speeches were translated both into English and

The day's session ended by the General Reporter's summary of the discussions; the Chairman's *resumè* and comments; distribution of papers for the next day's discussions and announcements by the Vice-Chairmen of any alterations in programmes or any special arrangements made for the delegates.

As I said before, everyone of the meetings was well attended and the keenest interest was evinced by all the delegates. Quite a good number participated in the discussions.

As detailed reports are shortly to be published I shall content myself here with a few random observations :—

(*a*) The problems of Asiatic countries are vastly different from those of European and American countries in so far as utilization in agriculture is concerned. For instance, we could hardly appreciate the use of electricity in soil heating, soil sterlization, artificial lighting either for accelerating plant growth or for chicken farm, etc. These are some of the major needs of a continent where Nature has not been too kind in respect of warmth and where sunlight is in "short supply". Our problem on the other hand is only to find plenty of water and an easy means of lifting it. Discussions on these aspects naturally interested only one section of the audience.

(*b*) The use of single-phase motors up to 50 H. P. as a means of developing rural loads seems to be gaining prominence on the Continent. The advantage, of course, is the savings in costs and more in materials, for building up the necessary High Tension and Low Tension net-works. Consumer equipment is often an item of heavy cost and, in our country particularly, where we do not have any manufacturing capacity for anything other than straight poly-phase squirrel cage motors, the problem of getting foreign currency for buying consumer equipment can be very serious. This is a problem that merits consideration, in national interests.

(*c*) The Russian delegates gave a glowing description of developments in their country, particularly the remarkable development that had taken place in rural electrification, over a five-year-plan which was initiated after the country became a Socialistic Republic.

What impressed me most was their mass produced electric tractors run off overhead power mains, particularly for ploughing, cultivating and harvesting large farms. These tractors which, in their mechanical details, are said to resemble those of the usual diesel-powered tractors, have an electric motor for motive power with a trailer cable on a universal paying-out winder drum. Power is derived from small portable substations which are carried on trailers and are connected to live 11 kV. net-works. The ploughing range of a tractor is said to be a radial distance of 2000 ft. about a substation, which makes the proposition attractive. Much interest was displayed by the Indian delegates in this development, particularly as this

would be a good load for an electricity undertaking, and would also be the means of improving agriculture, at reduced costs.

(*d*) Discussion also centred on the use of cheap wood poles as against concrete poles and the use of aluminium for copper to reduce costs of rural distribution. (This type of conductors is said to be most prevalent in Canada). Every country seems to be faced with the same problems of want of materials and rising costs. In this connection, the paper presented by the Madras State which describes in detail their rural distribution schemes was in great demand by all Engineers. Madras is easily the pioneer State in rural distribution, and it stands perhaps foremost in India, in its achievement. Unusual interest was displayed by the Indian delegates in A. C. S. R. and All-Aluminium conductors and my friend Mr. V. G. G. Nayar had a busy time furnishing data and details to all Engineers who showed interest in this material. I think they are all looking up to him now to solve their "conductor" problem !

(*e*) In the discussion on Electricity and Fertilisers, attention was focused on the factory at Alwaye for the reason that it is at present the biggest plant in India, producing about 50,000 tons of ammonium sulphate and about an equal quantity of superphosphate, using mostly the indigenous fuel of the Travancore forests and the gypsum of Trichinopoly, as raw materials. Additional interest was lent by the fact that Mr. V. Seshasayee, the Managing Director of the managing agency firm of this company—who planned the whole project—was a Vice-President of the session. The Travancore project is novel and unique in that direct wood gasification has been used for the first time for ammonia synthesis.

On all the four days of the Conference the delegates were entertained lavishly, and I am sure they would have left with good impressions of our hospitality.

On the evening of Jan. 12, the National Committees arranged for a grand banquet at the Imperial Hotel. Covers were laid for over 800 persons. The menu given below should give one some idea of the food served. (I give only the vegetarian part.)

