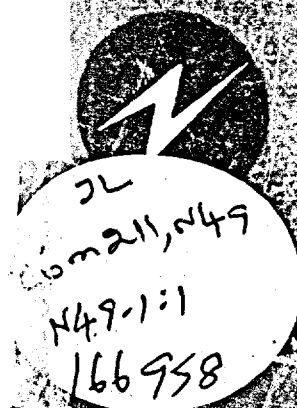
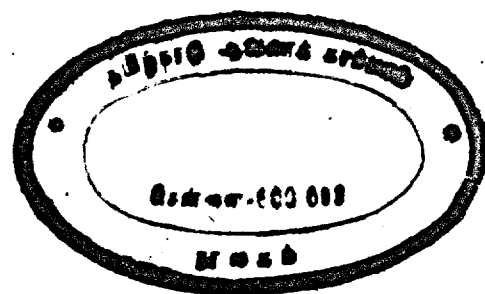


Electrolite

A Journal of Electricity Supply and Utilization



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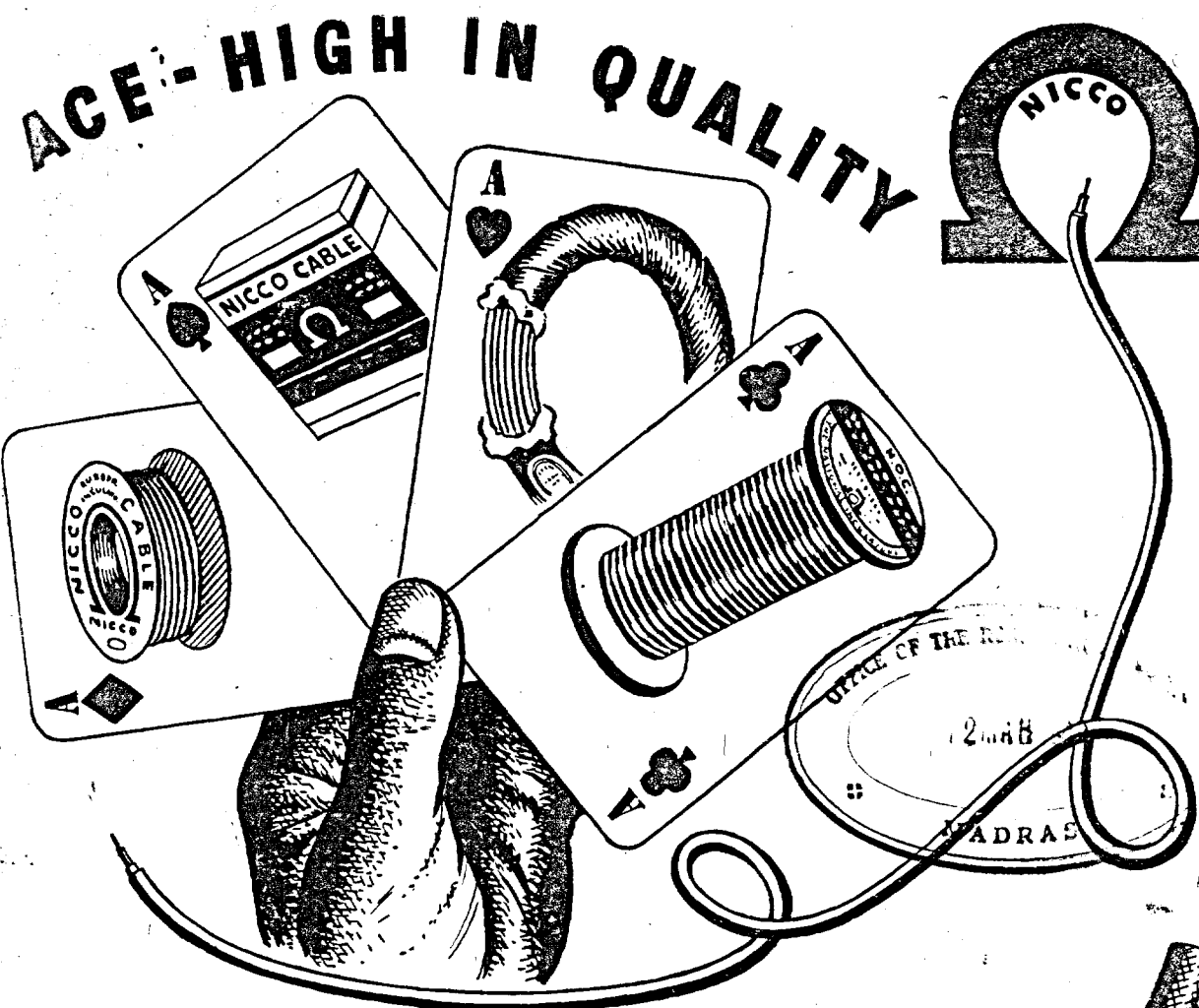
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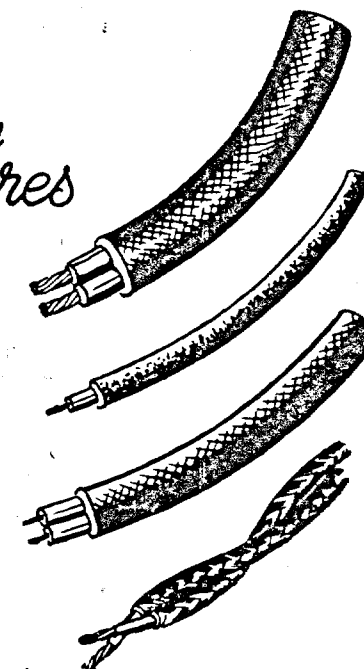
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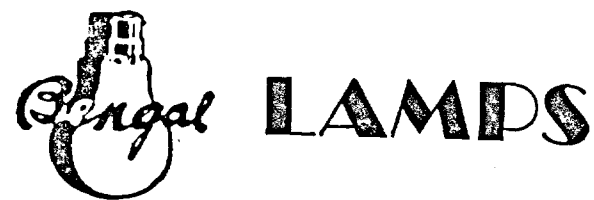


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ELECTOLITE

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

TIRUCHIRAPALLI.

Vol. I
No. 1

JANUARY - MARCH, 1949.

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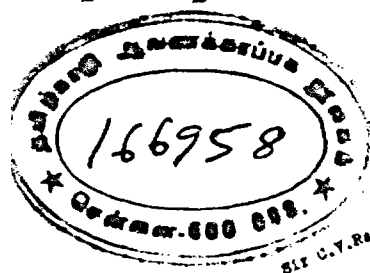
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The views expressed in ELECTOLITE are not necessarily those of the Editorial Board.

Messages



Bungalow No. 7,
Indian Institute of Science,
Bangalore, 3.
27th November 1948.

Message

Electricity and its manifold applications have profoundly benefited humanity. In our country we are yet very far from making the maximum use of it. The South Madras Electric Supply Corporation have done much to advance the use of electricity in Tamil Nad. It is therefore fitting that the Corporation should take the initiative in starting a Journal devoted to the cause of electricity. Such a publication can be of great service by bringing home to all concerned the benefits derived from the extended use of electricity and in strengthening the esprit de corps amongst those working in the field. I have much pleasure in conveying to Messrs. Seshasayee Brothers my heartiest good wishes for the success of the new Journal "ELECTOLITE".

C.V. Raman

The Grove, Teynampet,
Madras, Novr. 27, 1948.

My dear Seshasayee,

It gave me great pleasure to receive your letter of the 24th instant and its enclosure informing me of the proposal to publish a Journal under the title ELECTOLITE with whose objects and purpose I am in full agreement.

You have, throughout your career, been a pioneer in the development of industrial (and especially electrical ^{science}) in the South of India and your latest venture is bound to advance the objects which you have in view, namely, the building up of sound industrial and public relations and the education of the people in all aspects of wise industrialisation.

With kind regards and wishing the Journal all prosperity and success,

I am,

Yours sincerely,

C.V. Raman

Messages

CENTRAL ELECTRICITY COMMISSION
" Cleremont "
SIMLA

I am glad to note that your Company will be publishing a House Journal with the object of promoting Company-Consumer relations and also to publish articles of interest to the consumers. I wish your Journal popularity and a long career.

I am glad your Company is showing this awareness of the necessity to serve their consumers well and retain their goodwill. While there have been many notable exceptions, the complaint has been general in the past that the private distributing Companies were not doing all that they could have done to popularise electricity and make that the main strength of their prosperity. I trust that your Directors and Engineers will endeavour to set new standards of service and will demonstrate practically that the consumers in the adjoining rural areas as well as in the city limits can get good electricity service from an enterprising private distributor as satisfactorily as the Government Electricity Transmission Systems in Madras have been serving their consumers where they supply current directly.

Message.

N.N. Iengar
N.N. Iengar 3/1/49.

I welcome 'Electolite' the new Journal which is being sponsored by the South Madras Electric Supply Corporation.

The Corporation is one of the most progressive of licensees and it is in the fitness of things that it should bring out this publication to serve the cause of power supply in their area.

The Journal seeks to popularise the use of electricity and to improve consumer and staff relationship.

My best wishes go to the Journal for a long career of usefulness.

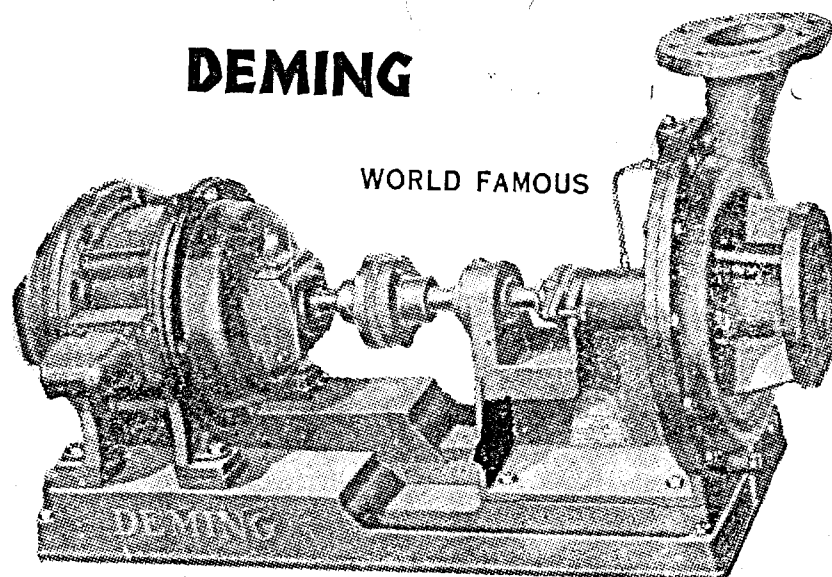
J. Sundaram

Chief Engineer for Electricity
GOVERNMENT OF MADRAS.

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EIGHT

Electolite

— EDITOR : R. PARTHASARATHY.

VOL. I

JANUARY - MARCH, 1949.

NO. 1

OURSELVES

A NEW journal is, usually, heralded by its sponsors with a word of explanation. This is, obviously, necessary, as otherwise, apart from a breach of form, a proper appreciation of the aims and objects of the publication is scarcely possible.

In announcing ELECTOLITE, may we state that its only purpose is to enable us to serve the public more effectively?

Although substantially more electric energy is generated and distributed to-day than in the past, supply has still to catch up with demand. Electricity for all, particularly for those in the country side, seems quite a long way off, yet. It is necessary, therefore, that we keep a watchful eye on the meter dials—until, at least, all the hydro-electric projects now under execution are completed.

A journal devoted to electricity supply and utilization, will, therefore, it is hoped, meet a real need. The end in view, it must, however, be emphasized, is public relations, not propaganda. And, between the two, there is all the difference in the world. To illustrate: Milton wrote *Paradise Lost* with this avowed object—namely, “to justify the ways of God to man.” Mussolini built a forum and filled it with figures of the type he regarded as fascist. The one is essentially a mental attitude, the other a mechanical technique.

By extension, ELECTOLITE does not presume to justify the ways of management to men. Rather, the object is to

state the case of management. Should a business continue, as such, it must not only understand the view-point of its public, but make the public realise and appreciate what it is trying to do.

Today, business has a new role. Gone are the days when one's business was, to borrow a familiar American idiom, just “nobody's business”. At present, business seems to be the concern of nearly everybody. Workers, shareholders, consumers, politicians—indeed all sorts and conditions of people—seek to direct business, and it cannot, for a moment, be pretended that the motives, in all cases, are purely altruistic. Small blame to labour, investment and the consuming public, if only a sectional advantage is pursued. The responsibility of management consists in striking as happy a balance as possible among the three factors involved. It is fairly an easy task to distribute the fruits of industry as wages for labour, return for capital and better value for the consuming public, but difficulty, often, arises in determining precise allocations for each.

