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1953-11
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September 1953

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AND

OTHER USUAL FEATURES.

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Cover Photo

Water gushing out through the gates of the surplus sluices
(Ellis Saddle), when level in Mettur Dam exceeded 120 ft.

**India's contribution under the
Colombo Plan**

ONE of the original sponsors of the Colombo Plan. India is in a unique position of being both a donor country and a receiving country. While she has received assistance from some of the advanced countries in the Plan, India has also been able to render assistance to many of the countries in the South and South East Asian region mainly by making available the services of her experts and providing training facilities to foreign students in Indian institutions, many of which are well advanced to stand comparison with similar institutions in foreign countries. The contribution of the Government of India to the 8 million-Technical Co-operation Scheme of the Colombo Plan is £ 750,000 (or about Rs. 1 crore).

Till 1952, India had provided five experts and nearly 75 scholarships to the countries of South and South East Asia. During the current year, the names of 39 experts drawn from various specialised fields have been communicated to the Bureau of Technical Co-operation, Colombo Plan. Training facilities to foreign students have

been offered in India's multi-purpose river-valley projects and in the scientific and technical institutions in the country.

One of the Centres in India in which training is at present being provided to foreign students is run under the auspices of the Indian Statistical Institute, Calcutta, where since October, 1950, an International Statistical Education Centre has been opened through the joint co-operation of the International Statistical Institute with support from the UNESCO and the Government of India. At this Centre which is administered by a Board of Directors with Professor P. C. Mahalanobis, Director, Indian Statistical Institute, as Chairman, training has already been provided for a period of three years split up into five terms of six months' duration and a special course of two months.

During the last three years, 200 students from 15 foreign countries received training at this Centre in various statistical subjects. The trainees came from such countries, as

Afghanistan, Burma, Ceylon, Indonesia, Japan, Nepal, Phillipines, Pakistan and Thailand.

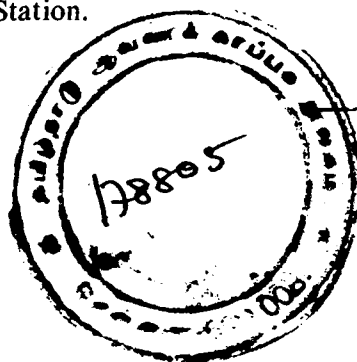
Another institute in India which is training foreign students and for which the Government of India have rendered assistance under the Colombo Plan Technical Co-operation Scheme is the Central Rice Research Institute, Cuttack. In this Institute, an International Training Centre on Rice Breeding was opened in 1952 under a joint programme of the Food and Agricultural Organisation (U. N.) and the Government of India.

Training was imparted to 23 students drawn from Ceylon, Egypt, France, India, Indonesia, Iran, Laos, Pakistan, Phillipines and Thailand. The training course consisted of lectures, practical demonstrations, seminars, symposia, and excursions. Besides providing training on various aspects of rice breeding, the trainees were taken to rice tracts in Orissa, the Research Centre at Chinsura and Burdwan, saline paddy areas in Diamond Harbour in West Bengal, the Rice Research Centre in Sabour and Patna as well as the Central Potato Research Station.

The Government of India Customs House at Bombay provided training to a Customs Officer from Ceylon under the Colombo Plan for a period of three months.

The Indian Institute of Sugar Technology, Kanpur, provided training to two students from Ceylon for about nine months in various aspects of sugar technology. The trainees joined the Sugar Boiling Certificate Course which consisted of four months' theoretical training in the Institute followed by practical training at its Experimental Sugar Factory at Nawabganj, Kanpur, and also at Daurala Sugar Works, Meerut District, U. P.

Three trainees from Ceylon received training at the All-India Radio. Of these, two had specialised training on programme, planning field-work connected with rural broadcasting and "Farm Forum" and the third on Tamil music and listener's research, specially in music and rural programmes. The training was given at A. I. R. stations in Madras, Bombay, Delhi and Tiruchi.



Manufacture of Calcium Superphosphate*

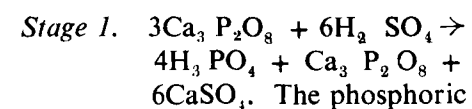
K. V. SUBRAMANIAN.

As early as 1840, the well-known scientist, Liebig, experimenting with bones, worked out the process for the manufacture of calcium superphosphate. But it was only in 1842, T. B. Lawes developed on Liebig's work and obtained a patent. In 1862, the manufacture of super on a large scale was taken up.

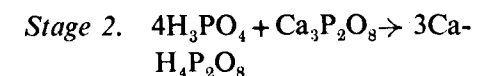
MANUFACTURE

Superphosphate can be manufactured either from bones or from rock phosphate. In India, rock phosphate is largely used as the raw material.

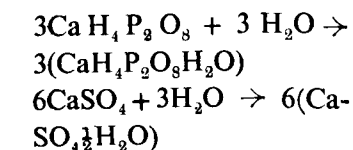
The main chemical reaction in the manufacture of superphosphate is the conversion of insoluble tri-calcium phosphate into soluble mono-calcium phosphate. This is brought about by the action of dilute sulphuric acid on finely-ground rock phosphate. The mechanism of the reaction is represented in three stages.



acid liberated in this reaction converts a further quantity of tri-calcium phosphate into mono-calcium phosphate.



Stage 3. Mono-calcium phosphate and calcium sulphate take up the water of crystallisation, and thus the process continues throughout in the reaction den, as well as when the reacted mass is stored for maturing.

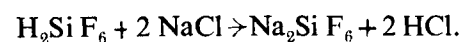


Rock phosphate also contains along with tri-calcium phosphate, calcium carbonate, calcium fluoride, magnesium carbonate, sodium chloride and other substances in varying proportions. These compounds also react with

* From a paper on 'Chemical Fertilisers' read before the Society of Technologists.

sulphuric acid and form corresponding sulphates with the evolution of gases consisting of carbon-di-oxide, hydrogen chloride, hydrogen fluoride, etc. These gases are sources of trouble, the last one, in particular, causing irritation of the mucus membrane and are, therefore, scrubbed with water.

$\text{CaF}_2 + \text{H}_2\text{SO}_4 + 2 \text{H}_2\text{O} \rightarrow \text{CaSO}_4 + 2\text{H}_2\text{O} + 2 \text{HF}$
 $\text{SiO}_2 + 4 \text{HF} \rightarrow \text{SiF}_4 + 2\text{H}_2\text{O}$
 Silicon tetrafluoride is reacted upon by water and hydrofluorosilicic acid is formed. This is then reacted with sodium chloride to give sodium silicofluoride.



OCCURRENCE OF PHOSPHATE ROCK

Phosphate rock is a sedimentary deposit containing tri-calcium phosphate of lime. It occurs as a hard rock interstratified with beds of sand-stone and other sediments.

Phosphate deposits in Western U.S.A. and North Africa are of this type, while those that occur in the United States (Florida) England, Eastern France, and Russia are of the amorphous nodular type. A good sample of hard rock phosphate has the following analysis:

Tri-calcium phosphate
 of lime 83.14 per cent
 [Phosphorus pentoxide.. 38.07 %]

Carbonate of lime	.. 3.63 per cent
Oxide of iron	.. 2.26 %
Oxide of Aluminium	.. 1.52 %
Silica	.. 4.13 %
Calcium fluoride	.. 4.4 %
Water	.. 0.92 %

The development of Moroccan phosphate mining began in 1921. Moroccan deposits are estimated at over one billion tons. The phosphorus pentoxide content in Moroccan rock works out to 34.22 per cent (about 75 per cent as tri-calcium phosphate with very little iron oxide, as low as 0.3 per cent, and 0.4 per cent alumina (fluoride of calcium 5.23 per cent)

Phosphatic deposits occur in South India (Tiruchirapalli) and Bihar. The reserves of Tiruchi deposits may be taken to be about 8 million tons. The poor quality of the mineral in regard to its phosphorus pentoxide content and the presence of unduly large amounts of impurities such as calcium carbonate, aluminium oxide and fluorides militate against the use of these deposits. It is estimated that about 2 million tons of phosphatic deposits of a better quality can be extracted from Bihar.

MANUFACTURING PROCESS

The manufacturing process is divided into three steps: (i) Reduction of phosphate rock to fine powder (ii) Mixing sulphuric acid with rock

phosphate (iii) Maturing process for completion of the reaction

The phosphate rock is ground in a ball mill. Different types of crushers are used, such as, for instance, the ring-roll mill, the Raymond mill, the swing sledge mill, etc.

It is outside the scope of this paper to deal in detail with the various types of mills, but it may, however, be mentioned that the ring-roll mill is about the best type for pulverising rock phosphate.

Three types of processes are in vogue: (i) Batch process (ii) Continuous process and (iii) Oberphos process. In the batch process, weighed quantities of the ground phosphate rock and acid are reacted in a mixer, and after a few minutes of reaction, discharged into a den below. In the continuous process, a continuous mixer and a continuous den are employed. The Oberphos process is a unique process, intermittent in operation, and involving the use of an autoclave.

The three processes are briefly described hereunder:

The Batch Process: There are two types of mixers adopted in the batch process for mixing the reactants. One is the vertical type, and the other the horizontal. Because of easy discharge

through the bottom, vertical types of mixers are preferred. Mixing is carried out by paddles on a vertical shaft. (See Fig. 1). The charge is stirred in the mixer for two to three minutes, and is then discharged into a den below.