Kashmiri Tomatoes soup, Cheese cutlets, Lady Finger fried, Black Mushroom and Peas, Potatoes Banarsi, Dal Moong Nishasta Be-Abb, Dahi Bara, Puree, Peaches Mount Everest, Basket sweets, Nilgiri Coffee.

Coming after discussions on food shortages and how engineers should help in increasing food production, the banquet was a bit of an anti-climax, but I suppose engineers have to live first, to let others live afterwards! Incidentally, the definition of an after-dinner speech given by Lord Citrine at the banquet is well worth repetition: "It must be, like a lady's dress, long enough to cover the subject and short enough to be provocative!"

INDIA'S INTERNATIONAL ENGINEERS' EXHIBITION

THE biggest international engineering exhibition to be held ever in the East opened at New Delhi on January 11.

Mr. N. V. Gadgil who opened it said: "It has been a happy decision to hold this Exhibition at the same time as the meetings of the three major International Engineering Organisations, namely the World Power Conference, the International Commission on Large Dams and the International Commission on Irrigation and Canals. This will enable a better understanding of the objectives of these conferences and give people a realistic appreciation of their own problems and the steps which are being or should be taken for the solution."

He added: "This Exhibition has come at a most opportune moment for India as we have only recently embarked on a number of major river-valley projects with still others to follow in the near future. With the help of these exhibits the common man will be able to visualise for himself the shape of things to come and to follow with understanding the purpose and technique of each development scheme."

Mr. A. N. Khosla who presided over the opening ceremony said: "This Exhibition is truly international in character with an essentially Indian background. India is on the threshold of a new crea of resource development in which man and machine will work in balanced effort for the material advance of the people...The Exhibition has a special significance and message for the undeveloped areas of the World."

The entrance to the exhibition represents a working model of a dam with tunnels on either side. As one enters the exhibition through a tunnel, one sees a huge relief map of India. On the Himalayan peaks stands a beautiful marble statue of Mahatma Gandhi, the Father of the Nation.

MR. N. V. GADGIL is seen cutting the ribbon to declare the Exhibition open.

The mountains and rivers of the country, some of the more important towns and existing as well as proposed river-valley projects are all shown on the map.

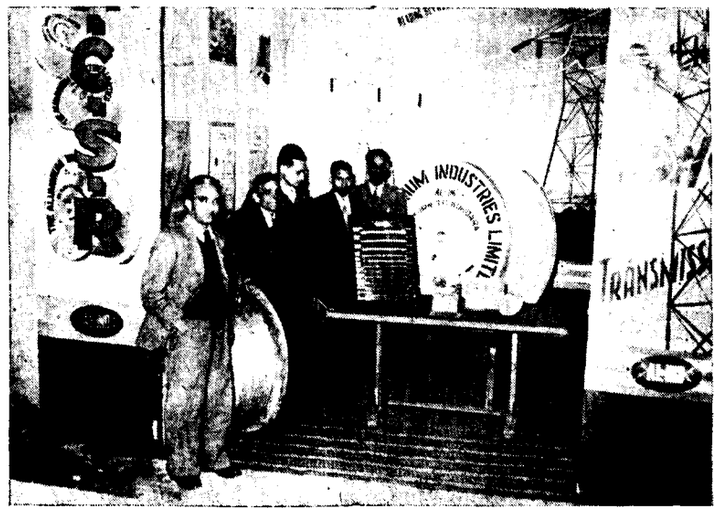
All around the map are the exhibition halls representing the Irrigation and Electricity Departments of the different Indian States and allied organizations like the Geological Surveys of India, Meteorological Department, Railways—and private Industry.

Participating countries include: Algeria, Austria, Ceylon, Finland, France, Germany, Hungary, Italy, India, Japan, Morocco, Norway, Portugal, Sweden, Switzerland, the U. K., the U. S. A. and Yugoslavia.

The Madras Government Electricity Department stall would appear to be the biggest 'draw' of the exhibition, if the long queue before it, most of the time, is any indication.

France has also put up a very good show—with live and still models of generating sets, etc.