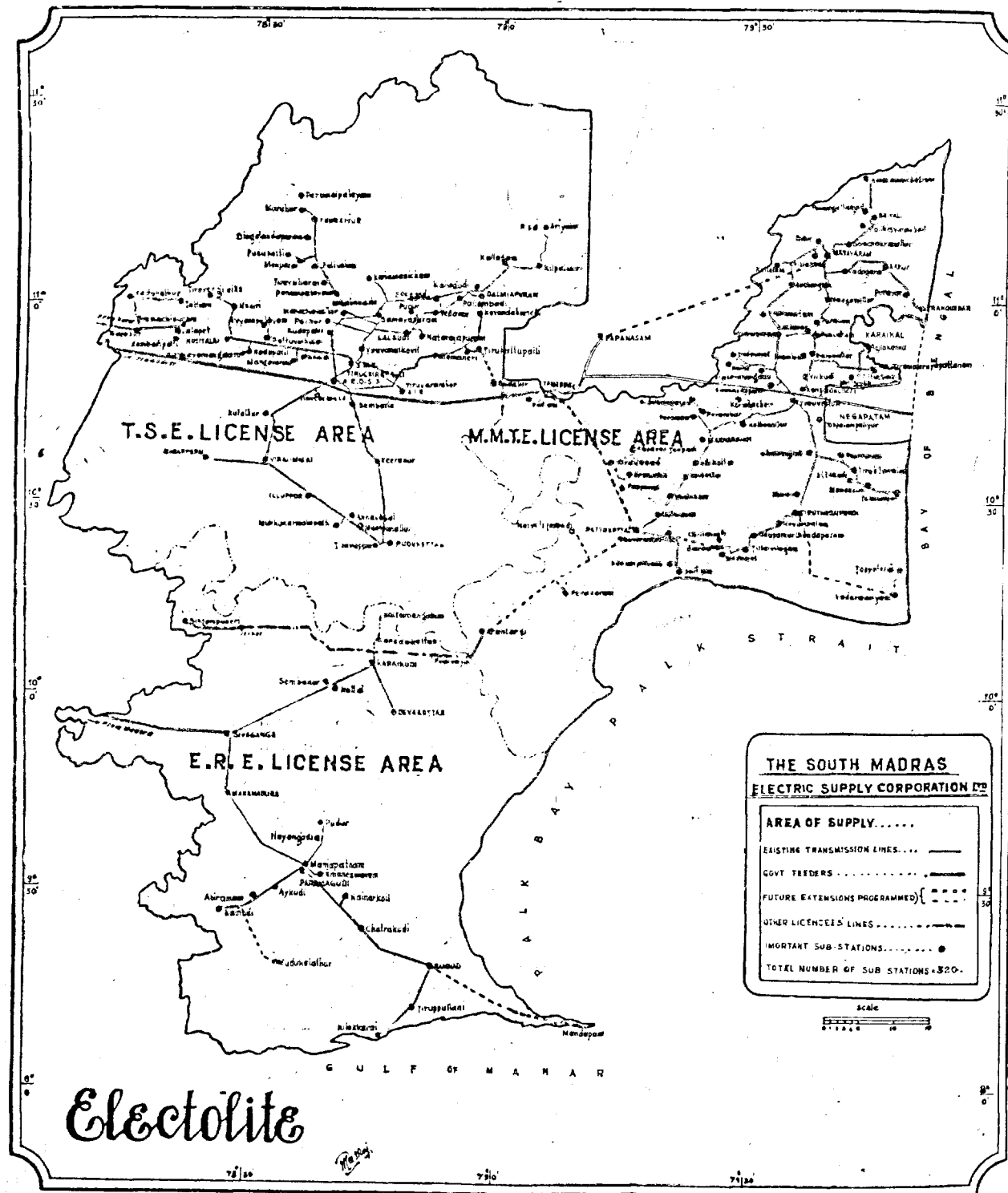
To the ends of serving the best interests of all the three parties concerned, ELECTOLITE is dedicated.

We require, therefore, the willing and active co-operation of all three—our employees, our shareholders and our consumers.

To our readers, then, may we make this request? “Tell us sometimes when we are right, but tell us *always* when we are wrong.”

NINE

AREA OF SUPPLY SERVED BY THE UNDERTAKING



TEN

ACHIEVEMENT OVER TWENTY FOUR YEARS

A BRIEF HISTORY OF THE UNDERTAKING

by

H. K. RAMASWAMI

HIS is a true story... And truth, as the adage has it, is always stranger than fiction.

The Corporation began with a power station of its own—with an installed capacity of 225 kw.

If this history reads like a romance, the *kudos* belongs elsewhere... to the Corporation, not to your humble scribe.

The number of people who would take electric supply were, however, very few, but still the Corporation did not lose heart. So firm was its faith in its ultimate bright future. At the cost of the Corporation and for purposes of demonstration and publicity was first put up street lighting over a distance of about four miles—round the Rock and

The South Madras Electric Supply Corporation Ltd., did not begin life as such. The nucleus was the Trichinopoly-Srirangam Electric Supply Corporation Ltd., later-day additions were (1) the East-Tanjore Electric Supply Corporation and (2) the East-Ramnad Electric Supply Corporation, both limited liability companies.

All the three companies were amalgamated into one—under the name and style of the South Madras Electric Supply Corporation—in the year 1940.

Incorporated in 1924, it took a little under a year for the Trichinopoly-Srirangam Electric Supply Corporation to receive its license. The foundation stone was well and truly laid by Sir C. P. Ramaswami Aiyer, then Law Member with the Government of Madras, on Dec. 5, 1925, and the first supply was switched on by Sir T. Desikachari on September 10, 1927.

A ministerial message... and a "medical" endorsement!

Dr. T. S. S. Rajan



Tiruvaramam,
Greenways Road,
Aiyar, Madras,
2nd January 49.

My dear Seshasayee,

Your letter of the 1st instant, I am glad to learn that you intend publishing a journal called "ELECTROLITE". As regards the information that you require, you are right in your statement that when the X-ray was switched on in my Clinic on the 27th of September 1927 it was Mahatmaji who switched on the current. It was certainly during the time when your supply commenced and it was then that I was able to get the current necessary for the X-ray department in my clinic.

Wishing your journal all success,

Yours sincerely,

Sri V. Seshasayee,
of Messrs. Seshasayee Bros Ltd.,
Trichinopoly.

ELEVEN



SIR C. P. RAMASWAMI AIYER laying the foundation stone

from the Rock Fort Gate right up to the Junction Station.

For about a fortnight, supply was only from dusk to midnight...until on one memorable evening Mahatma Gandhi said—so to speak—“**Let there be light (in Trichy all through the night) and there was light.**” On Sept. 27, 1927, Mahatma Gandhi switched on the current for the X-ray department in Dr. Rajan's Clinic...and incidentally inaugurated the all-night service of the Corporation.

History was thus made at night for a Company still in its swaddling clothes, but then it must be admitted that it had more than its quota of the usual teething troubles of any organisation.

A sensational law suit, Government restrictions and public apathy to electricity were among the minor difficulties;

TWELVE

the major one was finance. To say that capital was shy is to understate the case. Door to door canvassing had to be done both by the Managing Agents and by the Directors.

One, therefore, positively glows with enthusiasm to chronicle the fact that before the year 1928 was out, the public began to sit up and take notice of the Company, in no uncertain manner. This was not only because its supply was sound—its service was at once prompt and efficient.

So insistent was the demand for power in 1929 that the installed capacity of the diesel station was increased to 500 kw from its original 225 kw. The load went on increasing until, in the year 1933—installed capacity reached 1650 kw.

Greatly encouraged by the overwhelming public response vouchsafed to

the Corporation, the Managing agents secured the amendments necessary to the original license with a view to developing the adjoining rural areas in the district.

E. T. E. S. C.

Simultaneously, the Managing Agents also set about forming a separate company called the East-Tanjore Electric Supply Corporation Ltd. This was in the year 1933, and the proposed object of the new company was to serve the taluks of Shiyali, Mayavaram, Nannilam, Tiruturaipundi, Arantangi, Mannargudi and Negapatam.

The East-Tanjore Electric Supply Corporation Ltd., started supply with a Diesel engine station of 150 kw.

By this time, Government had started supplying power from their first hydro-electric station at Pykara to the districts of Coimbatore and Salem.

In view of the good base load of 1650 kw that the Trichinopoly - Srirangam Electric Supply Corporation Ltd., had already formed and their ambitious programme of development, as also, on account of the great possibilities that awaited rural development in the Tanjore District—for which again a beginning had been made by the East-Tanjore Electric Supply Corporation Ltd.—the Hydro-electric department of the Madras Government, extended their transmission system to Negapatam *via* Tiruchi and Tiruvarur, affording bulk supplies at these two points; so the generating stations of the Corporations were asked to be closed down. Soon afterwards,

however, Government feared that they would not be able to meet all demands during summer—not being quite ready yet with their water storage facilities at Pykara; the generating stations of the two Corporations had, therefore, to remain just in case....

From 1935 onwards, the two companies embarked on vigorous programmes of rural development. Particularly noteworthy was the working of the East-Tanjore Electric Supply Corporation Ltd. Barring the three municipal towns of Tiruvarur, Mayavaram and Mannargudi, the area was truly rural. The only industry of the area was rice-milling—and being a delta region—the possibilities for agricultural pumping were slender. At the time, the Company started functioning, fuel oil was cheap and it required a good deal of persuasion and a great deal of drive on the part of the management to wear down the sales-resistance of the rice-milling industry, for electric power. It greatly redounds to the credit of the management that it should have shown vision and fore-sight at a time when these were more or less vague abstractions. Attractive terms and hire-purchase facilities were among the inducements offered. By such methods as these, was the management able to secure a firm footing for electricity, in rural areas.

E. R. E. S. C.

Then was formed in the year 1936 the East-Ramnad Electric Supply Corporation Ltd. Its objects were (1) to distribute electricity in the taluks of Ramnad, Ilayangudi, Paramakudi, Mudukulathur

THIRTEEN

and Manamadura in the Ramnad district and (2) to effect bulk supplies to the existing licensees serving Devakkotai, Karaikudi and Chettinad. The district of Ramnad was rather poor in several respects. The overall area was sparsely populated and mainly consisted of villages placed at distant points. There was hardly any industry worth the name - nor could the scope for agricultural development hereabouts be described as anything great. The tenant had little or no interest in the land as most of it was of Zamindari tenure.

Even in such an area, however, really good progress was made. Indeed, progress should have been more marked had it not been for the War and the resultant rise in the cost of construction materials.

S. M. E. S. C.

As already stated, all the three companies were amalgamated into one, and called the South Madras Electric Supply Corporation Ltd., in the year 1940. The objects were (1) to ensure savings in overheads in management (2) to bring about, under a unified technical control, a co-ordinated development of all the three areas concerned and (3) to have uniform tariffs, in the areas, so far as practicable.

Unfortunately, the War and the inflation of costs that followed in its wake both on materials and in general living have necessarily had to retard the progress that the company was eagerly looking forward to register.

FOURTEEN

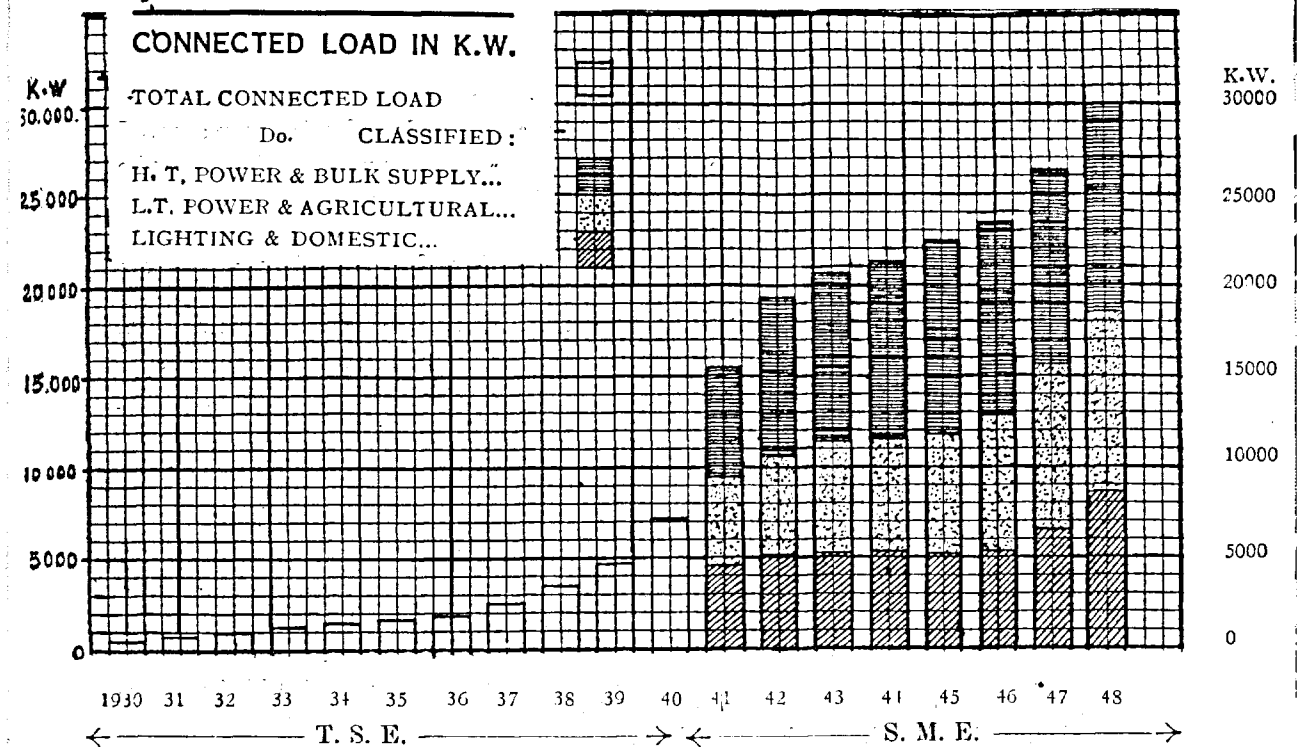
The map on page 10 shows the area of supply controlled by the Corporation and the extent of its present service. It will be seen from it that, so far, only a part of a vast territory has been covered. A large area still awaits exploitation. The number of consumers now served by the corporation is around 30,000.