The mixer used for the manufacture of superphosphate at Mettur is a vertical type. It consists of a cast iron pot with an outlet opening in the bottom sealed with a plug valve. The pot is covered with a dome-shaped casting which carries one of the bearings for the vertical shaft. In the dome-shaped cover there are three openings: (i) a rectangular opening for the ground phosphate to enter (ii) a circular opening for the acid inlet pipe and (iii) a square opening for the escape of toxic gases. The vertical shaft is made of wrought iron. Cast iron gates, securely bolted together, grip the shaft. These act as stirrers and mix the phosphate and acid thoroughly. The vertical shaft is driven through a bevel gearing, and it revolves at a speed of 20 to 40 revolutions per minute. The whole equipment is assembled over a den built of masonry rectangular structure, and provided with a doorway at one side and an opening at the top of another side to draw out the gases from the den. The toxic gases outlets in the mixer and in the den are connected to the suction side of an exhaust fan

through a duct where the gases are scrubbed with water.

Each charge fed into the mixer consists of equivalent quantities of ground rock phosphate and sulphuric acid, say, 2 cwts of rock phosphate and 2 cwts of acid. Measured quantities of the phosphate and of the acid from intermediate measuring or weighing tanks, are fed into the mixer simultaneously. It is so timed that the duration of pumping of the entire quantity of acid corresponds exactly with the duration of feeding of the whole of the rock phosphate charge. The outlet is opened after the reaction and product discharged into the den. After allowing sufficient time for "curing" in the den for the reaction to get completed, the superphosphate mass is raked out.

For increased output, the modern practice is to have two dens operated below the mixer with two discharge chutes which can be controlled. While the super mass is being discharged from the mixer into one den, the mass in the other will be conveyed out to the curing yard.

The continuous process: The continuous processes employ continuous type, mechanical dens and excavators. In the popular Broadfield process (See Fig 2), ground phosphate rock and the acid are fed continuously to

the mixer. The mixer consists of a trough placed horizontally, and having two compartments, one for mixing and one for kneading. A square shaft provided with specially designed paddles revolves in the trough. The mixer is kept under a strong suction by means of an exhaust fan. The gas and steam evolved during the reaction are withdrawn by this fan. The reacted mixture of phosphate and acid fall from the mixer into a moving endless conveyor den below which conveys the mass towards a set of revolving knives or cutters. These shave off the superphosphate which then falls to a belt conveyor which conveys the material to the store.

Oberphos process: Ground phosphate rock and sulphuric acid are rapidly charged into a revolving steel drum lined with lead, called the autoclave (See Fig. 3). Acid used is of the same strength as in the batch process, namely 51 deg. Be. to 52.5 deg. Be. But the temperature of the acid entering the autoclave ranges from 90 to 120 deg. F. Both the acid and phosphate are weighed. The autoclave is a jacketed one. Steam is used in the autoclave to act as an insulating medium and to aid the maintenance of a pre-determined temperature. The drum after charging is sealed off, and direct steam is introduced to the extent of 30 to 50 lbs. of steam per ton of material.

Gradually carbon di-oxide, hydrogen fluoride and some hydrogen chloride are evolved. The pressure obviously accumulates until a pre-determined state is reached. But before this, evolution of the normal decomposition products will be arrested.

The pressure coincides with a specific temperature which is said to be of the order of 150 deg. C. The pressure period lasts for 30 to 40 minutes when the products of decomposition and steam are exhausted. This can be effected in such a way that having regard to the sensible heat of the superphosphate mass, the moisture content is of the order of 11 per cent which relates to a temperature of 50 deg. C. When this temperature is reached the rotation of the autoclave is arrested, the man-hole cover removed and the autoclave is again revolved, in order to discharge the contents.

The batch charge is about 8 tons, and the introduction of the charge takes 90 seconds. The speed of the autoclave is 5 r.p.m.

The mixing valve at the feed-end is of a special type. The acid enters the valve tangentially at an extremely high velocity and the ground phosphate is introduced through the centre.

The dried superphosphate is kept in heaps in roofed sheds, and after

two months of curing, it is dressed to uniform powder by a dressing machine. By means of an automatic filling and packing device, it is packed in gunnies.

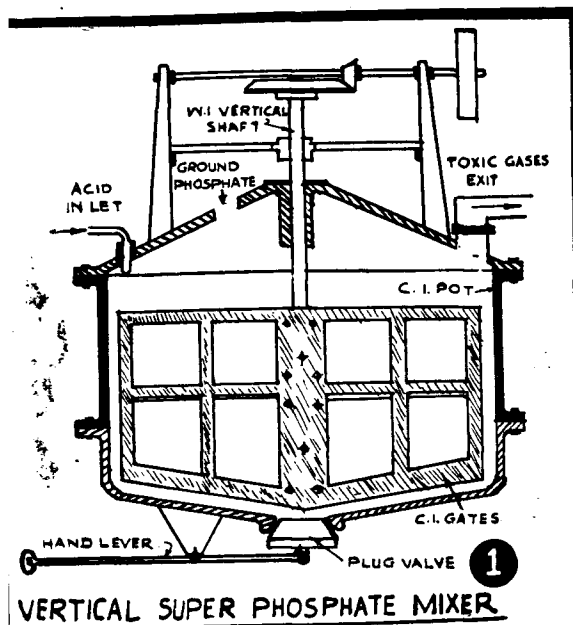
COMMERCIAL CALCIUM SUPERPHOSPHATE

This is sold in various grades containing from 10 to 21 per cent of phosphoric acid depending on the quality of rock phosphate employed. When the combined oxides of iron and alumina exceed 1.5 per cent, reversion of some of the water-soluble acid will occur. Water solubility of the phosphorus pentoxide content is the only basis of sales in some countries whereas water and citrate solubility constitute the basis in other countries.

Calcium superphosphate which has been carefully prepared should not contain more than 10 per cent of water. Di-calcium phosphate should not be absent. The mono and di-phosphates should largely exist in the hydrated form and calcium sulphate should exist largely as such. The presence of any semi-hydrate or di-hydrate represents super prepared with sufficient sulphuric acid.

BLENDING

Superphosphate is blended with ammonium sulphate and potash and marketed in powder form or granulated variety. The usual proportion



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adopted for a compound fertiliser is as follows :

- 4 cwts per acre of superphosphate,
- 1 cwt of sulphate of potash, and
- 1 cwt of sulphate of ammonia.

Sulphate of ammonia retards the reversion of calcium superphosphate when admixed with calcium superphosphate. But it has a distinct tendency to cake. By using neutral and dry quality sulphate of ammonia, the caking difficulty can, to some extent, be obviated. If a dry medium of bone flour or fine bone-meal is mixed, the mechanical condition of the compound fertiliser can be improved. If the mixture of ammonium sulphate with calcium superphosphate is likely to give a higher percentage of soluble phosphate, insoluble phosphate or gypsum is added.

For potassic-super, either chloride or sulphate of potash is made use of. If chloride is used, the mixture becomes deliquescent on long exposure. Potassium manures have a tendency to dry the superphosphate and to obviate reversion.

Chemical Industries in the Five-Year Plan*

by R. NATARAJAN

INDIA'S First Five-Year Plan provides for a substantial and rapid improvement in agriculture as well as development in industry. The Plan recognises that, while it is necessary to give the highest priority to agricultural development, including basic services like irrigation and power, such a development will result in the availability of a surplus working force which will have to be diverted to the industries and services.

The Plan fixes the following general order of priorities in the industrial field :

1. Fuller utilisation of existing capacity in producer goods and consumer goods industries.
2. Expansion of capacity in capital and producer goods—industries including fertilisers and heavy chemicals.
3. Completion of industrial units—work on which is already in progress.
4. Establishment of new plants to strengthen the industrial structure by compensating for short-fall of

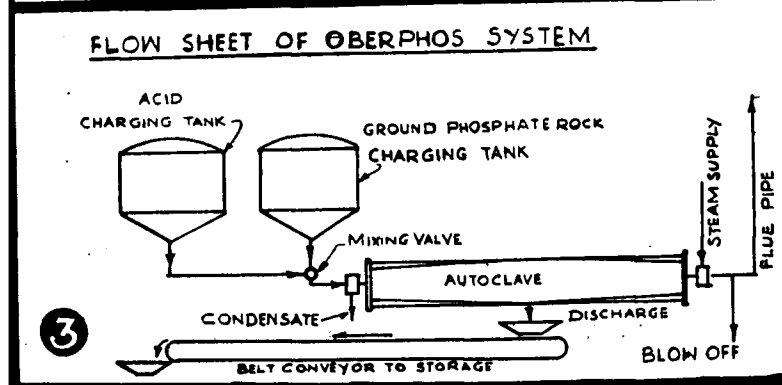
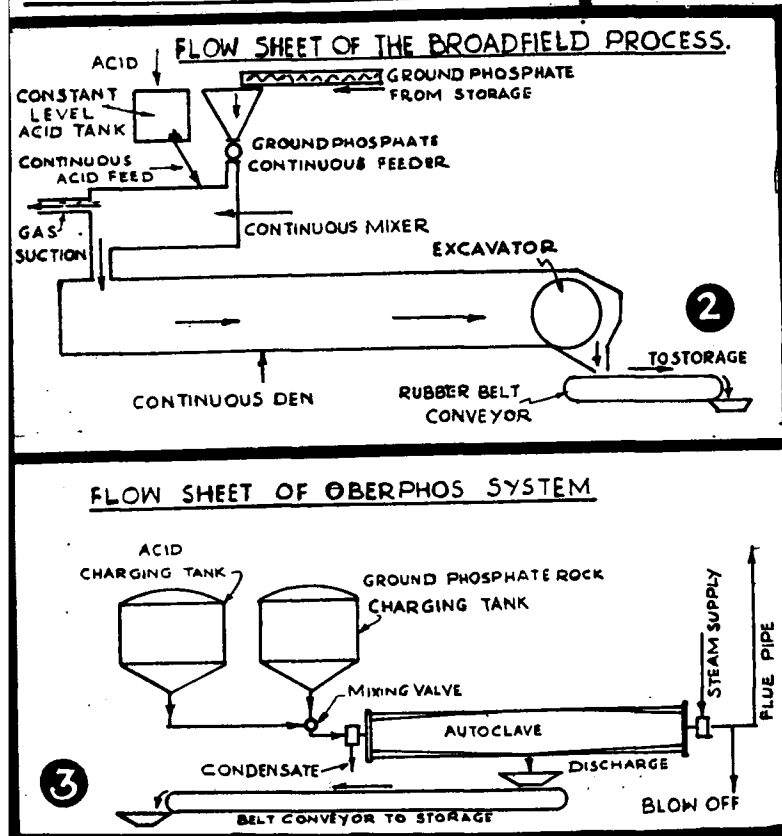
strategic materials like heavy chemicals, sulphur, chemical pulp, etc.