Sister companies who participated in the Exhibition are the Aluminium Industries Ltd., Kundara, and the Fertilisers and Chemicals, Travancore, Ltd., Alwaye.



THE ALUMINIUM INDUSTRIES' STALL at the Indian International Engineering Exhibition, New Delhi.

The Aluminium Industries stall was designed by Mr. R. Parthasarathy, our Publicity Officer, and executed at Tiruchirapalli, under his supervision.

Mr. V. Ramaswamy of the Establishment Section rendered him valuable assistance.

The next afternoon was reserved for a visit to the International Engineering Exhibition. The exhibition was open only to the delegates and representatives of the respective governments and industrialists were present to conduct the guests round. As I said, the Madras Government Electricity Department stall attracted the most attention.

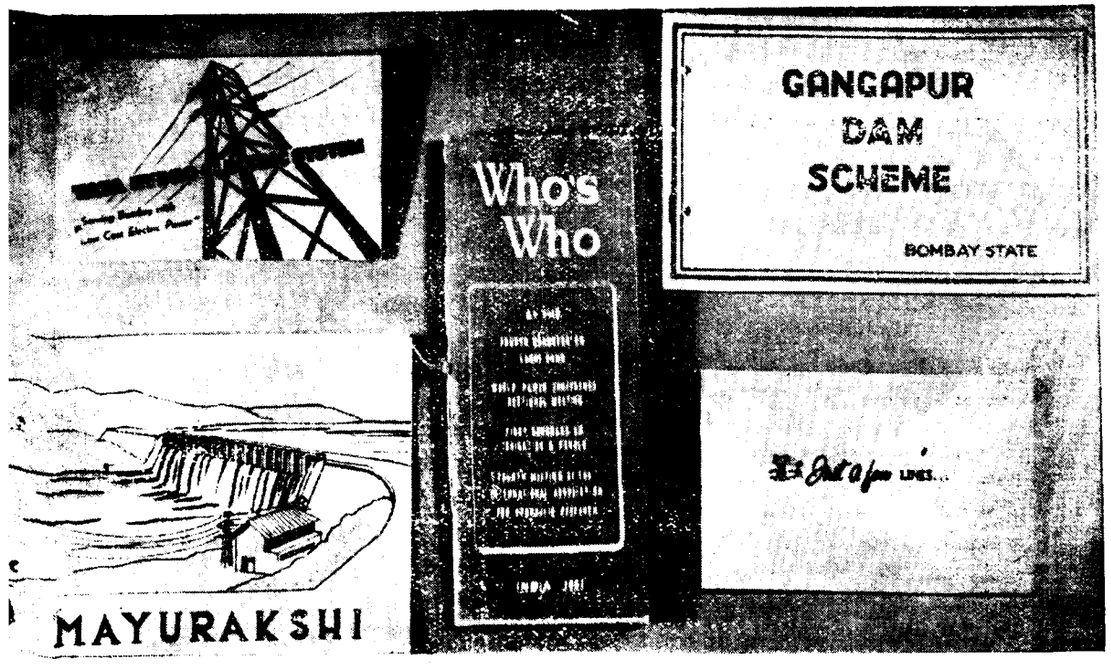
Our two little stalls, though in a corner (Aluminium Industries and FACT) also received a lot of attention, particularly because of the general interest in aluminium conductors and in chemical fertilisers.

That evening President Rajendra Prasad was at home to the delegates at the Government House. After tea on the lawns of the Government House, during which the President moved freely among the guests, a dance recital was held at the Banqueting Hall. This was greatly appreciated by the guests.

I must not forget to mention the visit of the delegates to *Rajghat* on Thursday, Jan. 11, when wreaths were placed on Gandhiji's *Samadhi* on behalf of delegates from 34 nations by the Presidents of the World Power Conference and the International Commission on Large Dams and by the Vice-President of the International Commission on Irrigation and Canals.

A study tour was also arranged after the conferences, for the delegates who had expressed a desire to visit all the important engineering projects of our country.