Everyday, the Corporation receives countless enquiries for power, for small industries, for agricultural pumping and ancillary purposes, and for the lighting of the home. Much as it would like to meet all these demands and more, the handicaps are far too many. The chief ones are :

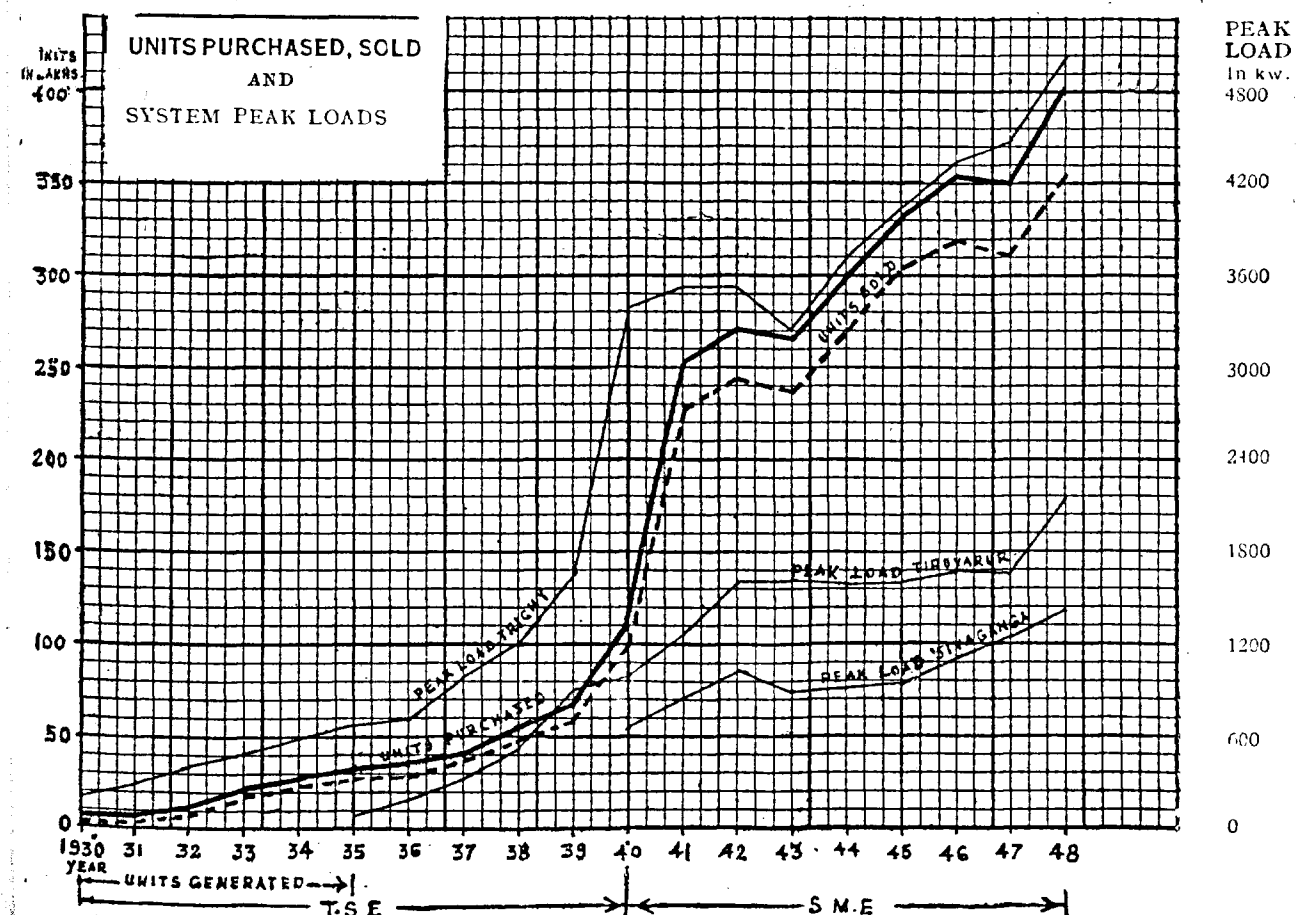
1. *Lack of power in the hydro-electric station of the Electricity Department:* Loads have increased beyond expectations on the different parts of the hydro-electric system. The position now is that further demands for power cannot be met till the new extensions at Pykara, Papanasam, Madura and Madras come up. These extensions are well under way and are expected to be completed by the end of 1951, provided, of course, equipment from abroad comes in, to schedule. Experience, however, tells us that we had better temper our optimism.

2. *Scarcity of materials for the construction of transmission lines and distribution systems; particularly, steel for transmission poles, transformers and switch-gear for sub-stations:* Steel is in acute short supply and only meagre quotas are allotted even to such priority holders as Electricity Supply Authorities.

GRAPH I



GRAPH II



Alternative materials like concrete poles and wood poles are being tried, but costs in the one case, and doubtful results in the other have tended to cool off the first, fine careless rapture.

3. *Finance*: This is, also, becoming an increasingly difficult problem. The statements issued by Government spokesmen from time to time about the imminence of Nationalisation are not calculated to encourage investors. If anything, capital has only been scared away. The companies themselves have been prevented from making long-term plans—because of their probable doubtful future.

Should these problems be solved as, in the fulness of time, doubtless, they would, the objective of the National Government—namely, to take electricity to the villager so as to introduce a little ray of “sunshine” in his otherwise dull life would not be incapable of realisation.

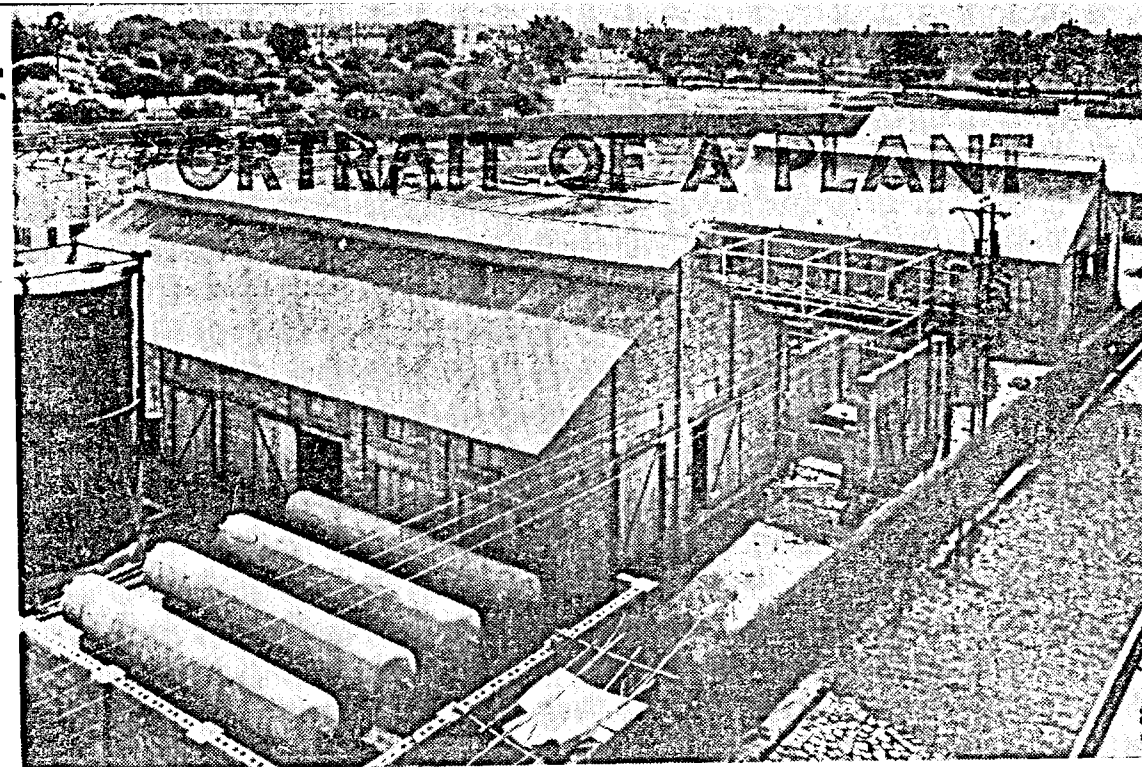
The statistical tables shown on page 15 tell their own tale—more vividly perhaps

than any words of mine can; so, I would refrain from what would merely be a verbal duplication.

Regarding future policy there are many arguments of an economic character in favour of the State gradually taking over sources of generation of electric power, but where the distribution and sale of electric power are in the hands of an enlightened and progressive management such as this Corporation, then it would not be in the public interest to make any other dispositions.

Strictly speaking, I should have enclosed the last para in inverted commas, as the words are those of Major Howard—a former Chief Engineer for Electricity of the Madras Government, but if I did not do so, it was because I wanted to draw attention to a slightly more significant fact—namely, that the verdict was passed in 1933—in which year of Grace, there was hardly any talk of Nationalisation.

by
G
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20-TON VEGETABLE GHEE PLANT OF M C I C LTD., PUDUR

*N*EXT time you run into an anemic, half-portion of a man take a more charitable view of him. The poor fellow is, probably, not to blame; he is not living on the fat of the land in the ordinary “garden” sense of the expression.

For a population of 370 millions, the oil and fat resources of India—for edible purposes—could scarcely be considered adequate. The country can take care of only a *per capita* consumption of 11·2 lbs. a year—roughly working out to 0·5 oz. a day. Against this, the recommendation of the Nutrition Advisory Committee of the Indian Research Fund Association is for an annual *per capita* consumption of 45 lbs. or 2 oz. a day. As currently estimated, however, the edible and fat resources

of the country are as under:

Ghee and butter	..700,000 tons	35·00 per cent
Vanaspathi	..150,000 „	7·5 „
Vegetable oil	1,150,000 „	57·5 „

Should the dream of 2 oz. *per head per day* come true it is on the cards that the Vanaspathi Industry is having a date with Destiny.

The usual trouble with vegetable oils is that these cannot be stored for any length of time. Liable to become rancid on storage, the less said about the keeping qualities of ordinary oils, the better.

The purification and the refining of the oil helps it retain its freshness, for longer periods. Like ghee, in appearance, Vanaspathi is an acceptable substitute. Again, its firm consistency makes it less prone to leakage in transit.

Generally, Vanaspathi factories in this country have groundnut oil for their principal raw material. The addition of refined or hydrogenated gingili oil to the extent of at least 5 per cent has now been made compulsory by Government. This is to prevent the use of Vanaspathi for adulteration with ghee.

Before the War, South India did a flourishing export business in groundnuts. Now, only a part of the produce is exported, with most of it being crushed in local areas. Vanaspathi factories in this part of the country, have, therefore, a real purpose to serve, in that they can absorb, for their own use, most of the crop raised in the districts of South Arcot, Tanjore, North Arcot, Coimbatore and Salem.

So patent is the need for electric energy to Industry that it hardly requires to be emphasised. Among the industrial consumers served by this undertaking is included now the Mellur Chemical and Industrial Corporation Ltd; their new 20-ton Vanaspathi plant at Pudur is fast approaching completion. Here's a guest writer, the Plant Superintendent, giving us an account of his factory—and what a big part electricity plays in it.

IDEAL LOCATION

Amongst the factories sanctioned by the Central Government in the South is the one, now nearing completion at Pudur, about a mile and a half, from Tiruchirapalli Railway Junction. The factory is expected to produce 20 tons of Vanaspathi per day.

Tiruchirapalli must be considered very well-situated, indeed, for developing the Vanaspathi industry.