The second World War revealed more clearly than ever the need for the development of the basic heavy chemical industry, depending as the country had been on imports for meeting the needs of the war industries and essential civilian requirements. While some progress was achieved in the manufacture of chemicals like soda ash, caustic soda, chlorine and superphosphate, production was far short of actual demand. In the post-war period, considerable headway has been made in these industries as well as in fertilisers, cement, glass, and drugs and pharmaceuticals.

In the programme of industrial development drawn up by the Planning Commission as part of the First Five-Year Plan, chemical and allied industries receive the importance they deserve—indeed a whole section is devoted to them. Chemical and allied industries are divided into the following major heads :

- (1) Fertilisers
- (2) Heavy Chemicals
- (3) Drugs and Pharmaceuticals
- (4)

* Summary of an address to the Salem Rotary Club.



Paints and varnishes (5) Soap, (6) Tanning and footwear (7) Paper and paper board (8) Cement and (9) Glass.

Some idea of the importance of some of the groups of industries included in the Plan is furnished by the following figures of values of imports during the years 1948-49 to 1952-53:

Commodities	1948-49	1949-50	1950-51	1951-52	1952-53
Chemicals	205	77	91	197	127
Dyes from coal tar	123	80	120	142	75
Paper	134	80	95	132	112
Drugs and Medicines	79	79	99	152	113

Here is a brief summary of the development proposed under each of the nine major heads with particular reference to the part South India will play in the development.

FERTILISERS

Fertilisers are broadly divided into three categories :

- (1) Nitrogenous
- (2) Phosphatic
- and (3) Potash.

Nitrogenous: The most popular fertiliser in this category is ammonium sulphate. It is not generally known that, as in several other fields, pioneering work in this field, also, was done

in S. India. Synthetic ammonia production and its conversion into ammonium sulphate was first started in Mysore in 1938 in a plant established at Belagula. The first plant of its kind in the whole world producing the necessary gas mixture for ammonia synthesis in the production of ammonium sulphate by the use of wood is the Fertilisers and Chemicals, Travancore, Limited. The company was established by Seshasayee Brothers, in 1947.

The Plan estimates potential minimum requirements of ammonium sulphate at 2.25 M. tons per annum. Actual consumption in recent years has been only of the order of 1.5 to 1.75 lakh ton, but some idea of the development possible is indicated by the fact that requirements would be 12 to 13 M. tons if nitrogenous fertilisers are applied on a country-wide basis. The Plan suggests promotional propaganda and demonstration centres at suitable places in the country. Agricultural demonstration farms would make cultivators realise the advantages of the application of synthetic fertilisers.

Expansion in South India will consist of doubling the capacities of the existing plants at Belagula and Alwaye. The target fixed under the Plan for ammonium sulphate in 1955-56 is 4.5 lakh tons, whereas requirement will

reach 6,00,000 tons. The gap will be filled up by imports, which may be cut down, if the scheme to produce urea and ammonium nitrate in Sindri materialises.

Phosphatic: There is one factory each in Madras and Travancore-Cochin, and there are two factories in Mysore producing superphosphate. The estimated minimum requirement is about 1.5 M. tons, but consumption is of the order of only 50 to 60,000 tons, all of which is made in India. The Plan estimates consumption in 1955-56 at 2 lakh tons, and production at 1.8 lakh tons. No difficulty, however, need be anticipated in filling the gap by local production as the sulphur position has eased already.

Potash: Potash finds application only in mixed fertilisers which are important only to the plantation industries. There are certain natural deposits of potash nitrate in India, but large quantities are imported. Requirements are estimated at 37,500 tons.

HEAVY CHEMICALS

Sulphuric acid is by far the most important heavy chemical, and is required in the manufacture of fertilisers as in other chemicals. There is one plant each in the States of Madras, Mysore and Travancore-Cochin. The plant at Ranipet is the oldest. Demand

for sulphuric acid by 1955-56 is expected to reach 200,000 tons, all of which will be produced in India. The capacities of the plants in Madras and Travancore-Cochin States will be doubled. As a result of increased sulphuric acid production, it is anticipated that alum, ferrous sulphate, copper sulphate, and sodium thiosulphate would go up. Hydrochloric acid and nitric acid are also made from sulphuric acid.

Soda ash and caustic soda: Among the alkalies, soda ash and caustic soda are the most important. Both the factories producing soda ash are located in the western part of India. At the present time, soda ash requirements are estimated at 1,15,000 tons and will go up to 1,55,000 tons by 1955-56—of which 77,800 tons or nearly 50 per cent—will be produced in India, the balance being met by imports. It has been suggested that the Tuticorin area may be suitable for the location of a new plant.

The first fully Indian company to manufacture caustic soda, commercially in India, was the Mettur Chemical & Industrial Corporation, Limited, Mettur Dam. There are now seven factories in India, of which two are in South India. Current Indian requirements are estimated at 54,000 tons, and expected to reach 87,000 tons by 1955-56. Production is expected to

reach 33,000 tons, the gap being filled by imports. Liquid Chlorine and bleaching powder requirements will be fully met by these factories. Manufacture of DDT, the chlorine insecticide, is to start under Government auspices at Delhi, and the plant is already under erection.

The manufacture of a large number of heavy chemicals such as calcium carbide, sodium hydro-sulphite and ammonium chloride, are also contemplated—the last in the FACT factory in Travancore-Cochin. It is also proposed to expand potassium chlorate manufacture from 2000 tons to 3500 tons to meet the requirements of the country. The Indian Rare Earths, Limited, a Government enterprise, is already processing the monozite sands of Travancore-Cochin with French collaboration to produce rare earth chlorides and carbonates, tri-sodium phosphate, crude thorium oxide, thorium nitrate, uranium oxide, etc.

DRUGS AND PHARMACEUTICALS

These cover a wide range of items, far too many, to be mentioned individually. Progress so far has been only in certain directions such as tinctures, extracts, galenicals, etc. But many of the raw materials, both inorganic and organic chemicals, are

imported. Penicillin, sulpha drugs, vitamins, streptomycin, quinine salts and patent medicines form the bulk of the imports. A penicillin factory is being set up by Government in co-operation with UNICEF and WHO. In Bombay, at Bulsar, Messrs. Atul products Ltd., are planning, (in collaboration with American Cyanamid Company) the manufacture of sulpha drugs. Schemes for increasing the production of quinine and quinine salts and for the manufacture of Paludrine, PAS, and Insulin are likely to fructify in the near future.

PAINTS AND VARNISHES

In 1951-52, paints and painters' materials worth Rs. 2. 62 crores were imported into the country. But it is interesting to note that India also exported Rs. 0. 68 crore worth of paints, etc., during the same period. Paint requirements are estimated at 35 to 40,000 tons and are expected to go up to 60,000 tons in 1955-56. Among the more interesting developments anticipated in this line are schemes for the production of nitro-cellulose lacquers (production has since begun in Madras) synthetic finishes, titanium di-oxide pigments, and aluminium paste and powder pigment.

SOAP

Production of soap can easily be increased in India as we have large

oils and fats resources. Present consumption is over one lakh tons and is expected to reach two lakh tons by 1955-56. We are already exporting soap to the Middle East and the Far East.

TANNING AND FOOTWEAR

India is a well-known exporter of hides and skins, and the value of these exports was Rs. 8. 2 crores of raw hides and skins and Rs. 24. 9 crores of tanned hides and skins. India is already exporting over half-a million pairs of footwear and this is expected to be doubled by 1955-56.

PAPER AND PAPER-BOARD

In 1951, there were 17 units of which there were four in South India. Actual production in 1950-51 was 1,14,000 tons of paper and paper-board, and 22,000 tons of straw board, etc. This is expected to increase to 2,00,000 tons and 52,600 tons respectively in 1955-56. This is apart from the first newsprint factory, which is under erection in Madhya Pradesh, and which will produce 27,000 tons by 1955-56, as against 1,00,000 tons expected to be required by 1955-56. Self-sufficiency will be

reached with respect to other paper, and paper-board by 1955-56.

CEMENT

There are five factories in Madras State, and one each in Mysore and Travancore-Cochin. Consumption was of the order of 2.6 M. tons in recent years, and is expected to reach 4.5 M. tons by 1955-56. The entire requirements will be met by expansion of the existing plants and new plants. We are already exporting considerable quantities of cement, and by 1955-56, we should be exporting 3,00,000 tons.

GLASS

There are eight units in Madras, and one each in Travancore-Cochin and Mysore. Imports of glass-ware in 1951-52 amounted to Rs. 2. 14 crores. In 1950-51, bangles accounted for 16,000 tons of glass, and it is interesting to note that this demand is not expected to increase. Nearly half the sheet glass requirement of 52,200 tons and of blown-ware, pressed-ware, including glass shells for electric lamps, are expected to be made by 1955-56. It is also hoped to make nearly all our requirements of safety glass and optical glass.