I understand that tour was a great success.



It pays to advertise—well!

AT the Indian International Engineering Exhibition, New Delhi, one came across a few examples of exceedingly well-produced sales literature, but along with them, some indifferent specimens were, also, in evidence.

It is a pity that several business houses in India, and some of our State government departments, too, do not fully realise that the technicalities of layout cannot simply be left to the little printer round the corner, that nothing does so much to nullify impressions as bad or crude art-work and that good copy cannot just be " dashed off ".

As one author puts it: " Good copy has to be written and re-written, elaborated in parts and reduced in others until the result, paradoxically enough, looks as if it had been dashed off " — so easy and persuasive must be the finished copy. Attractive layout, smart art-work snappy titling and persuasive copy are all important aspects of a printed job—aspects to which only specialists can pay sufficient attention.

It is to be hoped that the International Engineering Exhibition, in addition to fulfilling the purposes for which it was primarily organised, also fulfilled the incidental purpose of bringing home to business houses the importance of producing well-designed and well written sales literature.

Freedom From Foreign Bread

Staff Contribution to "Grow More Food Campaign" in the East-Ramnad Area.

(We have received a heartening bit of news from East Ramnad—our staff have brought under the plough about an acre and a half, and they hope to be able to get about 20 bags of paddy around Tamil New Year's Day.

Now, read for yourself the 'story' filed in by our Engineer at Paramakudi, Mr. K. R. Krishnamurthi, who besides being an agriculturist and a horticulturist would appear to be something of a humorist too!).

The constant exhortation of our Prime Minister that each of us play his part in making our country self-sufficient really made us launch on this experiment.

We first brought under cultivation a vacant piece of land of about an acre and-a-half on the western side of our office main building. *Ragi* and *Cholam* were mainly sought to be grown; less ambitiously, we had also plans for a small kitchen garden.

The results were none too good—in any case nothing to write Head Office about!

Local experts said that our water was unsuitable. The Chemist of our Honorary Advisory council said that the potassium present hereabouts was a most mischievous element and that we had to do something about-or-to it. He suggested, for our adoption, a complicated chemical formula in which he used most of the letters of the English alphabet, reinforced by about an equal number of numerals! For our benefit, he patiently described on the surface dust, several geometrical diagrams. He left us all happy—having really taught us something or gone on that illusion—and although we adopted his formula, I am sorry to say that results were once again disappointing.

One day our Superintending Engineer came—saw—and conquered!

He asked us casually how it was that we had not thought it fit to get the river water. I thought he was indulging in a leg-pull, but an S. E. being an S. E, I dared not tell him anything! I learnt shortly afterwards that he meant business and he wanted us to complete the sanctioned improvement of the colony water supply and make use of the river water for cultivation. No time was lost in completing this work, and I soon found that I had more water than I knew what to do with.

Again, the Honorary Advisory Council was consulted, but the Members agreed to differ!

Then we consulted Irrigation Engineers who gave us an estimate for a project! Absolutely priceless chaps these—they would not touch even with a barge pole any scheme costing under a crore of rupees and taking less than 15 years!

A visiting friend from Tanjore one day remarked to us that our place was as swampy as his paddy fields. That gave us ideas—rather the germ of a gem of an idea was there. We started paddy cultivation. And very much to our surprise we have raised an excellent crop, and we hope to be able to get about 20 bags of paddy during April—on or about the Tamil New year's day.

We are certainly proud of our achievement. Why, even a hen cackles after laying an egg; if it is not a paen of joy to the high heavens—a modest (*sic*) outburst of maternal pride—I don't know what else it is!

—K. R. K.

BRITISH ELECTRICITY AUTHORITY AT WORK

by

HERBER TRACEY,
(of Britain's Trades Union Congress)

In this article HERBERT TRACEY describes the re-organisation that has been carried out by the British Electricity Authority in the last few years. He discusses employer-employee relations in this important nationalised industry and points out that, over the last decade, consumption of electricity in Britain has doubled.