The railway station here can handle both broad and meter gauge traffic. The availability of water and power,

good living conditions for labour and above all—the nearness of the place to producing districts like Pudukottai, Tanjore, South Arcot, etc., make Tiruchi ideal.

The Pudur Vanaspathi Factory is to go into commercial production very soon. It will be consuming groundnuts of the order of 700 bags—approximately 52 tons—per day. Most of the oil required is proposed to be crushed in the battery of expellers put up at the factory itself.

In addition to oil, however, several process materials such as common salt, activated carbon, bleaching clay, caustic soda, etc., are required.

HYDROGENATION PROCESS

The complete process may be briefly described here :

First, the raw oil is refined by the removal of the free fatty acids, as crude soap, obtained by the addition of caustic soda solution. Then, in the second stage it is washed with hot brine and hot water, so as to free it from soap. In the third stage, the neutral oil is bleached and clarified. In the next stage, oil is hydrogenated. Hydrogenation is the process of passing pure hydrogen gas into the hot oil in the presence of a catalyst. The hydrogen enters into chemical

combination with the oil and hardens it. In the final stage, this fat is further clarified and deodorised. The finished product is, finally, cooled, packed in tins, and chilled.

A brief mention may, also, be made here of the plant used for making drums. This plant is capable of manufacturing containers from 5 lbs. to 4 glns.—from tin-plate, and except for the final soldering, the process is entirely mechanical.

The thread of mechanical handling, both of the raw materials and of the finished product, runs right through the fabric of the whole factory. Tedious and unskilled manual work has largely been eliminated.

We have also plans for utilising the soap stock for the manufacture of both washing and toilet soaps, at a later date. In passing, it may be mentioned, that our "Cauvery" brand bar soaps have already made a great hit with housewives all over the country

POWER.

My portrait would hardly be complete if a little of the 'canvas' was not devoted to sketching what electricity is doing for us. The connected load required for this factory is distributed as under :—

Main Plant consisting of all the	
Processing vessels	.. 200 H.P.
Water system—Pumps etc.,	.. 100 "
Workshop	.. 40 "
Soap Plant	.. 30 "
Tin making Plant	.. 10 "
Expellers	.. 120 "
Hydrogen generators with	
Hydrogen and Oxygen	
compressors	.. 220 "
Factory lighting	.. 30 "

Total.. 750 H.P.

This power is obtained from the South Madras Electric Supply Corporation Ltd., by a 11 kV. transmission line from their Pudukottai spur line. In the factory has been installed, at present, an out-door type sub-station comprising three 11 kV./400 volt transformers of 250 kVA, 200 kVA and 100 kVA, but the ultimate idea is to increase the capacity to 750 kVA with three 250 kVA transformers. The distribution of the L. T. power in the factory is by bare copper feeders outdoors, and by tough rubber covered cables, indoors. As the factory will run all through the twenty-four hours, a high load factor will invariably be maintained.

Electricity is mainly used here for the drives of the various process plants. Straight induction motors of the squirrel-cage type are used, the drives being generally by gearing. For controlling the various machinery parts, again, the most up-to-date automatic control devices are being used.

The hydrogen generation, again, is by the electrolysis of water, and for this purpose a motor generator set and electrolyser cells are used. The oxygen liberated in the process is compressed and sold to the Indian Oxygen Acetylene Company, for use in their welding processes.

Without power, an industry of this type is scarcely conceivable, and our thanks are due in no small measure to the South Madras Electric Supply Corporation Ltd., for the magnificent piece of work that they have, so ably and so expeditiously, done for us.



The Making of Chemical Diamonds: *Inside Story of Outside Help*

BELIEVE it or not, Tiruchirapalli required a global war to develop a cottage industry! And the industry...the manufacture of artificial diamonds.

Before World War II, the demand for synthetic diamonds was mostly met from Burma. The war interrupted this supply enabling a local industry to come into its own. Indeed, even today, the accepted nomenclature for artificial diamonds is Rangoon Diamonds. For aught one knows, the diamonds might have been manufactured in Tiruchirapalli!

Be that as it may, it cannot, for a moment, be gainsaid that there exists a growing demand, in the country, for artificial diamonds. The reasons are not far to seek. For one thing, one has glamour without the cost, and as Oliver Goldsmith might have put it, 'elegance without affectation'. For another, if a necklace made of artificial diamonds is lost or stolen, the loss is not likely to be half so poignant—were it of real diamonds!

Talking of Goldsmith, the war deprived local goldsmiths of one of their most precious raw materials. But native ingenuity triumphed over a supply crisis in the trade, and a new industry was developed and perfected.

The raw material required for the manufacture of artificial diamonds is known by the name of *Pusa* and is imported, for the most part, from Switzerland. Before the war, the material came from Germany and France.

MANUFACTURING PROCESS

As an aid to cottage industries, the importance of electricity is now being increasingly recognised. In the manufacture of artificial diamonds, a flourishing local industry, for instance, electricity plays a significant part both as motive power and as illumination agent.

Small fractional H. P. motors of the repulsion induction type are used for the cutting of the stones and three-phase squirrel cage types for the grinding and the polishing processes. For lighting the premises, again, electricity is necessary. Even the "cunningest" craftsman will not be able to make a neat job of it, in poor visibility.

Pusa arrives as crystals and cylinders, raw and rough, usually two inches in diameter, and in varying lengths.

Available in all the colours of the rainbow, as also as a pure transparent block, *pusa* is, in a sense, the perfect answer to a maiden's prayers!

Four stages constitute the manufacturing process.

First, the *pusa* is cut into small convenient cubes. In the smaller factories,

this is done on a small circular cutter operated manually by a bow. Where the volume of work turned out is considerable, a $\frac{1}{4}$ H. P. electric motor—off a counter shaft—is used.

Secondly, the cubes are shaped into small rounds or squares depending upon the nature of the final 'finish' required. This is done manually, on grinder plates about 8" in diameter. The plates are coated with an abrasive—carborundum powder—sprinkled over sealing wax—and rotated manually by a bow.

As the wheel goes full circle, the worker holds one cube after another—mounted on a thin wooden stick with wax—and grinds it to the required size and shape.

The third stage is reached with the cutting of faces on the objects thus obtained. Here, again, a grinder plate made of lead and coated over with carborundum abrasive is used. Mounted again on a stick with wax, the worker cuts the faces required by the most expert grinding imaginable on the plates—worked either manually or electrically. A number of such grinding plates are ganged on a bench, and run by a common motor.

The final stage is polishing. This is done on perfectly polished circular iron plates, smeared over with cocoanut oil and finely-ground, real diamond powder. About thirty to forty of these plates are run off an electric motor—of 3 to 5 H.P.—at about 4000 r.p.m. The unpolished but shaped diamond is held on to an iron wire by wax, the worker holding the wire in a

hand-vice. Afterwards, pressing the "rough diamond," he carefully polishes all the faces, one after another, on the disc—going at a terrific speed. No part of the stone is thus left unpolished, as otherwise, the result may be shoddy.

After polishing, the diamonds are washed in hot water containing a little washing soda, so as to remove all traces of dirt and the 'sticking oily substances'. **THRIVING TRADE**

The finished goods are then cleaned, graded, and are ready for the market...and another sub-urban wife is nagging another sub-urban husband!

Badinage apart, a number of such factories exist in and around Tiruchirapalli. Some of these are, indeed, big enough to come under the Factories Act—as over 25 workers are on the pay-roll. But the majority of the factories are small-size units where the members of a single family do the work, often using a part of the pial, for shop.

One note-worthy feature that struck this writer was that most of the work was being handled by teen-age lads, although in the final stages, the cutting of the facets, polishing, etc., was done by a master-craftsman. The work involves great skill, and would try the patience of a Job. Considering, however, that this is not the sort of work to impose much physical strain upon a person, one rather wonders why women are not being engaged. Only conservatism must be responsible, or perhaps, the craftsmen realise that the "eternal feminine" in their own women will be bad for trade!

ELECTRICITY

MAKES CONCRETE STRONGER

by A. W. HASLETT

FEW people think of reinforced concrete—the building material of the modern world—as the place in which one would find “stray” electric currents. Yet so it is, and these currents and their effects on the strength and possible uses of reinforced concrete have been sufficiently important to lead to years of investigation by scientists.

The results of work on these lines by the British Electrical and Allied Industries Research Association have just been published and mark a new chapter in an interesting story of research.

Electricity is one of the most powerful agents promoting chemical change. It is used, for instance, in electro-plating and in the separation of aluminium, magnesium and other metals from their ores. There is also a small natural flow of electricity when metals and water are brought into contact and this is responsible for a large part of the world's rusts.

Because of such effects the United States National Bureau of Standards began some 30 years ago to study the

effect of leakages of electricity on reinforced concrete. Behind this investigation was the knowledge that concrete poles might be used to carry high-tension cables as is the common practice today. Investigation has been carried on and extended during the past 12 years by the British Electrical and Allied Industries Research Association. The results have been almost wholly reassuring.

A. C. DOES NO HARM

It has been found that a leakage of the alternating current—the most common case in practice—does no harm to concrete under any reasonable conditions; while in the case of the direct current there may even be an increase in strength. This is because the strength of the binding between the concrete and its steel reinforcement may be increased under right conditions.

The investigations into reinforced concrete aimed at discovering the effects on the material of electrolysis from the leakage of currents. Electrolysis depends upon the fact that most common

substances when dissolved in water behave as if they have been split up into two parts—one of which is positively charged and the other negatively. These are called “Ions.”

Normally, the ions move around in water at random without any tendency to stream in one direction more than another. But if two metal plates are placed in the water, one charged positively and the other negatively, they will influence the movements of the “ions.” Those which are negatively charged begin to move towards the positive metal plate, and those which are positively charged towards the negative plate. And that, in essence, is the process known as electrolysis. It is used in electroplating to deposit a thin layer of one metal on another. Chromium-plating is a familiar example.

CONDITIONS FOR ELECTROLYSIS

For electrolysis to occur, then, certain conditions must be met. For instance, water must be present; there must be two metal plates in contact with it and there must be an electrical pressure between the plates.

In the case of reinforced concrete most of the conditions are always satisfied; usually all of them hold. At least there is some water in the concrete, and the steel used for re-inforcement is equivalent to one metal plate. The second metal plate will probably be provided by some outside metal, and in a power-cable post the last condition can easily be met by any small and unnoticed leakage of electricity.

To study what may happen experimentally, it is simplest to begin by making up a concrete cylinder with steel “re-inforcing” rod down the middle. The cylinder can then be stored in water and surrounded by a metal plate, and either direct or alternating current can be applied between the reinforcing rod and the outside plate. In the American investigation which was confined to direct and not to alternating current, it has been found that if the reinforcement was made positive then a rustlike deposit was formed on it and that the reinforcement was sufficiently increased in size by this deposit to cause a cracking of the concrete surrounding it. There was no such spectacular effect if the reinforcement was made negative and, in fact, no damage was caused provided that the concrete was completely free from salt or any similar substance.

BRITISH RESEARCH

These results were used as the starting point of a long and carefully planned programme of investigation which has been carried out by Dr. G. Mole and his collaborators of the British Electrical and Allied Industries Research Association. There have been two main objects—to confirm the earlier American work, to extend the study to cover the common effects of alternating current electrolysis and to find out the effects that direct and alternating currents have on the binding between the reinforcement and the concrete as well as on the concrete itself.

The most important result is probably the one first quoted—that the alternating current can be regarded as harmless. The most interesting is the discovery that, when the direct current is used with the reinforcement bar as the negative plate, the strength of the binding may be increased by between 25 and 100 per cent. according to conditions.

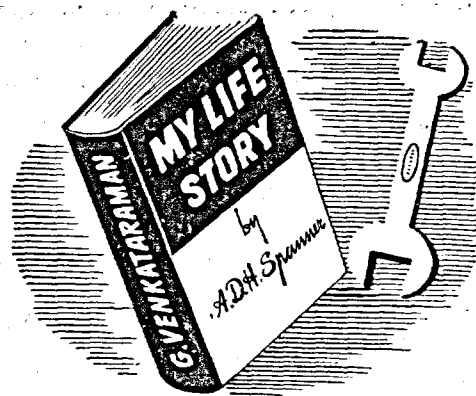
This is because a thin layer of calcium carbonate is deposited as a chalk-like material in the boundary layer between the concrete and the reinforcement. If this were due solely to the current, the calcium carbonate could be quickly deposited and an appreciable gain in the strength of the concrete could be speedily secured. But for calcium carbonate to be formed it is necessary also that there should be carbon di-oxide in solution in the immediate neighbourhood of the reinforcement. In fact, there is—but only in a very small amount.

FOR SPEEDY SETTING?

Further ingenious work by scientists has shown that for carbon di-oxide to be replenished it is necessary to spread out this cementing process—as it can be regarded—over about a year. By this time the concrete will already have hardened appreciably by its own normal setting and an extra gain in strength would probably not be worth the prolonged treatment necessary.