Extract from Five-Year Plan:

Heavy chemicals, fertilisers

10. Considerable expansion of the capacity of the caustic soda industry in existence (the D. C. M. Chemical Works and the Mettur Chemical and cells was brought into production by the Travancore-Cochin Chemicals. New for superphosphate (additional capacity 34,100 tons), for sulphur drugs and respectively) have also been completed. Capacity for the production of 500 tons established.

Progress in the implementation of Industrial Development

INDUSTRIES	Unit	1951—56	
		Additional capacity	Additional production
<i>Fertilisers :</i>			
i. Ammonium sulphate	.. Tons '000	403	400
ii. Superphosphate	.. Tons '000	86	125
<i>Heavy Chemicals :</i>			
i. Sulphuric acid	.. Tons '000	70	101
ii. Soda ash	.. Tons '000	32	33
iii. Caustic Soda	.. Tons '000	18	22
<i>Drugs and Pharmaceuticals :</i>			
i. Benzene hexachloride	.. Tons '000	500	500
ii. Sulpha drugs	.. Lbs. '000	400	400
iii. Para-amino salicylic acid	.. Tons	48	48
<i>Paints and Varnishes :</i>			
i. Ready-mixed paints, varnishes, etc.	Tons '000	5	31
ii. Pigments (Titanium di-oxide)	.. Tons	1,800	1,800
iii. Nitro-cellulose lacquers	.. Gals. '000	500 (2)	450 (2)
iv. Aluminium paste and Powder	.. Tons	750	750
Soap	.. Tons '000	15	94
Tanning and Footwear (Footwear only)	.. Pairs Million	N. A.	6.0
<i>Paper and Paper Board :</i>			
i. Paper and Paper board	.. Tons '000	74	86
ii. Straw board and other boards	.. Tons '000	10	31
iii. Cement	.. Tons '000	2,026	2,108
<i>Glass and Glassware :</i>			
i. Sheet glass	.. Tons	40,500	20,150
ii. Blownware and pressed-ware	.. Tons	36,250	51,400
			to 56,400

* Estimated.

N. A. Not available.

(2) Targets have been provisionally revised in the light of recent development.

Progress Report for 1951-52 and 1952-53.

and pharmaceuticals.

has taken place under the stimulus of favourable prices. Two of the producers (Industrial Corporation) expended their capacity. A new unit operating mercury units for sulphuric acid, numbering seven, (additional total capacity 46,850 tons), sulphur black and azo dyes (annual capacity 7,81,840 lbs. and 2,839 million lbs. of benzene hexachloride per annum, an important insecticide, has also been

programmes in the Heavy chemical and Allied Industries field.

Progress during 1951—52		Actual production during April to December		Total capacity in 1952	Additional capacity required to achieve the Target
Additional capacity	Additional production	1951	1952		
350	28	40	185	432	49
50	4	46	31	198	11
39	3	80	74	192	29
..	2	36	33	54	32
4	4	11	13	35	2
500	70	..	70	500	..
..	..	..	80	350	50
N. A.	7	7	N. A.	N. A.	N. A.
..	4	25	24	65	5
1,800	198*	153*	178*	1,800	..
194	N. A.	69	82	403 (3)	..
500	87*	13	228*	500*	250
7	11	63	63	272	8
N. A.	0.56	4.3	3.7	N. A.	N. A.
6	21	101	104	148	63
N. A.	3	N. A.	N. A.	N. A.	N. A.
442	596	2,386	2,714	3,845	1,461
(-) 1,500	380	4,158	2,450	10,200	15,800
6,500	23,600	N. A.	N. A.	N. A.	N. A.

(3) The capacity of the new units is capable of being worked for an additional capacity about 97,000 gallons per annum.



T. V. Marimuthu.

In Memoriam

ON June 19, Mr. T. V. Marimuthu, Operator and Fitter, Cell house, known familiarly as Roberts, passed away after a brief and sudden illness. Intelligent and hard-working, he showed exceptional skill and aptitude in jobs like laying the diaphragms in the cells.

When Marimuthu mooted the suggestion of a benevolent fund for the families of employees dying in harness, the idea should hardly have crossed his mind that his family would be the first beneficiaries, but so it has been.

In his untimely demise, we have lost a very fine worker, a friend and a comrade, and through the columns of this Journal, we extend to the members of his family, our most sincere sympathy.

Miscellany

Society of Technologists: A symposium on the "Production, Refining and utilization of vegetable oils" was conducted on May 20 and May 23, 1953.

Inaugurating the symposium, Mr. S. Ramaswamy, President of the Society, referred to India's high place in the world production of oilseeds and oils and the inadequacy of her production even to meet the internal *per capita* requirement. He suggested some steps that might usefully be taken for increasing the *per capita* availability of oils and fats, and referred also to the developments envisaged in this direction in the First Five-Year Plan.

The following papers were presented at the symposium:

Name of author	Title
C. S. Srinivasan	The formation and composition of vegetable oils and fats and methods of refining.

T. S. Subba Rao	Decolourisation of vegetable oils.	industries, for food preservation, and for several other minor applications like the preparation of pre-cooled concrete.
T. Subbaratnam	Hydrogenation of vegetable oils and fats.	He answered a number of questions, chiefly on fresh and sealed-type compressors.
T. S. Subba Rao	Deodorization of Vegetable oils.	Mr. R. S. Iyer, then, gave a brief talk on "The Mechanisation of Agriculture".
C. S. Srinivasan	Utilization of vegetable oils and fats for edible and industrial purposes.	With the concluding remarks of Mr. Ramaswamy, President, and a vote of thanks proposed by Mr. C. S. Srinivasan, this little function came to a close.
S. Ramamurthy.	The use of vegetable oils and fats in soap-making.	

There was a lively and interesting discussion after each paper.

On July 28, Mr. K. V. Subramanian, Senior Chemist, presented a paper on "Chemical Fertilisers". The portion relating to "Superphosphates" is reproduced elsewhere in this issue.

Mr. M. P. Koshy of the Punalur Paper Mills read a paper on "Pulp and Paper Manufacture" on Aug. 6. He dealt with all aspects of pulp and paper making, and answered a number of questions that were put to him by members.

On August 15, the Society met at tea a group of engineers from Volkart Brothers, Madras. Mr. K.A. Parthasarathy spoke on "Air-conditioning"—for comfort, in textile and other

Staff Association: Mr. Tiruloka Sitaram, Editor, *Shivaji*, and Srimathi Thangamma Bharathi visited us on July 5. Mr. Sitaram addressed the Staff Association on "Poetical heirs to Bharathi". In the course of his interesting talk, Mr. Sitaram dealt with several contemporary poets, quoting profusely from their works.

Distinguished Visitors: Mr. T. N. Lakshminarayanan, Collector of Salem and Mrs. Lakshminarayanan, visited our works on Aug. 11. They were shown round our works by Mr. R. Natarajan, Secretary.

On August 3-5, we had with us Mr. A. R. Narasimhan, a former member of MCIC, and now the Production

Chief of the Travancore-Cochin Chemicals, Limited, Alwaye.

A small group of engineers from Volkarts, Madras were our guests on August 15-16. The party consisted of Mr. T. S. Sivaramakrishnan, Mr. V. Doraiswamy and Mr. M. Madhava Rao of the Mechanical Group, Mr. A. Gopalakrishnan and Mr. V. S. N. Nayak of the Electrical group, Mr. K. G. Thomas, Mr. K. A. Parthasarathy and Mr. S. Ramachandran of the Refrigeration Division, Mr. C. E. Gupta of the Textile Division and Mr. R.S. Iyer of the Agricultural Textile Division. As mentioned already, the Society of Technologists met them at tea.



The "Volkart" group who were with us on August 15-16

Mr. A.R. Narasimham addressed our executives on August 5

New Secondary School: On July 9, Mr. P. V. Venkatavaradan, District Educational Officer, Salem, declared the 'Mettur Chemicals Secondary School open the sixth, seventh and eighth standards of the Higher Elementary section being changed into Forms I, II and III.

Mr. R. Natarajan, who presided, welcomed the gathering of parents, teachers and pupils. Mr. N. Rajagopal, Correspondent of the School, read a report, tracing the history of the school and the progress achieved by it from time to time.

After completing the necessary formalities connected with the inauguration of the Secondary school, Mr. P.V. Venkatavaradan addressed the gathering on the merits of the new scheme of elementary education. He said that as the purpose of education was to draw out the talents latent in children, three hours of instruction at school every day was ample. The scheme also afforded an opportunity to children to learn the vocation of parents where possible or other crafts from local craftsmen.

Referring to the conversion of the Higher Elementary Section of the

School into a Secondary School, Mr. Venkatavaradan said that it was an achievement—viewed particularly in the context of the time that had elapsed after reopening. A great part of the credit, he said, rightly belonged to Mr. N. Rajagopal, Correspondent of the School.

Speaking on behalf of parents, Mr. T.S. Subba Rao, Chemist, congratulated Mr. N. Rajagopal and all those who had helped him in raising the status of the School, and appealed to the school staff to give of their best to the children.

With the singing of the National Anthem by Mr. D. W. James, the function came to a close.

Weddings: Mr. S. Panchapakesa Iyer, Accountant, celebrated the marriage of his daughter Miss Paruvatham with Mr. V. Natarajan on June 8.

Mr. S. Ramamurthi, Electrical Engineer, celebrated the Upanayanam of his sons R. Prasanna Venkateswaran and R. Srinivasan at Swamimalai on May, 15.

Mr. R. S. Subramaniam, Operator, celebrated the marriage of his daughter Miss Lakshmi with Mr. G.A. Muthukrishnan on July 3.

Our congratulations and good wishes go to all concerned.