In view of the fact that the Chairman of the British Electricity Authority LORD CITRINE, was one of the delegates to the World Power Conference recently held in New Delhi, this article is of special interest.

THE British Electricity Authority is one of the largest employers of labour in the United Kingdom. It has 170,500 workpeople on its pay roll. More than 117,000 of them are manual workers, and there are over 53,000 in the engineering, administrative and clerical grades. Eleven per cent of the Authority's employees are women.

Employer-employee relationships in a great nationalised undertaking of this description are a matter of increasing importance to trade unionists. How these relationships are developing is revealed in the second annual report of the Authority, which covers the 12 months ended in March 1950.

Comprehensive machinery has been set up to deal with terms and conditions of employment in the elecricity supply industry. This machinery operates in an industry which has been expanding over a long period, before it was taken over under the 1947 Nationalisation Act. A classification of staff personnel existed for purposes of national negotiating machinery, but it did not provide a precise analysis of functions or skills. Among the more than 117,000 classified as manual workers, for example, the

Authority found electricians, steam turbine drivers, installation inspectors, electrical and mechanical fitters, linesmen, turners, riggers, welders, labourers, meter readers, collectors, meter testers, and a long list of other functionally diversified operatives.

NEW GRADES

There were also among the administrative and clerical grades engineers and others with technical qualifications who were, in part, engaged on administrative, managerial or executive functions, as well as secretarial, accounting, legal, commercial purchasing and transport officers, show-room staff, house-craft advisers, sales representatives, and ordinary clerical workers.

One of the immediate tasks of the Electricity Authority after taking over was to establish new grades, and alter duties and responsibilities of many existing grades, as a basis for the revision of salaries and wages agreements. The classification has been simplified by the introduction of a twofold functional arrangement for manual and engineering, administrative and clerical staff. By the middle of 1949 revised salary arrangements were completed and interim salary ranges were replaced by permanent scales for the administrative and clerical grades. Discussions continued on the proposed negotiating machinery for managerial grades.

Side by side, and step by step with the Electricity Authority's consideration of this problem of classification, there has come into existance, a remarkable system of negotiating machinery, established by agreement with the organisations representing the various classes of workpeople. There is a National Joint Industrial Council for manual workers, with 15 District Branch Councils and also local works committees; a National Joint Board for technical engineering staff, with 15 District Joint Boards, is now functioning. For the administrative and clerical grades there is another National Joint Council, with 15 District Joint Councils, and also local staff committees. Another National Joint Committee for building and civil engineering workers is in operation, with arrangements for local consultation.

IMPORTANT RE-ADJUSTMENTS

Through the operation of this machinery, increases in hourly wage rates, revised methods of paying shift workers for hours worked on Sundays and public holidays and similar re-adjustments in wages and working conditions have been made. Permanent salary scales, for instance, have been agreed upon between the Authority and the National Council for general clerical, shorthand and typing grades, machine operators and secretaries to departmental heads.

The general clerical scale now ranges from £ 135 at 16 years of age to £ 385 for men and from £ 108 to £ 308 for women; and up to 26 years it is based on age. Salaries for shorthand typists range from £ 135 to £ 335, and there are two grades for private secretaries, with salary ranges

of £ 310–£ 390 and £ 390–£ 450. Payment is made for overtime. These are the salary scales for these grades working in the provinces of Britain. There are additions varying from £ 15 to £ 40 according to salary for workers in the London area. The working week is normally 38 hours.

Apart from organising, the machinery provided for the negotiation of terms and conditions of employment, the Electricity Authority has played a pioneer part in setting up machinery for the discussion of such matters as safety, health, welfare, efficiency, education and training. For the purpose of joint consultation on these matters, in agreement with the appropriate organisations of workpeople, a National Joint Advisory Council has been established with 15 District Joint Advisory Councils, and about 500 local advisory committees.