It is just possible that conditions might be found under which this internal cementing process might be speeded up. It is of interest, in the meantime, that the form of treatment which was expected to weaken reinforced concrete has actually been found, under some conditions, to give it extra strength.

[BIS]



"TWO heads are better than one," says the wisdom of the ages. Why then regard a twin-headed child as a monster? That was precisely the attitude my people took when I was born—way back in 1937. I don't know whether or not I was born with a silver spoon in my mouth(s), but from the worshipful manner with which they looked into mine, I knew that I was going to play a very important part—in other people's lives!

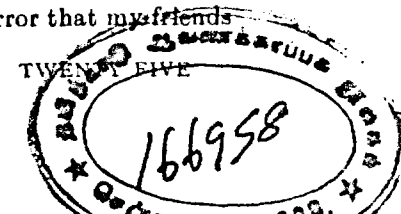
Sheffield, my birth-place, is still a pilgrim centre. I cannot, perhaps, overstress the fact that I saw the light of day, when father didn't have a care in the world and not certainly what was later on philosophically referred to as a Production Crisis, and mother didn't have to bother about an Economic Blockade. My ancestors might not have come to England with the Conqueror, but still my pedigree was something to write home about. I can't recall how many pounds I weighed at my birth, but opinion was practically unanimous about my good health. No puny anæmic

weakling was I, as was mostly the case with many war-time babies.

Almost right from my birth I knew that I was destined for a career of adventure. So, when my people packed me off to India, on my very first birthday, I didn't waste time in idle tears. After rather an uneventful voyage, my boat berthed in Bombay harbour on March 2, 1938. The officials of my hosts—a well-known wholesale firm—were there at the quayside to receive me... and how! An ambassador could not have been more warmly welcomed or more courteously treated. Oh Lord, how they sang my praises in the Press! Had I been more fair-complexioned, the blush of shame should have completely mantled my cheeks. Had I been a bit less modest all their flattery should have gone to my head(s)!

But the price on it/them was also high. One South Indian Electric Supply Corporation, wiser than the others, realised that I would be cheaper in the end, and so sent for me. But, I am sorry to say that the firm let me down, rather badly. Had I but the least foreknowledge of what was in store for me here, I would have cheerfully committed suicide *en route*, jumping overboard and meeting with a watery grave, as our journalist friends delight to put it.

How rudely they handled me! After the most cursory examination, a lineman positively stripped me, and threw me down, mind you. It simply did not occur to him to give me a seat. I very nearly fainted, and when I came to, I discovered to my horror that my friends



and relations were lying by my side in various conditions of mutilated distress.

God, how I prayed that night to save me from my tormentors. But my prayers were not answered. The same lineman who treated me with such scant respect the previous day was to be my future lord and master. Before committing me to his charge my care-taker assured himself that I would be looked after carefully, and as became my station. The lineman gave him a written promise to that effect, probably because he had hardly any idea of keeping it!

Well, to start with, he asked me to remove a nut from a pipe bracket which was there in all likelihood from pre-historic times! Clearly, this was work to which I—or rather my master—was not equal. But he applied his full brute strength to the job. The nut, however, refused to budge even the tiniest fraction of an inch. This infuriated him and he let his steam out on poor me. What could I do?

“You something unprintable! You swelled-headed rascal, you must learn to take the rough with the smooth.”

What he meant by the remark was that no soft treatment awaited me out in India. But I took it in another light, and thought that the injunction jolly well applied to him, indeed, more than it did to me. He must learn to take the rough—namely, the nut, with the smooth—namely me. To teach him this elementary lesson I let myself go bang on his head. And at once the lineman saw red. He

TWENTY SIX

looked into my mouth(s) again and grinned. As he took his hammer in his hand, I knew that the worst was coming. He once more asked me to remove the nut. And once more did I refuse. Not that I was not willing, but the nut was most unwilling, I knew. Parting, with it, was such a “wrench,” you see. The nut required a bit of coaxing—some kind of grease, some oiling or buttering. But my know-all line-man thought that a little punishment would make me more co-operative. Presumably, he belonged to the spare-the-rod-spoil-the-child-school of thought. Ye gods and saints, how he beat me! Unable to take it, I took cover in a neighbouring hedge. As I looked at my badly bruised body, I realised that a career of promise had been brutally cut short by a thoughtless line-man. I thought hard and bitter thoughts about the Corporation and the line-man... And yet, what could the poor devil do? I pitied his ignorance and was regarding him, in what I thought, was an accusing sort of way. About the same time, his glance too happened to fall in my direction. As he took me in his hands, there was contrition in his heart; it was writ large on his face.

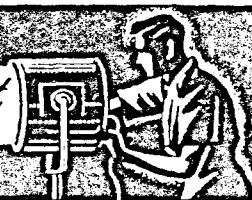
Full of meaning, he cast a sad look on me. Soon, he cast me also into a scrap-heap... as full of meaning.

(To be continued)

Not in *ELECTOLITE*!

—Ed.

Turning the LIGHT on your Subject



Q. 1. I have installed a 3" centrifugal pump, directly coupled to a 5 H. P. Sq. cage motor, in my well, for agricultural pumping. The pump-set is specified to deliver 18,000 gallons of water per hour at an over-all head of 30 ft. The water level in my well is within 8 ft. from the ground level. For want of 3" pipes, I have used 3½" pipes for suction. After, however, an hour or so of working the motor gets excessively hot. Why?

A. You state that the pump is designed to work satisfactorily at an over-all head of 30 ft. If the pump is worked at a lower head, naturally, it will tend to deliver more water which, in turn, means more horse-power. Added to this, you are using a bigger suction pipe. All this adds to the load on the pump and on the motor. And this over-loading is seen as an over-heated condition.

Before a pump is chosen for a well, correct measurements of the water level, both during the rainy and the summer months, must be taken. The pump should be provided with a motor capable of taking the full load on high water levels. Suction pipes should be of the size specified. It would further improve matters, should a gate valve on the delivery side of the pump be provided.

Q. 2. I am running a mill with a 15 H. P. motor for rice and flour milling. The supply company supervisor, often, complains that my earthing is defective, and that this is dangerous. Please let me know what I should do.

A. According to article 58 of the Indian Electricity Rules, 1937, all metal-clad electrical appliances, motors and machinery should be well connected to earth by two distinct “earth wires” at

two different points on the equipment. Earthing is necessary in the interests of safety; internal faults sometimes develop in the machinery and such faults may often, cause the body of the motor and the metal-clad appliances to be raised to a high voltage. Anybody coming in contact with these metal parts is, therefore, likely to be electrocuted. But, if metal is connected to earth the faults will cause heavy currents to flow to earth blowing fuses or opening out circuit breakers. Equipment is, thus, isolated and safety is ensured. The neutral in every distribution is earthed to provide an easy path for such fault currents. This neutral is made available by the supply company to the consumer for earthing purposes. You should connect all the metal-clad appliances by means of a bare copper wire of not less than 12 S.W.G. (a bigger size, say, No. 8 will be better—being mechanically stronger) to the company's “earth” at the meter board. The second “earth” is provided by a 6 to 8 ft. length of 1" or 1½" G. I. pipe driven into the ground so as to reach the permanent moist portion of the earth. If the ground is hard it is better to dig a pit and fill it with charcoal and pebbles and to fix the pipe to it. The pipe should be plugged on to the top and a trough prepared all round so that by artificial watering and rain water, the place is kept moist and ground resistance is kept as low as possible. To this pipe the appliances should be connected by means of another 12 S. W. G. or 8 S. W. G. copper wire. Galvanised iron bolts and nuts should be used at the pipe end. On the appliances, the makers would have provided suitable connections for making the earth connections. S. S.

TWENTY SEVEN

CURRENT TOPICS

HYDRO-ELECTRIC DEVELOPMENT IN COCHIN

AT a time when Provinces and States in India are launching several multi-purpose hydro-electric projects, it will not be out of place briefly to trace the efforts made by Cochin to step up the industrial advancement of the State. One of the most important schemes undertaken by the State in this connection is the Poringalkuthu Hydro Electric scheme. Preliminary investigations show that the potentialities for Hydro-electric development in Cochin State lie chiefly in the Chalakudi river. This river is fed by tributaries which rise in the Annamalai and Nelliampathi ranges, and has a catchment area of 370 square miles about the point where the development of power is now proceeding.

Power development appears possible at four sites within a six-mile stretch of the river—two primary sites comparatively close together but on different banks of the river and two subsidiary sites downstream of the primary sites where the tail waters of the primary sites can be re-utilised on low head schemes.

The development falls naturally into five progressive stages, and, when these

stages are all completed, will result in 100,000 kw of continuous power, or 200,000 kw at 50 per cent, load factor, being available for use.

The first stage now under construction consists of the building of a dam across the river above the Poringalkuthu Falls, to obtain a storage of 1,200 million cubic feet of water (28,700 acre feet). Water will be taken from this reservoir through a tunnel nearly 4,000 feet long, with a cross-section of 140 square feet, to a Valve House and thence through three 53" internal diameter pipe lines to machines in the Power House. A gross head of 595 feet is available, and the first stage installation will consist of 3×8,000 kw M. C. R. Francis turbine driven generators, that is, 8,000 kw at 50 per cent load factor plus one stand-by set.

The second stage will involve the erection of a dam about four miles upstream of the first stage dam site—to store up to 21½ thousand million cubic feet of water, and the installation of two 64" pipe lines and two 12,000 kw M. C. R. turbine generators in the Power House. This will raise the capacity of the Power House to 24,000 kw continuous, or 48,000 kw at 50 per cent, factor load.

The erection of the second stage dam will provide storage to enable the third stage to be proceeded with.

This development should result in about 75,000 kw at 50 per cent, load factor.

The fourth stage comprises the development of the Adirappilli Falls where a head of approximately 300 feet appears possible. This will result in about 50--55,000 kw at 50 per cent load factor. If necessary, this development could be divided into two stages.

The fifth stage comprises the development of the Vazhachalkuthu Falls where a head of approximately 190 feet appears possible. This would result in about 20--22,000 kw at 50 per cent load factor.

The total expenditure involved in the scheme will be in the nature of Rs. 20 crores.

[B.W.]

MADRAS ENGINEERS IN U. S.

Three groups of Indian Engineers from Madras, the East Punjab and the United Provinces are now studying American methods of large-scale hydro-electric development.

Madras was the first province to send engineers to the U. S. A group went over there about two years ago to prepare preliminary designs for the Ramapadasagar project. After the return of this group, about eight months ago, another group left for the States under the leadership of Mr. U. Ananda Rao,

Superintending Engineer. They visited during November last the Tennessee Valley Authority and the Bureau of Reclamation Projects, at Denver.

NEW WONDER WASHING MACHINE

Ninety-four per cent of the output of a new electric washing machine, being made by a South Wales firm, is being sent overseas to meet export demands, states a report recently received.

This "washer", the outcome of three years of development work, has been described as the "machine for the million". Priced at £ 25 (Rs. 332)—in the U. K., excluding the purchase tax—it operates on a new principle, washing 3½ lbs. of clothes in an average of four minutes. It makes the minimum demand on household space, measuring only 30" x 16" x 18".

An outstanding feature of this machine is a pulsator which is placed flush in the side of the stainless steel container thus preventing frictional contact with the washing and minimising the usual wear from cleaning. The pulsator is driven in one direction at a constant speed. In addition to turning water and clothes in the same direction, its working sets up other currents of water causing clothes to be turned about in all directions.

CHESS-PLAYING ELECTRIC "BRAIN"

An electrical "brain" which, when developed could be taught to play chess

has been invented by scientists at a "nerve" hospital in London.

Known as "Homeostat", it consists of four simple magnets connected with a number of electrical circuits. When the brain is in its normal balance, the magnets cling together. When anything upsets the balance of the magnets the machine can use combinations of 27 electrical circuits to restore the balance. This means that it can choose any of 390, 625 methods to defeat whatever is trying to destroy its balance.

Dr. William Ross-Ashby, the inventor of Homeostat, claims that if the principle of operation were used in a "brain" many times larger it could be taught to play chess. "It uses a new principle," he writes in the *Journal of Electronic Engineering*, "and can easily be extended to give much more powerful developments".

This new machine took 15 years to design in principle and two more to build.

ELECTRICITY DEPT.: PARTICIPATION IN EXHIBITION

One of the biggest attractions in the All-India Khadi, Swadeshi and Industrial Exhibition held recently in Madras was the stall of the Electricity Dept. The serpentine queue that had formed itself before it appeared to have neither a beginning nor an end—but only a middle! That the world and his wife—and his child—should turn up here so impressively was a tribute alike to the neat little show that had been got up, as to the wonders of electricity.

The replica of the Mettur Dam was true to the original; so were the generating stations, etc. The Dept. deserves full marks for a neatly done piece of job.

In Memorium

Bapu, you didn't die,
It's a modern lie
Of the radio
And the Press.
Death is for us
And all the fuss...
But, how can you
Of the gods' WHO'S WHO?