Pictures: Films shown in recent months included: *Macbeth*; *Three Men in White*; *Big Ship*; *Marx Brothers at the Circus*; *Sea of Grass*; *The Flame and the Arrow*; *China Seas*; *Happy Years*; *Casablanca*; *Junior Chambers of Commerce*; (USIS) *Lifting*; (BIS) *Perspex and Rubber Laboratories*; (ICI) and *Diesel, the Modern Power*.



Mr. T. N. Lakshminarayanan (second from left) and Mrs. Lakshminarayanan.

SPORTS *Notings*

Cricket: On June 26, at one of the quietest meetings on record—not that they are ever too stormy—the members of the Cricket Club elected the following office-bearers:

P. B. Srirangan —Captain.
K. Sampath —Vice Captain.
T. G. Raghavan —Nets Secretary.
R. Natarajan } Additional Mem-
K. Ganesh } bers of the Selec-
tion Committee.

The first big match of the season was played on our grounds on August 16. In what might without much exaggeration be described as a sensational finish, the Sourashtra Cricket Club defeated us by three wickets.

Winning the toss and electing to bat, we ran up a good (or, so it looked, then,) total of 149. N. Narayanan knocked off a bright 54, and was ably sustained in his stand by N. Kalyanam (27).

M. V. V. Pathy bagged 4 for 23 and N. Sundararajan 2 for 14.

When the visitors started batting, wickets fell rapidly, and with only 30 minutes or so left for play, and five wickets on hand, our hopes naturally soared sky-high. In any case, even if victory should elude us, a draw was indicated, but, alas, the result was neither. S. Bashyam (58 N. O.) and

P. V. Rangachari (29 N. O.) mercilessly punished our bowlers.

Receiving a blow near the ear, Bashyam had to retire for a while, and when he returned to the crease, he played like one inspired.

The last 30 runs came in 10 minutes. Bashyam's play was such a heroic display that even the ranks of Tuscany could scarce forbear to cheer.



S. Bashyam and N. Narayanan.

Pathy contributed a useful 31.

K. Ganesh and N. Narayanan took 2 for 25 and 2 for 5 respectively.

Practice Matches

T. D. K. Sami's XI (133) beat K. Sampath's XI (119) on July 4.

N. Kalyanam 59, T. Antony 25, N. Narayana Rao 3 for 21, Suri 2 for 11, V. Muthuswamy 2 for 0.

P. R. Subba Rao 24, K. R. V. Ramani 21, N. Kalyanam 3 for 11, V. Antony 3 for 12, M. S. Ramaswami 2 for 6.

S. Ramaswamy's XII (156) beat N. Kalyanam's XII (140) on July 12.

N. Narayana Rao 71, K. Ganesh 40, T. D. K. Sami 4 for 40, M. S. Ramaswami 2 for 13.

K. R. Ramakrishnan 52, R. G. Raghavan 5 for 22, K. Ganesh 3 for 18, Raju 2 for 18.

S. Ramaswamy's XI (137) beat K. Sampath's XI (126) on July 19.

N. Narayana Rao 75 N. O. N. Kalyanam 20, K. Sampath 3 for 36, T. Antony 2 for 37.

K. R. Ramakrishnan 64, N. O., N. Narayana Rao 3 for 37, S. Ramaswamy 2 for 20.)

K. Sampath's XI (171) drew with P. B. Srirangan's XI (132 for 9), on August 9.

R. G. Raghavan 43, M. S. Ramaswamy 27 N. O., S. Ramaswamy 23, K. Ganesh 20, N. Kalyanam 2 for 23, P. B. Srirangan 2 for 33.

K. R. Ramakrishnan 38, N. Narayana Rao 29, R. Narayanaswamy 23, R. G. Raghavan 2 for 48.

Badminton: Our team avenged their previous defeat at the hands of the Government Fisheries Department, Mettur Dam, in a friendly match played on our grounds on April 26. Strictly speaking this victory should have been reported in the last issue of METKEM, but if we had done so, we would have divested the pisciculturists of the halo of their first success. Not to be out-done in courtesies, we stood them and by-standers drinks and coffee. (See last issue of METKEM.)

This match apart, there is nothing much to report, and the badminton court looks now-a-days so barren and devoid of players that if a modern Goldsmith sought inspiration for writing a poem like *The Deserted Village*, he could do worse than camp around here.

Table Tennis: We lost all the five singles matches that we played against the Mettur Recreation Club in June. Even the hard-hitting Rao (from Banaras Hindu University) who played on our side, could not pierce through the stubborn defence put up by Balu of M. R. C.

Volleyball: We sent out two teams to participate in the Mettur Town Sports Club Triples Tournament staged at Mettur Dam, in the middle of May.

Our 'A' Team (T. A. Javanthina-
than, S. Muniyappan and A. P. S. Mani) lost to Mettur Town Team 'C' by one game to two in the first round. But our 'B' Team (N. Venkatachalam, K. Rethinam and G. G. Venkatraman) fared better by clearing their way up to semi-finals. They beat the Hospital Team by two games to nil in the first round and beat the Town Team 'D' in the next round by two games to one, but went down tamely before the strong Church Team 'B', Salem Camp, in two straight games, in the semi-finals.

The finals between the Town Team and the Church Team 'B' was a battle of wits and muscle-power. Our own play looked in retrospect y much like child's play.

Portrait Gallery

Whole School promoted: Once upon a time—actually, not very long ago—there was ‘beside yon straggling fence’, a Lower Elementary School in Mettur. In 1950, it had a “promotion”—it became a Higher Elementary School. Some months ago, this year, it had yet another “promotion”, and it became a Middle School.

And one of these fine days, it is going to be a High School—and possibly, who knows—even a College. For the Middle School of to-day and the College of to-morrow, Mettur parents vastly owe to N. Rajagopal,



N. Rajagopal.

one of our chemists, and the Correspondent of the School.

Rajagopal took his B. Sc. degree in 1932, and was for a period of five years engaged in “scientific farming”—that is, he brought to bear all his knowledge of science on his land.

In 1937, he passed creditably the City and Guilds (London) Institute examinations in Electrical Engineering.

Rajagopal joined the South Madras Electric Supply Corporation, Limited, as an Assistant in Tiruvarur, in 1938. He was attached to the Mettur Department.

In 1941, he came to Mettur and has served, among other departments, in the Brine Room, Erection and Maintenance, and the Electrolysis Plant.

He is at present in charge of the Lime Calcining and Slaking Sections, and it is common knowledge that he is handling his portfolio with great skill.

Rajagopal is a speed merchant. Whether it is taking down notes or making up a report or drafting a memorandum, Rajagopal can tackle all in a mere matter of minutes.

Not many at Mettur know, that while at College, Rajagopal used to copy out scientific books and technical tomes, not readily available, word for word, line by line, and page by page—not omitting the charts and diagrams.

Among Rajagopal's hobbies are gardening and collection of minerals. It may be mentioned in this connection that when Sir C. V. Raman visited our works in 1947, Rajagopal presented him with a collection of small crystals of calcite. Commented the Nobel Laureate: “Your collection provides the subject matter for a vast range of research on the structure of calcite crystals”.

Rajagopal devotes all his spare time to the cause of the school and the education of the children of the colony. To adopt the slogan of an associate cable making company—he “takes the load” right off the hands of many distracted Mettur parents.

Good Morning, Mr. Chips: While still on the subject of the School, we would like to present to you its new Headmaster, Mr. A. Srinivasaraghavan, B. A., L. T. Mr. Srinivasaraghavan brings to his current assignment the accumulated experience of twenty-five years of teaching and administration. Until recently, he was the Headmaster of the Kassimiah High School, Tanjore. His genial disposition has already endeared him to staff and students and parents alike, and we look forward to his continued presence with us for some generations to come.

Efficiency Expert: If a school needs a head, so does the office of a works.

There are so many departments in a modern office, like correspondence, records, stationery—aye, there is the rub—and so on, that unless work in these various departments is properly co-ordinated, an industrial unit cannot function at all. In charge of such co-ordination, (among several undefined tasks) is V. Srinivasan. Srinivasan's genius shows itself particularly in the issue, rather, the non-issue, of stationery. Although his conception of the Stationery Department is not precisely that of the average army Equipment Officer's conception of a clothing store—which is, we have on very good authority, something between a bank strong-room, a collection of heirlooms and two bucketfuls of the Officer's own heart's blood—



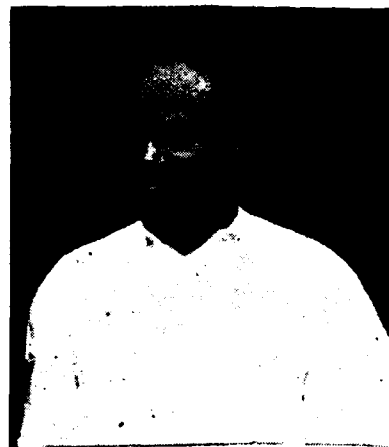
V. Srinivasan.

Srinivasan will, now and again, make sure that you *do* need a pin when you requisition one.

Serious without being fussy and sincere without being affected, it is little wonder that he is extremely popular with all sections of staff in Mettur.

Recently, we gave tangible proof of our esteem for him by making him the Trustee of the local Vinayagar temple. And we are sure that he would run the affairs of the temple as smoothly and as efficiently as he has been running our office.

Books, Badminton & Bridge: Another personality whom it would pay you to know is Mr. T. M. Krishna Rao, Cost Accountant. A veteran in the accountancy field, Mr. Rao's experience extends over a period of twenty years. As one who joined MCIC as early as 1936, when the Company was being formed by Messrs. Dayaram and Sons, the former managing agency



T. M. Krishna Rao

firm, Rao has had much to contribute to MCIC's progress.

Modest and un-assuming and most helpful and constructive in his suggestions, one is always the richer for a talk with Rao.

Rao is good at Badminton, and even better, at Bridge.