LOCAL ADVISORY COMMITTEES

Decisions taken by this Council on every aspect of workers' welfare become recommendations to the Electricity Boards. So much importance is attached to the Council's work that seven members of the Authority, all the Divisional Controllers, and the Chairman or Deputy Chairman of almost all the Area Boards regularly take part in it. Illustrative of the operation of this Joint Consultative machinery is the constitution of the local advisory committees. These consist, in most cases, of the members of the works committee set up under the national Joint Industrial Council for manual workers, along with elected representatives of the technical, engineering and the administrative and clerical grades. Appropriate modifications are made in the constitution for the appointment of additional members representing works or staff committees.

Consideration of such subjects as improvement in methods of work, accident prevention, ventilation, lighting, washing facilities, technical libraries, sports and social clubs and the like, is given by these advisory committees. Much interest is taken, too, in schemes for the education and training of employees, and especially of manual workers.

This is the pattern of industrial relations in a great nationalised industry which is expanding year by year. The Authority also comments in its report upon the striking advance of electricity supply, despite the handicaps on development imposed by six years of war and five years of difficult post-war economic conditions.

Current Topics

KHAPERKEDA POWER STATION

"Switzerland is a small mountainous country but every home is provided with electricity. The watches you use come from Switzerland. They are manufactured at home. Electricity is used there for cottage industries. If we could reach electricity to every home in the country, we will also be able to develop our industries, for an Indian was in no way inferior to others in calibre", observed President Dr. Rajendra Prasad declaring the Khaperkeda Power Station open on December 27.

An important step in the implementation of the Madhya-PradeshGovernment's plan of providing the nucleus of a State Electric Supply System was taken when the President formally declared this station open.

To ELECTOLITE readers a point of special interest will be that Mr. V. Seshasayee is the Commerce Member of the Madhya-Pradesh Electricity Board. The other members are Col. E.G. Mackie, (*Chairman*) formerly Chief Engineer and General Manager of the Madhya-Pradesh Electricity Department, and Mr. S. Raghavachar, formerly of the Mysore State Government service.

The indefatigable Secretary of the Board is Mr. R. Srinivasan, with whose name older employees of this Corporation should, doubtless, be familiar—he served a brief spell of apprenticeship with it.

To revert now to the power Station :

Situated twelve miles from Nagpur, this Power Station will have an initial generating capacity of 20,000 kW. which will be raised to 30,000 kW. by September, 1951. It will be connected to 840 miles of transmission lines, feeding 21 main substations situated in Nagpur, Amaravati, Akola and other places in Berar, the Pench and Chanda coalfields and the Manganese mines areas.

All the substations are expected to be put into commission between January and June, 1951.

The population that will receive immediate benefit from the Khaperkheda supply is about 820,000 mainly in sixteen towns of the State. Ultimately, however, some 300,000 people will benefit in an area of 12,000 sq. miles.

Inter-connected with Khaperkeda station will be the station now under construction at Chandni and a projected station in Ballarpur.

CUT IN POWER SUPPLY

"Owing to the failure of the north-east monsoon again this year in the Mettur catchment and the heavy demand for water for irrigation, the Mettur reservoir level is going down rapidly. Further, due to the late commencement of irrigation in 1950, irrigation issues from the Mettur reservoir may be needed till the middle of this month. The inflow into the reservoir this summer is also likely to be poor," states a Press Note issued by the Madras Government.

The Press Note adds :

"Owing to these factors, power generation at Mettur will be much curtailed and relief to the areas served by the Mettur system has to be obtained from the Pykara and Papanasam systems through the inter-connected grid. In addition, maximum relief possible from Madras will be obtained. Further more, the new Madurai thermal station with 4,000 kW. capacity is expected to go into service in the course of February and it will relieve the power shortage to some extent. All the available power will be distributed equitably througout the hydro-electric area. The power position this year is, therefore, not so bad as last year. Even so, taking the overall situation, there wiil be a net deficit of power of about 15 per cent in the coming months before the south-west monsoon sets in.