Ah, then, we fondly hope...
This is a new dope.
Yes, you did die
And we lie,
But dying, you live for ever
And living-yet-we live never.

P. Parthasarathy.

*Strictly
Personnel*

INDEPENDENCE DAY ANNIVERSARY:

Momentous August 15...but the first anniversary of the Independence day was not celebrated by us with the *eclat* that should have normally accompanied it, because of the great tragedy that overtook the nation in the loss of its Father, Mahatma Gandhi. Of course, the Tricolour was flown from the quadrangle but solemnity was the key-note.

GANDHI MEMORIAL FUND:

A sum of Rs. 13,000—was contributed by the Corporation to the Gandhi Memorial Fund from out of its profits for 1947-48. In addition to this, a sum of Rs. 2,500/- was subscribed for by Staff. Remittances made to date total up to Rs. 1500.

GOVERNMENT OF INDIA TRAINING

SCHEME:

Under an arrangement with the Government of India, a scheme of free apprenticeship training for ex-service men has been undertaken by us with a view to their eventual absorption into the

service of the Corporation. At present, thirty-four ex-servicemen are under training. Trainees include line-men, mechanics and welders.

RICE DISTRIBUTION:

Staff in the Ramnad area, have for some time, now, been "in the soup" or rather out of it, because of acute local rice shortage. With the kind assistance of the Director of Civil Supplies, Government of Madras, rice supplies have been arranged for them—by procurement from the Tanjore District.

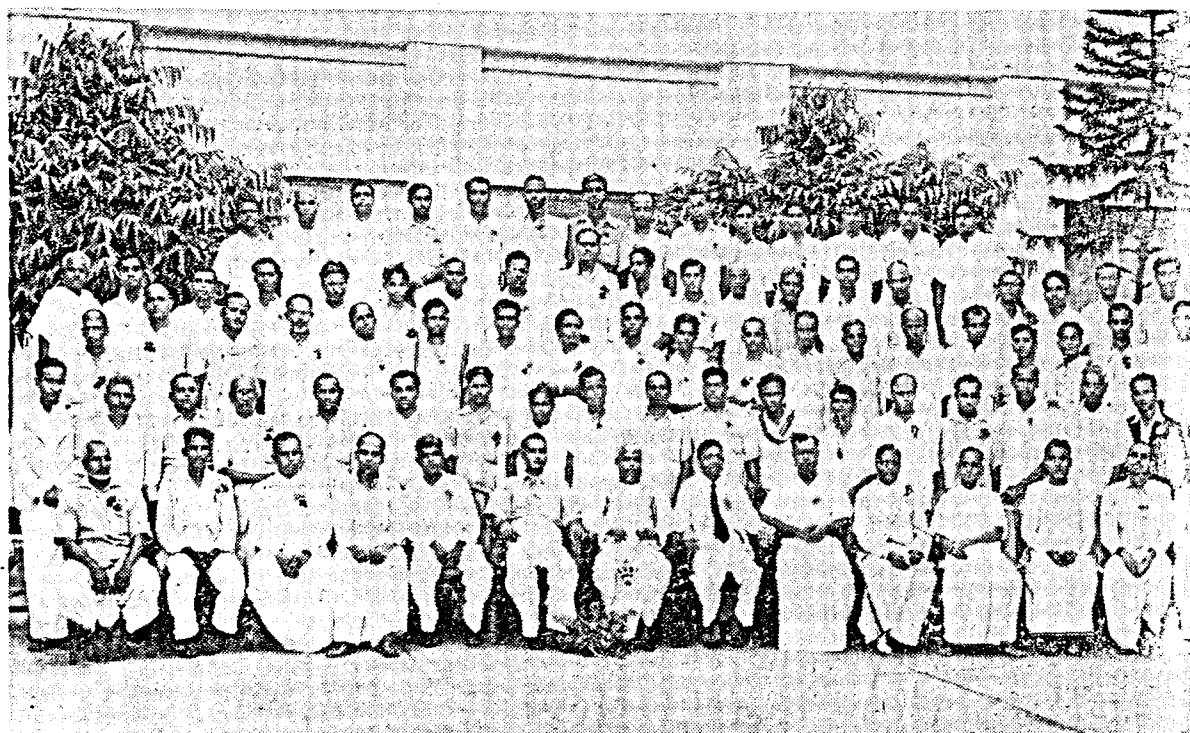
CO-OPERATIVE SOCIETY:

With the re-introduction of Rationing in Trichy from December 26, the Co-operative Society was once again put on its feet as a (Corpo-) RATION shop. The Society caters to the needs of both the staff and the public of the Tennur area. During *Deepavali*, it did a "roaring" business in textiles, most of the roaring, however, coming from unserved customers! We don't ration passion here!

CANTEEN :

Probably we are prejudiced, but "cawfee" will never taste the same for us elsewhere. So fine is the flavour of the coffee served at the canteen that, although there is no foundation in fact, for the rumour that the local branch of the India Coffee House are shortly closing down, it had better look to its laurels!

keep accounts indicated the artistic temperament. Measured by such yard stick, however, Mr. S. G. Krishna Iyer, Chief Accountant, who retired after a long and meritorious service of 25 years, was no artist—but still he *drew* lots and lots, for the Corporation. The number of cheques he has signed, if placed from



Centre : Sri S. G. Krishna Iyer ; Flanked on either side are Sri K. K. Raman and Sri Y. Seshasayee

We are no mere gluttons for work... and the tiffin provided here is both good and wholesome. As it is not, however, "manufactured" on a "cost plus basis," it does not make much of a hole in our pockets. Our *dhobies* take care of that!

AU REVOIR :

Somebody said that an inability to

end to end, will connect Quetta with Calcutta, and Srinagar with Virudhunagar!

Mr. S. G. Krishna Iyer was one of the courageous pioneers of the early, dark days of the Corporation. Stories are legion about his sense of devotion to duty, about his personal "sacrifices" for

the Corporation, etc., but as we wish to spare him embarrassment, we do not propose to retail, any, here. Friends got up a small party for him on the eve of his retirement on July 31, 1948. Several speakers paid warm tributes to the qualities of his head and heart, on the occasion... although in his case, it is a moot-point which is bigger! Those who spoke included, among others, Mr. V. Seshasayee.

We wish Mr. Krishna Iyer years and years of long life, prosperity and much well earned rest.

SOME GUY—THIS RAMANI :

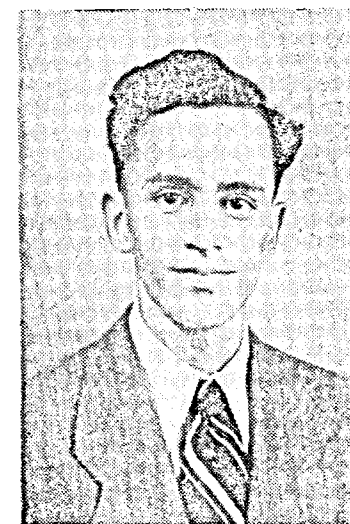
A company is known by the men it keeps is, probably, as good a modern version of an ancient saying as any, one can think of. This revision has, however, been prompted by the exceedingly fine record of our "ambassador" abroad—R. V. Ramani—who was recently back home, on a short vacation.

In the autumn of 1947, Ramani left for Europe and the States—on behalf of some of the concerns managed by Messrs. Seshasayee Bros. Ltd.—for (a) specialisation in the technique of Krebs mercury cells for the manufacture of high (Rayon) grade caustic soda and (b) for studying problems relating to chlorine utilisation. And now what he does not know about (a) and (b) can be written on the reverse of a half-anna postage stamp!

A spell-binder all right (*see cut*—as the American TIME would put it) Ramani is essentially the kind who likes to take off his coat—indeed he was seldom seen with one on here—and get down to it. "Concentrate all effort on the job in hand, everything else takes only a back

seat in the business band-wagon" would about sum up his philosophy of life.

A linguist of no mean ability, Ramani can speak broken French as elegantly to a lady as he can—broken-hearted Malayalam to the West Coast washerman who shrinks his Sulka shirts guaranteed to retain their New Look!

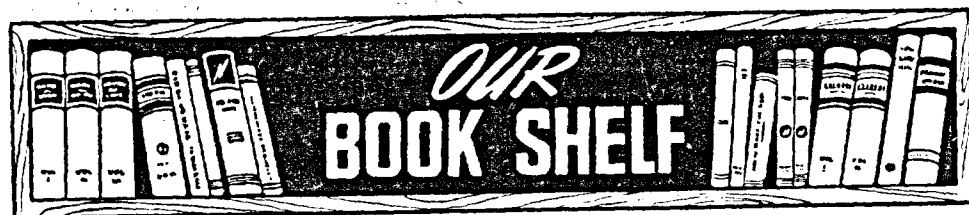


R. V. RAMANI

One of these days columnist Westbrook Pegler would splash a story in Hearst's New York *Journal American* under the head: "The small-town boy from the East who made the grade in the West" or something like that. Watch out!

Ramani left for U. S. again on Jan. 20, to play a 'return' engagement in that country. After a brief stay in New York, he will be proceeding to Switzerland in the company of Mr. A. Brothman. Object: Erection of a plant for the manufacture of plexi-flax. Best of luck, Ramani.

—R. P.



ELECTRICAL ACCIDENTS—by Sri K. V. Karantha, M. A., M. I. E., Chief Electrical Inspector to the Government of Madras. (Harsha Printing and Publications, Puthur, S. Kanara: Price Rs. 3/8/-.)

Mr. Karantha's new book, will be welcomed by the Electrical Engineer, either in charge of an industrial plant or a utility undertaking.

Although electricity is being rapidly extended to rural areas, consumer installations as well as the distributory mains of a utility are generally entrusted to semi-skilled workers, not fully conversant with safety regulations. It is, therefore, necessary that such persons should be educated in the safe use of electricity—if accidents are to be reduced to the barest minimum—and the use of electricity popularised in the vast rural areas.

The book under review describes the various types of electrical accidents common to both domestic and industrial installations, as also those ordinarily occurring on transmission lines, with examples collected by the author, as Chief Electrical Inspector, from the returns submitted to him.

THIRTY FOUR

Chapters VIII and IX describe, in the main, the precautions to be taken in preventing accidents. Stress is rightly laid by the author on the "earthing" of metallic circuits. Equal stress is laid by him on the proper authorisation of workmen to work on lines, and on the correct maintenance of records of "Line Clear", "Work Done" etc.,

For accidents to be avoided a sense of discipline must first and foremost, prevail both amongst workers and engineers according to the author and all reasonable safeguards taken.

The majority of accidents could be ascribed to negligence, neglect of instructions and violation of procedure on account of an exaggerated sense of "cock-sureness". In most cases, if not all, they are preventible and a book like this one, therefore, not only deserves to be read, but marked and inwardly digested.

This reviewer would, however, suggest to the author that he bring out an abridged edition of the book, containing just enough "safety notes"—both in Tamil and in Telugu for the guidance of workmen.

Barring a few typographical errors, the book is well got-up and adequately illustrated, and the author deserves the warmest congratulations of all concerned for an extremely useful publication which bears on every page, the impress of much careful study and more painstaking research.

OUR INDUSTRIAL PROBLEM—by K. V. Karantha (The Harsha Printing and Publications, Puthur, S. Kanara, Price Rs. 1/8/-.)

In this monograph, Mr. Karantha views the industrial problem of the country through the "field-glasses" of an engineer. The concentration of industries in the bigger cities of India, according to the author, has accentuated on the one hand, problems of unemployment housing shortage, labour unrest and other social evils—the logical corollary to the cramping of large numbers of people in small areas; on the other, rural populations who form the bulk of India's people have remained as poor as ever—with hardly any chance of getting amenities like electricity, good roads, etc.,

A solution to India's problems according to Mr. Karantha, would lie, for the most part, in the decentralisation of industries and in the location of industries in the villages. He suggests, for instance, that spinning units in the textile industry be fixed at a maximum of 2,000 spindles and be distributed over

villages, instead of being massed as, at present, in large factories. It is hardly surprising that this suggestion of the author, should have been greeted with a chorus of disapproval by Big Business. The idea of dis-integration was distasteful to many; costs and foreign competition were among the grounds urged against the proposal put forward by the author. But if, as is presumed, the well-being of the rural population is our national objective, a small increase in costs should not be the over-riding consideration for the rejection of the suggestion. In any case, it is a difficult question and deserves very careful study.

Similar suggestions have been mooted by the author for the sugar industry and a few other industries, such as rice-milling and oil-pressing. Decentralised industries, according to the author, distributed throughout the country, would not only take employment to the home, but would also enable people to get amenities like electricity and roads—because of the inherent potential of such industries.

According to Mr. Karantha, there is a case only for basic industries such as cement, heavy chemicals and defence industries—to be decided on geographical compulsions.