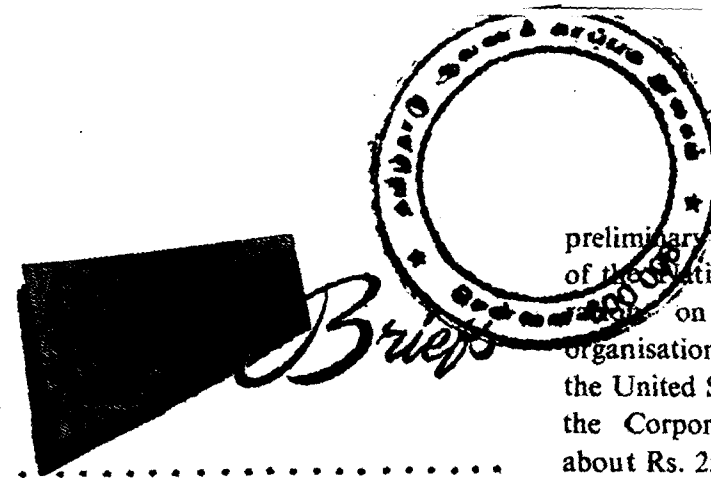
The-best-is-yet-to-be Department: Another friend to whom we would like you to give a warm hand-shake is C. Govindaswamy, operator. A severe critic of himself, nothing but the very



C. Govindaswamy.

best he can offer satisfies him. He joined MCIC in 1943, and he has worked in the various sections of the alkali side of the factory. He is a member of the Provident Fund Committee and the Executive Committee of the Union.

Govindaswamy's favourite game is volleyball.



preliminary work on the establishment of the National Development Corporation on the lines of similar organisations in Britain, Canada and the United States. The initial cost of the Corporation is expected to be about Rs. 25 lakhs.

The Corporation will arrange for installing pilot plants or full commercial units for demonstrating the practicability of the inventions of Research Laboratories and the economic possibilities of these inventions. The facilities which the Corporation will offer will be available to research institutions, universities and industry.

1. Development Council for Heavy Chemicals: The Development Council for the industries engaged in the manufacture of heavy chemicals, recently formed by the Government of India, recently held its first meeting on July 10. Mr. T. T. Krishnamachari inaugurated the meeting. The Council would deal with the expansion of particular units—their efficiency, their utilisation of existing capacities, modernisation of plants where necessary and the development of the industry as a whole. It was decided at this meeting to collect basic information in regard to heavy chemical industries.

It is understood that the council also discussed the present state of the acid and fertiliser industry, the question of undertaking a survey of the rated capacity of important chemicals and fertilisers.

2. National Development Corporation: A committee of seven members has been appointed by the Government of India to undertake

3. Involuntary unemployment in Industry: At a meeting of the standing Labour Committee held in New Delhi recently, a 14-point formula to give compensation to works for involuntary unemployment was agreed upon. On the appeal made by the Labour Minister, Sri V. V. Giri, representatives of employers and employees discussed the question, and agreed on a scheme of providing compensation to workers. The scheme will be considered by the Government of India, and when approved, legislation will be introduced to give effect to it.

4. Water Disinfectant: Commercial production has first begun in the United States of a water disinfectant called "MOVIDYN". It is said to

have outstanding germicidal properties. It is a colloidal suspension of metallic silver in a protective medium. The action is based on the oligo-dynamic action of heavy metals.

It is reported that treatment of water with one part per million of "MOVIDYN", will kill bacteria in a very short time. Further it will prevent growth of algae fungus and mold. It is claimed that "MOVIDYN" has certain advantages over even chlorine as a disinfectant.

5. Use of Lignite in Iron and Steel Industry: Investigations carried out under the auspices of the Lignite Investigation and Development Department of the Government of Madras have shown that lignite can be utilised in the direct reduction processes in the iron and steel industry.

High grade caking coal is largely used in the manufacture of iron and steel. This quality of coal is found mostly in Bihar, but iron ores which could be exploited for iron and steel production, are found widely distributed in India.

U. S. Chemical Output has quadrupled since 1939. The United States chemical industry has quadrupled its volume since 1939, according to a "facts book" published by the Manufacturing Chemists' Association, and its sales in 1952 reached an estimated \$ 18,660,000,000.

Almost every industrial chemical has been in such demand since the end of World War II, that chemical manufacturers have spent more than \$ 8,000,000,000 for new plants and equipment—about 11 percent of all industrial expansion.

"Nowhere has the leverage of modern technology been brought to bear more effectively than in the chemical industry," William H. Mard, Chairman of the Association, says in a foreward to the 100-page book.

"Technology has been the great revolutionary of our times. In a few generations it has exercised more profound influence on social custom and social reform than legislation or codes of law could effect in centuries."

Reviews

ADSORPTION: By C. L. Mantell, Ph. D., McGraw-Hill Book Company, inc., New York (Second Edition 1951).

ADSORPTION has now developed into a unit operation with its own characteristic laws and principles. In this volume, an attempt has been made to present in a comprehensive manner all the available information on the subject. The author discusses, in detail, some of the processes of adsorption like drying of gases, bleaching of oils, sugar refining, elimination of toxic gases, etc., all of which find wide application in industry.

The various theories of adsorption get only briefly noticed, possibly because this book is devoted in the main to the practical aspects of adsorption like the performance and design of units, pressure drops, bed depths, etc.

A mixture of gases or liquids can be resolved by adsorption. This technique which is a recent and important development is dealt with in the chapters *Fractionation of Liquid Hydrocarbons* and *Fractionation of Gases*. The properties and behaviour of some of the common adsorbents like alumina, silica, Fuller's earth, bone char are all presented in separate chapters with suitable diagrams and flow sheets. The subject of chromatographic adsorption is presented only in outline. Important tests that are normally

performed on various adsorbents are given in a separate chapter. However, a surprising omission, in this chapter, is a consideration of the method of determination of the surface area of the adsorbents. Nevertheless, the volume meets a real need for correlated information in a rapidly growing field. Both the operational man and the designing engineer will find the book most useful.

N. KALYANAM.

* * * *

VIMANA SAMACHAR: Published by the Hindustan Aircraft, Limited, Bangalore.

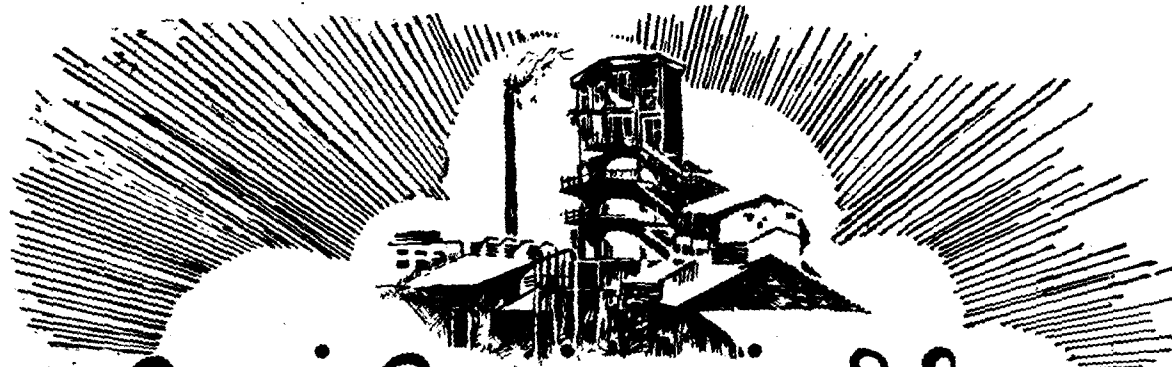
A house magazine which offers a rich and varied fare and which reaches quite a high standard of production is VIMANA SAMACHAR. The number under review (Volume V. No. 2) leads off with an interesting and informative article on the Company by Mr. H. M. Patel, I. C. S., Secretary, Ministry of Defence, and Chairman of the Board.

Other articles of interest to outside groups are: Shell Moulding by Mr. Bhasker Rao, Profit and Loss by Mr. L. Ramachandra Rao and a near-autobiographical piece of a railway coach by Mr. A. Mitra.

And then, of course, there are the usual items of a staff magazine—personnel notes, sports jottings and photographs.

Altogether, a commendable piece of journalistic job—this VIMANA SAMACHAR.

—R. P.



மெட்கெம்பத்திரிகை.

என்னைக் கேட்டால் ...?

கேமிஸ்ட்

என்னைப்பற்றி சில வார்த்தைகள் பேச வேண்டுமா? சரி ஏதோ சுருக்கமாகத் தான் சொல்லமுடியும்.

எங்கள் தொழிற்சாலையில் கெமிஸ்டுகள் செய்யும் வேலை மிகவும் முக்கியத்துவம் வாய்ந்தது. ரசாயனப் பொருள்களின் உற்பத்தியிலே முக்கிய பொறுப்பு ரசாயனிகளுக்குத்தானே? இப்பொருள்களின் உற்பத்தி அளவு, தரம் இவை இரண்டிலும் அதிக கவனம் செலுத்த வேண்டிய பொறுப்பு எங்களைச் சார்ந்தது.

மூலப் பொருள்களிலிருந்து உருவாகும் ரசாயனப் பொருள்கள் ஆரம்பத்திலிருந்து இறுதிவரை பல இடங்களில் ரசாயனச் சோதனைகளுக்கு உட்படுகின்றன. இந்த சோதனைகள்தான் எங்களுக்கு ஏற்பட்ட முக்கிய வேலை. இவற்றிலிருந்து கிடைக்கும் முடிவுகளை ஒட்டியே உற்பத்தி முறையையும், தரத்தையும் சரியாக கவனிக்கமுடியும். ஆகவே, அனுபவத்தின்மேல் வகுக்கப்பட்டிருக்கும் ஒரு பரிசீலனைத் திட்டத்தைப்

பின்பற்றி நாங்கள் உற்பத்தி முறையை சீராக நடத்திவருகிறோம்.