In the circumstances, the following measures are unavoidable and have to be observed throughout the hydro-electric areas with immediate effect : (1) grouping of rural loads in two batches, each batch working for ten hours a day in alteration, outside the evening peak load period ; (2) staggering of holidays and recess hours of all industrial establishments supplied with H. T. power suitably to give maximum relief in power demand.

There will be a small cut in power consumption of 15 per cent with effect from February 15 on all uses, except very essential ones like agricultural pumping, hospitals, drainage pumping, water supply, railways, etc. It is expected that the power shortage during the summer months can be tided over with the proposed cut of 15 per cent.

Consumers in the hydro-electric systems are requested fully to co-operate with the Electricity Department in the measures proposed to be taken. The restrictions and cuts will be withdrawn immediately after the water position improves."

ELECTRICITY FROM WASTE HEAT

A plant to trap waste heat from a gas works and convert it into electrical current through a gas turbine engine is to be constructed soon in the West Midlands ot Britain. Waste heat is used, in most gas works in a heat-recovery unit, which is employed to fire boilers for power or process steam raising, but the industrial gas turbine engine, adapted from the air craft jet engine, is particularly suited to running on waste gases, and it will provide power by driving an electricity generator.

INDIA'S FAN INDUSTRY

The electric fan industry in India is stated to have made considerable progress in recent years. Production during the first quarter of 1950, for example, showed an increase of 25 per cent over output in the corresponding period of 1949. For the six months ended June 1950, a little over 100,000 fans were manufactured, compared with 165,000 for the whole of 1949.

POWER GOES TO NEW MINISTRY

After the recent re-allocation of portfolios in the Cabinet, that of Power will be handled by the Ministry of Industrial Research and National Resources headed by Mr. Sri Prakasa, the former Commerce Minister.

THE " DUNKIRK " SPIRIT

At the first annual meeting of the North Coast Midland Section of the Electrical Power Engineers' Association held at Wolverhampton recently Mr. H. F. Carpenter, the B. E. A. Secretary said that they were putting the Dunkirk spirit in the provision of new power stations.

In ten years, he added, it was expected that the number of units at present generated would be doubled.

NEW USE FOR CASTOR OIL

Castor oil is the basic raw material for a new plastic developed by the *French Societie Organico*: it is considered suitable for use in electric household appliances and as cable-insulting material. Manufactured in all colours, transparent and opaque, this is being marketed under the trade name of ' Rilsan '.

South Madras Electric Supply News

I. *New supplies:* During the quarter ended December 1950, supply was rendered to two villages—Somarasampettai and Mahendramangalam.

(1) *Somarasampettai:* At a small function arranged at the local church, on November 30, with Mr. Sowrinathan, Personal Assistant to the District Collector, presiding, Mr. H. K. Ramaswami, our Dy. Chief Engineer, switched on the supply. Five street lights, one rice mill—that of Mr. Subbiah Chettiar—twenty houses and one " Touring Talkie " now receive supply. A 50-kVA transformer and a few spans of L. T. feed the village.

(2) *Mahendramangalam:* Electrification of this village formally began on December 15, with our Resident Engineer at Kulithalai, Mr. L. G. Natesa Iyer, switching on the supply. Special construction staff from Head office were deputed for this job. One rice mill and ten house services are shortly coming up. A 11-kV line, about one-and-a half miles long, was tapped off the Thottium feeder to render this supply. A 30-kVA substation was erected.

II. *Agricultural Power:* About 150 acres of land came under lift irrigation in the area served by this Corporation during the quarter with 120 H.P. of pumpsets coming into operation. Of this, a little over a 100 H.P. was installed in the Trichy-Srirangam area, important villages benefiting by this, being Thuraiyur, Manapparai, Lalgudi and Tirupalathurai. In the East-Tanjore area, about 10 H. P. of pumpsets was installed, Shiyali, Mannargudi, and Vedaranniyam benefiting principally. In the East-Ramnad area, Paramakudi, Ramnad and Manamadura were able to bring more acres under the plough, with an installation of about 15 H.P. of agricultural pumpsets.