Mr. Karantha's monograph is extremely thought-provoking, and should help engineers and others throughout the country translate vague ideas into concrete terms.

THIRTY FIVE

SOME ASPECTS OF RURAL ELECTRIFICATION IN INDIA—

Being the third of a series of Pamphlets on subjects of general interest to the Electricity Supply Industry issued by the Central Electricity Commission, Simla. Price Rs. 1/6/-.

This pamphlet, as stated in the introduction, gives an account of the proceedings of a Symposium of the Society of Power Engineers, Simla, held there, on June 3, 1948, under the presidency of the Hon'ble Mr. N.V. Gadgil, Minister for Works, Mines and Power, Government of India.

Of late, the demand for electricity primarily for agricultural pumping and rural industries, has enormously increased. The supply engineer is at a loss to understand how he can meet this demand both on account of costs and on account of the non-availability of materials.

The proceedings of the symposium in which many prominent engineers have participated make, therefore, a welcome and valuable addition to the scanty literature available on rural electrification. As Mr. N. N. Iengar, one of the participants, sees it, the problem is essentially one of designing cheap lines, consistent with safety and satisfactory operation, if also of exploring the possibilities of using indigenous construction material for transmission lines. As load densities in rural areas are very poor Mr. Iengar suggests that medium-scale industries be distributed throughout

the countryside, as base loads, so as to make extensions economically feasible. According to him, indigenous agricultural loads are far too meagre in remotely situated villages and unless such base loads are shifted to the villages, it may not be possible to extend supplies to large parts of the country.

Mr. S. Swayambu, another participant, gives statistical data regarding costs of supply and the most economical tariff applicable to rural loads. He makes out a really good case for subsidies for rural extensions—which will eventually repay themselves from sales. It would be a rewarding thing for one to work out actual costs from existing rural distribution schemes, notably those in this Presidency, so as to have a working guide for future rural electrification schemes.

Mr. G. Sundaram gives, as his contribution, much useful information regarding the development programme of the Madras Government. He states that rural industries like rice-milling, oil-pressing and cotton-ginning have made it possible for electricity to travel to the villages. A believer in decentralisation and in the location of industries in villages, Mr. Sundaram lays particular emphasis on the need for subsidies for rural electrification programmes. He is, however, of the view that rural electrification cannot by its very nature be a paying proposition—were economical tariffs the underlying principle. The author is, therefore, sceptical about private capital coming forward for rural development.

This reviewer, however, feels that Mr. Sundaram is not being quite fair to private licensees, and that his conclusion is not precisely borne out by facts. For instance, the South Madras Electric Supply Corporation Ltd., the South Arcot Electric Distributors Co. Ltd., the Negapatam Electric Supply Co., Ltd., and the Kumbakonam Electric Supply Co. Ltd., practically distribute the bulk of power generated at Mettur and, have to their credit, excellent rural records. Indeed, if they have not been able to make as much headway as they normally should have, it is because of lack of materials, and the shortage of power in the Government generating stations. Also, the statements issued by Government spokesmen from time to time regarding nationalisation *vis-a-vis* private enterprise have had their effect in preventing capital from coming forward—so as to enable private licensees to push through their rural schemes. In the next issue of ELECTOLITE it is proposed to publish statistical data about the achievement of all these concerns, and it is hoped that the information will convince readers about the ability of

private licensees to do as well as Government, if not better.

Yet another contribution made to the symposium is by Mr. Venugopal who advocates the use of wood poles as a measure of economy. For one thing, these poles are difficult to get; for another, their probable life is doubtful. At any rate, the experience of the SMESC has been unfortunate. It is, however, necessary that we have more data on wood poles before we can decide on their adoption—so as to conserve steel for vital uses and purposes.

In the new set-up of Free India, there has been a shift in emphasis from the town to the village, and it is possible for electrical engineers to make much valuable contribution towards raising the standard of living of the people—particularly in the countryside. More symposiums of this kind should be held, as frequently as possible, as they will really help—as nothing else can, perhaps,—in the dissemination much valuable information based on actual experience.

H. K. R.

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எ ல க் டோ லை ட்

இதழ் 1.

தமிழ் பகுதி

மடல் 1.

அறிமுகம்...

இயற்கையின் மர்மங்களைக் குடைந்தெடுத்து மனிதன் சேர்த்த செல்வங்களிலெல்லாம் பெரும் செல்வமாகத் திகழ்வது மின்சாரம். மூங்கிற் புதற்களில்—காடு மலைகளில்—கற்பாறைகளில் பதுங்கியிருந்த—தீயைக் குடைந்தெடுத்துக் கம்பிகளில் வைத்துக் இழைத்துவிட்ட மனிதன் இன்று மின்சார சக்தியை ஆட்டிப் படைக்கிறான். வாழ்க்கையின் இன்றியமையாத சாதனமாகிவிட்ட மின்சார சக்தியை வேண்டியார் வேண்டியாங்கு எய்திப் பயன்பெறுமாறு தொண்டு செய்வதே லட்சியமாகக் கொண்டுள்ள எங்கள் ஸ்தாபனத்தின் குரலாக இந்த ஏடு மலர்கிறது.

இத்துறையில் முதலீடு செய்துள்ளோரும் இத்துறையில் இறங்கித் தொண்டு செய்வோரும் இதன் பயனைத் துய்த்து மரிமும் பொதுமக்களும் பரஸ்பரத் தொடர்புகொண்டு மின்சார வாழ்வில் மட்டற்ற பயன்காண உழைப்பதே இந்த இதழின் தலையாய நோக்கம். தங்கள் அனைவரின் கவனமும் ஆதரவும் இந்த நோக்கத்தின் வெற்றிக்கு அடிப்படை.

— ஆசிரியர்.

மந்திரவாதி வேலைக்காரன்

“ கு மு தி வி ”

அரபிக் கதைகளில் அலாடின் என்பவனின் கதை நம் எல்லாருக்கும் தெரிந்ததே. அவனிடம் ஒரு மந்திர மோதிரமும் விளக்கும் இருந்தது. அவைகளில் ஒன்றைத் தேய்த்தால் ஒரு பூதம் வரும். அது அலாடின சொல்லும் வேலைகளை எல்லாம் ஒரு கணப் பொழுதில், கண்மூடி கண் திறப்பதற்குள், செய்துவிட்டுப் போய்விடும்.

தற்காலத்தில் குடும்பப் பெண்மணிகள் வீட்டு வேலைகள் அபாரமாக ஏற்பட்டு இருப்பதைப் பார்த்து பிரமித்து, “ நமக்கும் நமது வீட்டு வேலைகளைச் செய்ய ஒரு ஜின் அல்லது பூதம் அகப்படாதா ! ” என்று ஏங்குகிறார்கள்.

முன்னாட்களில் வாழ்க்கை சுலபமாக இருந்தது. காலம் மெதுவாகச் சென்று கொண்டு இருந்தது. காலையில் ஒரு குடும்பப் பெண் எழுந்திருந்தால் வாசல் பெருக்கி, தண்ணீர் தெளித்து, கோலமிட்டு, பாத்திரம் துலக்கி விட்டு, எட்டு மணிக்குக் குழந்தைகளுக்குப் பழையது போடுவாள். பிறகு தான் ஸ்நானம் செய்து சாவகாசமாகச் சமைப்பாள். பிற்பகல் ஒரு மணிக்கு போஜனம் நடக்கும். அதற்கு மேல் சற்று களைப்பாரிவிட்டு, மளிகை சாமான்கள் தயாரிப்பது, அரிசி புடைப்பது, மா அரைப்பது இவைகளைச் செய்வார்கள். மாலை யில் வெங்கீர் வைத்து குழந்தைகளைக் குளிப்பாட்டி, இறுகத்தலையைச்சீவி கட்டுவார்கள். அவ்விதம் இழைய வாரிப் பின்னும் ஜடை

கலையாமல் அச்சில் வைக்கப்பட்டது போலவும் மூன்று தினத்திற்கு உதவும். பிற்பகல் சமைத்ததில் எஞ்சியதை வைத்துக்கொண்டு, அத்துடன் ஒன்று சமைத்து இரவு உண்பார்கள். அக்கம் பக்கத்தாருடன் பேசவும், பழகவும், அவர்களுக்கு உதவி செய்யவும் அவர்கள் இருக்கும். அமாவாசை, ஏகாதசி இம்மாதிரி விசேஷ தினங்களில் பக்ஷணம் பலகாரம் செய்வார்கள். அது ஒரு விசேஷமாகக் குழந்தைகளுக்கு இருக்கும்.

தற்காலத்தில் வாழ்க்கை துரிதமாகி, வேலை நிறைந்ததாகி விட்டது. ஒவ்வொரு குடும்பப் பெண்மணியும் தனக்கு ஏற்பட்டிருக்கும் அபார வேலையைக் கண்டு நிணரும்படி இருக்கிறது.

காலே எழுந்தவுடன் வீட்டோர் எல்லாரும் காபி கேட்கிறார்கள். காபி தயாரிப்பதா, வாசலில் கோலமிடுவதா? அடுப்பு பற்றுவதற்கே அரைமணி ஆகிறதே ! ஒன்பதரை மணிக்குள் குழந்தைகள் சுடுகையாகப் போஜனம் செய்து ஸ்கூல் போகவேண்டும். கணவன் ஆபீஸ் போகவேண்டும். குழந்தைகள் காலையிலேயே குளிக்கவேண்டும், வெள்ளுப்பு சட்டைகள் வேண்டும் என்கிறார்கள். ரிப்பன் எடுத்துக்கொண்டு வந்து கொடுத்து “ லாசா ” தலை பின்னிலிடு என்கிறார்கள். அவ்விதம் “ லாசா ” பின்னினால் தினம் மூன்று முறை பின்னவேண்டி இருக்கிறது.

பிற்பகலில் தினமும் டிபன், பசுணம், காபி செய்யவேண்டியிருக்கிறது. துணிகளெல்லாம் சவுக்காரம் போட்டு துவைத்தாக வேண்டும். முன்பு வேஷ்டியும், சிற்றூடையும் உடுத்தினை குழந்தைகள் இப்போது நீஜர், ஷர்டு, பாஜா மா, பாவாடை, பிராக் என்று விதம் விதமாகக் கேட்கிறார்கள். எல்லா வகையிலும் தைத்துக் கொடுக்கவேண்டியிருக்கிறது. இரவு மறுபடி சமையல். இடையில் வீடு முழுவதும் தட்டித் துடைத்து சுத்தம் செய்யவேண்டும். பிற ருடன் பழக தற்காலம் ஏற்பட்டிருக்கும் கிளட், சங்கம், சினிமா இவைகளுக்கும் போக அவகாசம் ஏற்படுத்திக்கொள்ளவேண்டும்.

உதவிக்கு வேலையாள் கிடைப்பது மிகவும் கஷ்டமாக இருக்கிறது. அத்துடன் அவர் களுடைய கோபம், ஜூரம், உறவினர் மரித்து துக்கம் விஜாரிக்கப் போவது ஆகிய எல்லா வற்றையும் நாம் பொறுத்துக்கொள்ளவேண்டி இருக்கிறது. அலாடினுக்குக்கிடைத்த ‘ஜின்’ மாதிரி நமக்கு ஒரு வேலையாள் அகப்பட மாட்டாளே!

நல்லது. நம்மிடையும் ஒரு அற்புத வேலை யாள் இருக்கிறான். அவனுடைய குணங்கள் அபாரம். அவைகளை வர்ணிக்க இயலாது. சொன்னதும் உடனே கேட்பான். துள்ளி எழுந்து வேலை செய்வான். ஓசை செய்ய மாட்டான். குப்பை கூளம் ஏற்படுத்தமாட் டான். அவனுடைய சக்திக்கு அளவே இல்லை. யானை பலம், இரண்டு யானை பலம் கொண்டும் நாம் இடுகிற வேலையைச் செய்வான். அவனுடைய திறமைக்கு எல்லையிலலை. எவ்வளவு நுணுக்கமான வேலையாக இருந் தாலும் செய்வான். எதிர்த்து சண்டை யிடமாட்டான். தண்ணீர் இறைப்பான், வீடு பெருக்குவான், வெந்நீர் வைப்பான், நினைத்ததும் காபி போட்டுக் கொடுப்பான், நினைத்ததும் அழகுமுழந்தைக்கு பால் சுட

வைத்துக் கொடுப்பான், சமைப்பான், தையல் வேலை செய்வான், வீடு முழுவதும் பளிச் சென்று அழகாக விளக்கேற்றி வைப்பான், வெயிற்காலத்தில் சுகமாகக் காற்றடிக்கச் செய்வான், குளிர்காலத்தில் உஷ்ணமான கணப்பு ஏற்றுவான். அற்புத ஆகாரங்களை தயாரிப்பான். காய்கறி அழகாமல் காப்பாற்று வான். எத்துணையோ மைல்களுக்கு அப்பால் நடக்கும் செய்திகளெல்லாம் நமக்கு உடனே வந்து சொல்லுவான், உயர்ந்த பாட்டுக்களை கேட்கச் செய்வான், பிரசங்கங்களைக் கேட்கச் செய்வான், மோட்டார் ஓட்டுவான், ரயில் விடுவான், கப்பல் விடுவான்...உண்மையில் அவன் குணங்களை வர்ணிக்க இயலாது.