சரியாக உற்பத்திசெய்ய, தொழிற்சாலை யிலுள்ள பலவித யந்திரங்களும், சாதனங்களும் எவ்வித தடங்கலுமில்லாமல் இயங்குவது மிக அவசியம். இவற்றை மேற்பார்வை பார்த்து, பழுது, கோளாறு இல்லாமல் அவைகள் வேலைசெய்ய, எங்கள் கீழே ஆப்ப ரேட்டர், அட்டெண்டர், ஹெல்பர் வேலை செய்கிறார்கள். இவர்களில் பலர் தங்கள் செக்ஷன்களில் நீண்ட அனுபவ முள்ளவர்களாதலால் இவர்கள் எங்களுடன் உற்பத்தித்துறையில் நன்கு ஒத்துழைக்கிறார்கள்.

மேலும் உடனடியாக ஏற்படும் கோளாறுகளைக் கவனிக்க நியமிக்கப்பட்டிருக்கும் மெயின்டனென்ஸ் செக்ஷனிலுள்ள இன்ஜினியர்கள், பிட்டர்கள் முதலியவர்களும் எங்களுக்கு சகாயமாக இருந்து பெரிதும் உதவுகிறார்கள்.

நாங்களெல்லோரும் பிரதம உற்பத்தி அதிகாரி தலைமையின்கீழ் வேலை செய்கிறோம். செயல் முறைகளில் மாறுதல்கள், சீர்திருத்தங்கள், எல்லாவற்றையும் ஆராய்ந்து, வேண்டிய உத்தரவுகளைப் போடுகிறார் அவர். அவற்றை நிறைவேற்று முன், அவரோடு கலந்து விவாதித்துப் பேச, எங்களுக்கு அடிக்கடி சந்தர்ப்பம் கொடுக்கிறார். சந்தேகம், நெருக்கடி ஏற்படும் சமயங்களில் அவருடைய ஆலோசனையையும் உதவியையும், தாமதமின்றி நாங்கள் நாடுகிறோம்.

“ஜாப் இன்ஸ்ட்ரக்ஷன் ட்ரெயினிங்” எனப்படும் தொழில் பயிற்சி யளிக்கும் முறைகளில் எங்களுக்கு தேர்ச்சி அளிக்கப் பட்டிருக்கிறது. ஒரு தொழிலாளி ஒரு குறிப்பிட்ட காரியத்தை திறம்பட எப்படி செய்யவேண்டுமென்ற பயிற்சி அளிப்பதே இத்திட்டத்தின் நோக்கம்.

தொழிற்சாலைக்கு வெளியே எடுத்துக் கொண்டாலும், நாங்கள் பல நடவடிக்கைகளில் பங்கெடுத்துக் கொள்கிறோம். எங்கள் கோஷ்டியிலே எழுத்தாளர்கள், பேச்சாளர்கள், வேதசாஸ்திரம் படித்தவர்கள், நாஸ்திகம் தோன்றப்பேசும் நாகரிக நண்பர்கள், பழமைப் பித்தர்கள், ரேடியோ சங்கீத வித்வான்கள், நடிகர்கள் எல்லோரும் இருக்கிறார்கள்! விளையாட்டுக்களை எடுத்துக்கொண்டாலோ அவை ஒவ்வொன்றிலும் கெமிஸ்ட் கட்சி என்றே ஒரு சிறந்த கட்சி அமைக்கும்படியான அளவுக்கு, எங்களிடையே ஆட்டாக்காரர்கள் இருக்கிறார்கள்.

எங்களுடைய சிரமமான அலுவல்கள் எங்களிடமுள்ள ஹாஸ்ய உணர்ச்சியை ஒருபோதும் மங்கச் செய்வதில்லை. ஒரு மேல்நாட்டுத் தொழில் நிபுணர் எங்கள் தொழிற்சாலைக்கு விஜயம் செய்தபொழுது எங்களில் ஒருவர் அவரை தொழிற்சாலை

யைச் சுற்றிக் காண்பித்துக் கொண்டிருந்தார். (இதுவும் எங்களுக்கு சில சமயங்களில் வரும் வேலைகளில் ஒன்று!) ‘திடீரென்று நிபுணர் கெமிஸ்டைப் பார்த்து’ “ஆமாம், சோடா ஆஷ் (நாங்கள் உபயோகிக்கும் ஒரு ரசாயனப் பொருள்) உங்களுக்கு எங்கிருந்து கிடைக்கிறது” என்று



ஆவலாகக் கேட்டார். எங்கள் கெமிஸ்ட் நண்பர் ஒரு விநாடிகூட தயங்காமல் “அதுவா, எங்கள் தொழிற்சாலை ஸ்டோரி லிருந்து கிடைக்கிறது!” என்று பதிலளித்தார்.

ஏதோ இப்படி நினைவுக்கு வந்ததை யெல்லாம் சொல்லிவந்துவிட்டேன். நேரமாகி விட்டது; போகவேண்டும். போய் வருகிறேன், நமஸ்காரம்.

—T. S. SUBBA RAO.

மெட்கெம் செய்திகள்

மேட்டூர் கெமிகல்ஸ் செகண்டரி பாடசாலை திறப்பு விழா

சென்ற ஜூலை 9-ந் தேதி மேட்டூர் கெமிகல்ஸ் செகண்டரி பாடசாலை திறப்பு விழா கெமிகல்ஸ் பாடசாலைக் கட்டிடத்தில் நடைபெற்றது. முன்னர் நடைபெற்று வந்த உயர்தர ஆரம்ப வகுப்புகள்

காலத்தில் சிறந்த தேசப் பிரஜைகளாக கல்வி அவசியம் எனவும், மேட்டூரில் உயர்தரக் கல்வி கற்க பிள்ளைகளுக்கு இருந்த பல துன்பங்களையும், அவற்றை நீக்க கெமிகல் மானேஜ்மெண்டார் இங்கு ஒரு நடுத்தர



பள்ளி
சுதந்திரதின
விழாவில் தலைவர்
ஸ்ரீ R. நடராஜன்
தலைமை உரை
நிகழ்த்துகிறார்.
பக்கத்தில்
இருப்பவர்கள்
கரஸ்பாண்டென்ட்
ஸ்ரீ N. ராஜகோபால்,
புதிய தலைமை
ஆசிரியர் ஸ்ரீ
A. சீனிவாசராகவன்

I, II, III படிவங்களாக மாற்றப்பட்டன. பெற்றோர்களும், தாய்மார்களும், மாணவ மாணவிகளும் பெருமளவில் வந்து விழாவை சிறப்பித்தனர்.

விழாவிற்கு தலைமை வகித்த பாடசாலைக் கமிட்டித் தலைவர் ஸ்ரீ R. நடராஜன் அவர்கள் தமது உரையில், குழந்தைகள் வருங்

பாடசாலை துவங்க வந்திகள் அளித்ததைப் பாராட்டியும் பேசினார்.

பின்னர் பாடசாலைகளின் கமிட்டி காரிய தரிசியும், கரஸ்பாண்டெண்டுமான ஸ்ரீ N. ராஜகோபால் அவர்கள் தமது அறிக்கையில் எடுத்துக்காட்டியதாவது: 1942ம் ஆண்டில் பிப்ரவரி 1ம் தேதி ஒரு சிறு ஆரம்பப்

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பாடசாலையாகத் துவங்கி, இப்பொழுது சுமார் 600 பிள்ளைகளைக் கொண்ட நடுத்தர பாடசாலையாக இது வளர்ச்சி பெற்றிருக்கிறது. நடுத்தர, உயர்தரப் பாடசாலைகள் நடத்த அநேகம் தேவைகள் உள். அதற்கு பெற்றோர்களின் ஒத்துழைப்பு மிகவும் அவசியம். தேவையான ஒத்துழைப்பை அவர்கள் அளிக்கவேண்டும். இப்பாடசாலை துவங்க கெமிகல்ஸ் மானேஜ்மெண்டாரும், கல்வி இலாகா அதிகாரிகளும் குறிப்பாக சேலம் ஜில்லா கல்வி அதிகாரி அவர்களும் பேருதவிகளை அளித்திருக்கின்றனர்.

அதன்பின்னர் சேலம் ஜில்லா கல்வி அதிகாரி ஸ்ரீ P. V. வெங்கட வரதன் அவர்கள்

ஒன்று, ஆசிரியர்கள் பலர் வேலையினின்றும் நீக்கப்படுவார்கள் என்பது. இம்மாதிரி வேலை நீக்கம் இல்லை என்று இப்போது தெளிவாகிவிட்டது. இரண்டாவது, பாடசாலை வேலை நேரம் குறைவதால் பிள்ளைகளின் கல்வித்தரம் குறையும் என்பது. இத்தகைய சந்தேகம் தேவை இல்லை. சிறு பிள்ளைகளுக்கு மூன்று மணி நேரத்துக்கு மேல் போதனை அவசியமில்லை. பிள்ளைகளுக்கு பாடசாலையினின்றும் அரை நாள் விடுதலை அளிப்பதால் அவர்களுக்கு தொழில் பற்றுதல் ஏற்படவும் வசதியுண்டு.

பாடசாலையில் இடவசதி இன்மை குறையும்



சுதந்திரதின
கொடியேற்றுவிழா.

கெமிகல்ஸ் செகண்டரி பள்ளியை துவக்கி வைத்து, பின்னர் ஒரு சொற்பொழிவு நிகழ்த்தினார். அவர் கூறியதாவது: அமுலுக்கு வந்துள்ள புதுச்சேலித் திட்டம் மேட்டூர் அனை பிரதேசத்திற்கும் அமுலாகும். இத்திட்டத்தை சிலர் தவறாக எதிர்ப்பதற்கு இரு சந்தேகங்கள் சார்பாகும்.