III. *General:* Supply was effected to the Dayapuram Hospital and Homes for Lepers with a 5-kVA transformer substation and an extension of 1000 ft. of H. T. lines, tapped off the Sivaganga—Manamudura 22-kV feeder.

Run by the Mission to Lepers, this is a charitable institution giving free boarding, lodging and treatment to about 300 in-patients.

IV. *Rice Mills:* Rice Mills connected during this quarter are:—

Name of village	*Owners*	*H.P.*	*Technical details.*
Nangavaram	Mr. V. Viswanatha Iyer	15	Existing transformer increased to 50-kVA.
Perugamani	Mrs. Jayalakshmi Ammal	20	New 30-kVA transformer.
Adirampatanam	Mr. A.R.A. Karupiah Nadar	15	Existing 50 kVA increased to 75-kVA.
Moolangudi	,, V. Karupiah Thevar	25	New 30-kVA transformer.
Paravakkottai	,, R. Jayaraman	20	,,

V. *Railway stations:* Stations electrified during this quarter are:

(1) Nidamangalam and
(2) Thiruthuraipundi.

Both are important railway junctions.

Strictly Personnel

Apologies : Well, well, we seem to be meeting after quite a long time. The interval of three months between one number and another is bad enough, but because of the World Power Conference, we had to advance the date of publication of the present number by yet another month. We are so sorry for the delay, but we sincerely hope that the contents carried currently will be some compensation for it.

'Dishing up' PONGAL : Who said that our staff could not vegetate, we mean, grow vegetables ? Our Karaikudi staff, for instance, would seem to have had the (vegetable) kingdom come to them ! The important festival of Pongal, it would appear, was completely *dished up* by them—with vegetables grown in their office compound ! Congratulations !

The Poet Cornered : We knew that our staff were versatile and that their gifts ranged from astronomy to vermeology, but we never suspected that there were poets amongst them; as witness, for example, an offering (not burnt) you know, what we mean, sent in by one of our out-station bill collectors. More original than those who rhyme *June* with *Moon* and *Telephone* with *Alone*, our versifier rhymed *Gulf* with *Myself* ! But more interesting than his poem was his covering letter – a portion of which we would like to adopt here :—

> " I humbly request you, honoured sir, to be kind enough to publish my poem in your magazine, at least in a *corner* of it, and thus enable me to write more articles better than this enthusiastically. "

He had also given it a learned title, but we rather thought that it called for a much simpler one—and a slightly different treatment. Being ourselves addicted to the vile habit of versifying, we re-wrote it, and if you can stand a stiffish dose of Pierian waters, here it goes :

WHERE THERE'S A BILL.

Smart, streamlin'd and witty,
And composed after Kipling,
Maybe, a departmental ditty
Is this Magazine's very thing.

Yet, I can't pretend to sing
As well as he did :
To poesy's un-crowned king
I must tip off my lid !

Still, my pedestrian Muse
Can reel off a tale ;
She's no dame to refuse—
To sing of electricity sale.

E'en a bill-collecting mission
To a village on the border,
Like nuclear fission,
May be a tall order.

Where I am stationed
The sky always roars ;
There, rain is not rationed
There, it always pours.

But to keep the home fires burning
And the wolf from SME's door,
I must go on earning—
Or, the share-holders swore !

So, seized I by the handle
My velocipede of a vehicle ;
Lacking bell, " Brooks " and candle—
But loosely a cycle.

I pedalled on the bone-shaker
And got somehow to my journey's end;
For witness, there's my Maker—
The party wanted me to lend—

Some little ready money
To settle his pending bill !
And I died, my lips forming, " Honey,
—No time to make a will ! "

ENVOY

After 'died' add 'nearly', aye,
that's the word,
Otherwise, this story will be
totally absurd !

—R. P.

ELECTOLITE—Printed at The Trichinopoly United Printers Ltd., Tiruchirapalli.
Edited and Published by R. Parthasarathy, M A.,
for The South Madras Electric Supply Corporation Ltd., Tiruchirapalli.