நீங்கும். பெற்றோர்களுக்கும் பிள்ளைகள் மேல் உள்ள பொறுப்பு அபிவிருத்தி அடையும். எத்தகைய திட்டமாயினும் முதலில் ஆசிரியர்கள் இருக்கத்தான் செய்யும். ஆனால், அனுபவத்தினால் திட்டத்தின் நன்மைகள் தெளிவாகும்போது ஆசிரியர்கள் தானாகவே மறையும்.

பெற்றோர்கள் சார்பாக ஸ்ரீ T. S. சுப்பராவ் பள்ளி நிர்வாகிகளையும் முக்கியமாக ஸ்ரீ N. ராஜகோபால் அவர்களையும் இந்த சாதனை அடைந்ததுபற்றி பாராட்டிப் பேசினார். ஆசிரியர்கள் இன்னும் அதிக ஊக்கத்துடன் உழைத்து சிறுவர்களை நாட்டிற்குச் சிறந்த பிரஜைகளாக ஆக்குமாறு வேண்டினார். பெற்றோர்களுக்கும் இந்த விஷயத்தில் பொறுப்பு உண்டு என்று அவர் கூறினார். ஆசிரியர் ஸ்ரீ D. W. ஜேம்ஸ் 'ஜனகணமன' பாடியபின், கூட்டம் இனிதே முடிந்தது.



அக்னிஹோத்ரம், பிரஹ்மஸ்ரீ ராமானுஜ தாத்தாச்சாரியார்

இந் நடுத்தரப் பாடசாலை துவங்க, பாடசாலையின் கரஸ்பாண்டெண்ட், ஸ்ரீ N. ராஜகோபால் அவர்களின் இடையறு உழைப்பும் ஊக்கமுடைய முக்கிய காரணங்களாகும். அவர் தமது உத்தியோக அலுவல்களுக்கிடையேயும் பாடசாலைக் கமிட்டியின் செயலையும் காரியதரிசியாக இருந்து, தமது ஓய்வுநேரங்

களில் பெரும் பகுதியை பாடசாலையின் பொருட்டு செலவிட்டு, அல்லும் பகலும் உழைத்துவருவது மிக பாராட்டுதற்குரியது.

பள்ளியில் சுதந்திர தின விழா

மேட்டூர் கெமிகல் நடுத்தர ஆரம்பப் பாடசாலைகள் கூட்டாக ஆகஸ்டு 15ம் தேதி 'சுதந்திரதின விழா' வைக்கொண்டாடின.

அன்று காலை, 7-45 மணிக்கு இரு பர்ட் சாலைகளின் மாணவ, மாணவிகளும் கொடி மரத்தின் கீழ் அணிவகுத்து நின்றனர். பாடசாலைக் கமிட்டியின் தலைவரும், மேட்டூர் கெமிகல்ஸின் காரியதரிசியுமான ஸ்ரீ R. நடராஜன் அவர்கள் தேசியக்கொடியை பறக்கவிட்டார். மாணவிகளால் கொடி வாழ்த்து பாடல் இசைக்கப்பெற்றது.

பின்னர், ஸ்ரீ R. நடராஜன் அவர்கள் இந்த சுதந்திரதினத்துக்கு வருங்காலத்தில் தேச முன்னேற்றத்தில் பங்குகொள்ள பல வாய்ப்புகள் உள்ளன. அதற்கு இப்பொழுதே பாடங்களில் நல்ல கவனம் செலுத்தி, தங்களைத் தயாராக்கிக் கொள்ளவேண்டும் என மொழிந்தார்.

பின்னர், தலைமை ஆசிரியர், ஸ்ரீ A. சீனி வாசராகவன் அவர்கள் பேசினார். நமது நாடு உலகம் கண்டிராத அஹிம்சா முறையில் சுதந்திரம் அடைந்தது. இந்நாட்டில் நமது சுதந்திரத்திற்காக உழைத்து பல துன்பங்களையும் அனுபவித்த நமது தேசபக்தர்களுக்கு அஞ்சலி செய்யவேண்டும். வருங்காலத்தில் நம் நாடு பல துறைகளிலும் முன்னேற்றம் அடைவதற்கான அறிவு குறிகள் உள. மாணவ மாணவிகள் வருங்கால சீரிய பிரஜைகளாக தங்களைத் தயார் செய்துகொள்ளவேண்டும் எனவும் எடுத்துரைத்தார்.

தேசிய கீதம் பாடப்பட்ட பின்னர் குழந்தைகளுக்கு தின்பண்டம் அளிக்கப்பட்டு, விழா முடிவுற்றது.

—M. V. சுப்ரமணியம்,

எல்லாவிதமான கலர் அச்ச வேலைகளுக்கும்

ஆங்கிலம், தமிழ், தெலுங்கு,
மலையாளம், சம்ஸ்கிருதம்.
ஹிந்தி, நாகரம் முதலிய
புத்தக வேலை
களுக்கும்
குறிப்பு, பேரேடு
முதலிய
கணக்கு புத்தக
பைண்டு வேலைகளுக்கும்

சிறந்த அச்சகம்



திருச்சிபுப்பள்ளி
யுனிடெட் பிரிண்டர்ஸ் லிமிடெட்
தெப்பக்குளம், திருச்சிராப்பள்ளி.

போன் : 226

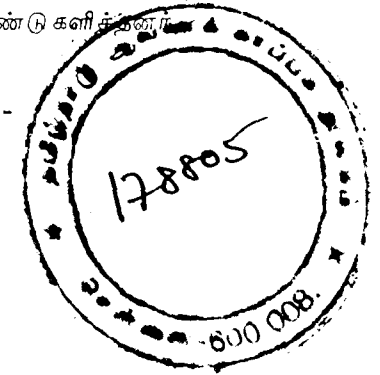
பஜனை சமரம்: ஜூலை மாதம் 13ம் தேதி, பெங்களூர் ஸ்ரீ கிருஷ்ண பாகவதர் அவர்களால் ஒரு சிறந்த காலக்ஷேபம் நடத்தப்பெற்றது.

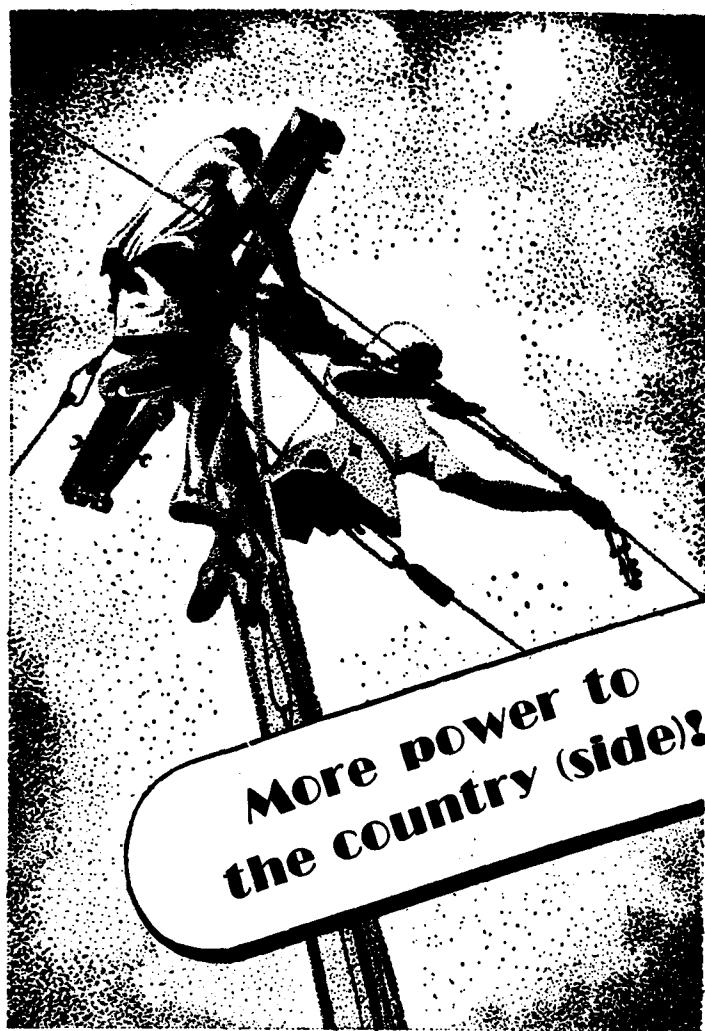
ஆகஸ்ட் 7ம் தேதி முதல் 18ம் தேதி வரை கும்பகோணம் அக்னிஹோத்ரம், பிரஹ்மஸ்ரீ ராமானுஜ தாத்தாச்சாரியார் அவர்களால் பாகவதம், ராமாயணம் பற்றிய உபன்யாசங்கள் நிகழ்த்தப்பட்டன.



ஆஸாத்—வதிப்கான் குஸ்தி

குஸ்திக் காட்சி: உபநாயகிசாலையின் ஆதரவிலே ஆகஸ்ட் 17ம் தேதியன்று மலையார் ஆஸாத்—மங்கனார் வதிப்கான் ஆகிய ஸாண்டோக்களால் ஒரு குஸ்திக் காட்சி நடைபெற்றது. கெமிகல்ஸ் சிப்பந்திகள் அனைவரும் வந்து கண்டு களித்தனர்.





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METKEM—Printed by T. Sivaprakasam Pillai at The Trichinopoly United Printers Ltd., Tiruchirappalli.
 Edited and published by R. Parthasarathy, M. A., for the South Madras Agencies Ltd. Tiruchi.
 on behalf of the Mettur Chemical & Industrial Corporation, Ltd.