இந்த வேலைக்காரனின் பெயர் “மின்சாரம்” என்பதை நீங்கள் ஊகித்திருப்பீர்கள். ஆனால் அவனிடத்தில் மரியாதையாக, கௌரவமாகப் பழகவேண்டும். இக்காலத்தில் தொழிலாளி களிடத்தில் எப்படி தொடர்பு வைத்திருக்கிறோமா அப்படி—பண்டைக்காலத்தில் அடிமைகளை நடத்தினாற்போல் அல்ல.

மின்சாரத்தின் சக்தி எல்லையற்றது. அதன் குணங்களை நாம் சீக்கிரத்தில் கற்கக்கூடும். அதைக் கற்று இந்த சக்தியை நமது வீட்டில் நமக்குக் கணக்கற்ற வேலைகளைச் செய்யச் சொல்லக்கூடும். ஆனால் தற்சமயம் நாம் நமது வீடுகளில் விளக்கு ஏற்றவும், பங்கா சுற்றவுமே அதை உபயோகிக்கிறோம்.

மேல் நாடுகளில் உபயோகிக்கப்படுகின்ற மின்சார அடுப்பும், மின்சார துடைப்பமும் நமக்கு அவ்வளவு ஏற்றவை அல்ல. நாமே நமது இந்திய வீடுகளுக்கு ஏற்றவைகளான மின்சாரக் கருவிகளை இந்தியாவிலேயே செய்து கொள்ளவேண்டும். அவ்விதம் செய்து கொள்வதற்கு பெண்கள் அதிகம் உதவவேண் டும். மின்சாரத்தை யந்திரங்களின் மூலம்

உண்டாக்குபவர் புருஷர்களாக இருப்பினும், அதை உபயோகிப்பவர்கள் பெரும்பாலும் பெண்களே. வீட்டில் விளக்கு ஏற்றுவதும் பங்கா சுற்ற-வைப்பதும், தண்ணீர் வசதிகளை கவனிப்பதும் பெண்களே. மின்சாரத்தின் உதவி பெண்களுக்குத்தான் அதிகம் வேண்டும். ஆகையால் பெண்கள் மின்சாரத்தின் குணங் களைப்பற்றி கற்றுத்தெரிந்துகொண்டு, தத்தம் வீட்டிற்கு வேண்டிய மின்சாரக் கருவிகளை உண்டாக்கிக்கொடுக்குமாறு மின்சாரக் கருவி உற்பத்தியாளர்களைக் கேட்கவேண்டும். அவ் விதம் கேட்டாலே அவைகள் உண்டாக்கப் படும்.

மின்சாரத்தை “ஜின்” அல்லது பூதத் திற்கு ஒப்பிட்டேன். ஒரு விதத்தில் அதை பிரம்ம ராக்ஷஸ் என்று கூடச் சொல்லலாம். “வேலை சரியாக இடாவிட்டால் உன்னை விழுங்கி விடுவேன்.” என்று கூறியதாக

நமது புராதனக் கதைகளில் வரும் பிரம்ம ராக்ஷஸ் போலவும், நாம் ஏமாறி, அசட்டுத் தனமாக இருந்தால் மின்சாரம் நம்மைக் கொன்று விடும். ஆனால் தற்காலத்தில் அவ் வித அபாயம் ஏற்படாமல் இருக்க அநேக பாதுகாப்புகள் இருக்கின்றன. அவைகளைக் கற்புது மிகவும் எளிது. அவைகளைக் கற்றால் நாம் மின்சாரத்தை அடக்கி நம் வழியே வேலை செய்யச் சொல்லக்கூடும்.

அபூர்வ சக்திவாய்ந்த மின்சாரம் என்னும் வேலையாள், இந்தியாவில் ஒவ்வொரு கிராமத் திற்கும், ஒவ்வொரு வீட்டிற்கும் தேவை. ஆனால் தேவைக்குத் தகுந்த அளவோ “ஸ்பீளை” இல்லை. இன்னும் சொற்ப ஆண்டு களிலேயே இந்தக் குறை தீர்ந்து, நமது கிராமங்களின் எதிர்காலம் முன்னேவிடப் பன்மடங்கு “பளிச்செழிற்சிக்கும்” என்ப தில் ஐயமில்லை.

காந்திஜிக்கு ராமநாமத்தில் நம்பிக்கை!

வியாபாரிக்கு

காரைக்குடி பாஸ்கரன் பிரஸில்

நம்பிக்கை!

ஏன்?

கூலி நிதானம், குறித்த நேரம், புதிய எழுத்துக்கள், நவீன மைகள்,

25 வருஷ அனுபவம், சிறந்த கவனிப்பு.

இரண்டாயிரம் வருஷங்களுக்கு முன்

சம்பளத் திட்டம்

(ஸாகித்ய சிரோமணி பார்த்த ஸாரதி அய்யங்கார்)

நாடாளும் துட்பமெல்லாம் அந்த சாஸ்திரம் என்னும் நூலில் விவரிக்கப்பட்டுள்ளது. இது ஒரு அரசியல் நூல். ரிஷிகளும் தேவர்களும் எல்லா சாஸ்திரத்திலும்போல அர்த்தசாஸ்திரத்திலும் பல நூல்கள் எழுதினார்கள். இவற்றுள் சுக்ர ரீதியும் சாணக்யனுடைய அர்த்தசாஸ்திரமும் சிறந்த நூல்கள். சாணக்யனுடைய நூல் 2000 வருஷத்துக்கு முற்பட்டதென்றும், சுக்ர ரீதி நூதனமென்றும் தெரிகிறது. சுக்ர ரீதி என்று இப்போதுள்ள நூல் நூதனமாயிருந்தாலும், அது கூறும் (சாணக்யனுக்கும் முற்பட்ட) சுக்ராசார்யருடைய ரீதி நெறி மிகப் புராதனமானது. எல்லாருக்கும் ஜீவாதாரமாயுள்ள சம்பளத் திட்டத்தைப்பற்றி சுக்ர ரீதியிலிருந்து சற்று ஆராய்வோம்.

[இரண்டாம் அத்தியாயம்-392வது சுலோகம் முதல்]

“நேரத்தின்பேரிலும், வேலையின்பேரிலும், நேரம்—வேலை இரண்டின்பேரிலும், ஆக மூன்று விதமாகக் கூலி கொடுப்பதுண்டு. எப்படிப் பேச்சோ அப்படியே கொடுத்தாக வேண்டும். இன்ன சமையை இன்ன இடத்தில் சேர்க்க இவ்வளவு கூலி என்பது வேலையின்பேரிலான கூலி. வருஷத்துக்கு வருஷம், மாதத்துக்கு மாதம், அல்லது நாளுக்கு நாள்

இவ்வளவு சம்பளம் என்பது காலக் கணக்கு. இத்தனை நேரத்தில் இத்தனை வேலை செய்தால் இத்தனை கூலி என்பது வேலையும் வேலையும் சேர்த்த கூலி. கூலி சம்பளம் முதலியவற்றைக் குறைக்கவும் தாமதிக்கவும் கூடாது.

“நாம் கொடுக்கும்கூலி வேலைக்காரனுடைய குடும்பத்துக்குப் போதுமானதாயிருக்கவேண்டும். மாம்ஸ போஜனத்துக்கும், மதுபானத்துக்கும், தீச்செயல்களுக்கும் மிஞ்சும்படியாக சம்பளம் கொடுக்கக்கூடாது.

“மெதுவாகச் செய்கிறவன், வேகமாகச் செய்கிறவன், மத்யமமாகச் செய்கிறவன்—என்று வேலைக்காரர்களில் மூன்று விதம். அவரவர்களுடைய வேலைத்திறத்துக்குத் தக்க படி சம்பளம் கொடுக்கவேண்டியது.

“கூலிவேலைக்காரன் தன் வீட்டு வேலையை கவனிப்பதற்காக பகலில் சாமப்போதும் இரவில் மூன்று சாமமும் அவனுக்கு ஓய்வு கொடுக்கவேண்டும். சாமம் என்பது மூன்று மணி நேரம். இந்தக் கணக்கின்படி பகலில் 9 மணி நேரமும் இரவில் 3 மணி நேரமும் வேலை. நாள் கூலிக்கு வருகிறவனை வேலையை ஆரம்பித்து முடிக்கும் நேரத்துக்குள் இடையில் அரைச்சாமம்—ஒன்றரை மணி

நேரம்—விடவேண்டியது. கூலியாட்களுக்கு உத்ஸவ தினங்களில் விடுமுறை அவசியமில்லை. அவரவர்கள் பண்ணும் சிரார்த்தத் தன்று விடுமுறை அவசியம்.

“வேலைக்காரன் நோய்ப்பட்டிருந்தால் முன்றுமாதகாலம் முக்கால் சம்பளம் கொடுக்க வேண்டியது. அஞ்சு வருஷமாக வேலை பார்க்கிறவன் நோயாளியாகி வேலைக்கு வர முடியாமல் கிடந்தால் ஆறு மாதம் வரையில் அவனுக்குச் சம்பளம் கொடுக்கலாம். அதற்குமேல் நோய் நீடித்தால் சம்பளம் இல்லை. உடல் நலம் இல்லாமைக்கு ஒரு வாரம் வரையில் சம்பளம் பிடிக்கக் கூடாது. குணசாலியான வேலைக்காரன் வியாதியால் வேலையைவிட நேர்தால் அவன் உயிரோடிருக்கும் வரையில் அவனுக்கு அரைச் சம்பளம் கொடுக்கவேண்டும், வேலைத்திற முள்ள அவனுடைய மகனுக்கு அந்த வேலையைக் கொடுத்து, வேலைப்பருவத்திலில்லாச் சிறு மகனுக்கும், மணமாகாத மகனுக்கும் கற்புடைய மனைவிக்கும் அவனுடைய சம்பளத்தில் பாதியாவது கொடுத்து உதவவேண்டும்.

“ஒரு வேலைக்காரன் ஒரு வருஷத்துக்கு மேல் நோயாளியாயிருந்தால் அவன் தனக்காக வேறொருவனைத் தன் வேலைக்கு அனுப்பலாம்.

“ஒவ்வொரு வேலைக்காரனுக்கும் வருஷத்துக்கொருமுறை மாதச் சம்பளத்தில் எட்டிலொரு பங்கு உயர்த்தவேண்டும். அல்லது வருஷச் சம்பளத்தில் எட்டிலொரு பங்கு வெகு மதியாகக் கொடுக்கவேண்டியது. வேலையை விரைவாயும் அதிகமாயும் செய்து முடிக்கிறவனுக்கு அந்த வேலையின் லாபத்தில் எட்டிலொருபாகம் கிடைக்கவேண்டியது.

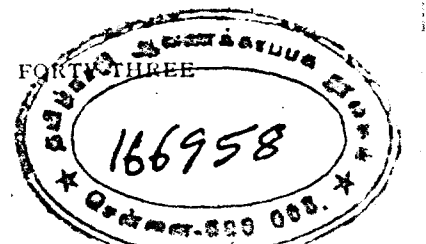
“வேலைக்காரர்களுக்கு வருஷத்தில் பதினேந்து நாள் சம்பளத்தோடு விடுமுறை

கொடுக்கவேண்டும். இருபத்திரான்கு வருஷம் வேலை செய்தவனுக்கு வேலையை நிறுத்தி அரைச்சம்பளம் கொடுக்கத்தக்கது.

“வேலைக்காரனுக்கு வேலையின் இடையில் தூர் மரணம் நேர்தால் சிறு பிள்ளையாயிருக்கும் மகன் பெரியவனாகும் வரையில் தகப்பனுடைய சம்பளத்தைப்பெறக்கடவன். அவன் பெரியவனான பிறகு அவனுடைய குண சாமர்த்தியங்களுக்கேற்ப அவனுக்கு வேலை கொடுக்கவேண்டியது.

“ஒவ்வொரு வேலைக்காரனுடைய சம்பளத்தில் நாலிலொரு பங்காவது ஆறிலொரு பங்காவது பிடித்து வைத்துச் சேர்த்து மொத்தமாகி இரண்டு மூன்று வருஷத்துக் கொரு தரம் அந்தத் தொகையில் பாதியாவது முழுவதையுமாவது அவனுக்குக் கொடுத்து உதவவேண்டும்.

“வேலைக்காரர்களுக்கு அவரவர்களுடைய வேலையைத் தெரிவிக்கும் உடையும் தலைப்பாவும் அவசியம். சிலருக்குச் சில அடையாளங்களும் தேவை. அந்த அடையாளங்கள் இரும்பு, பித்தளை, தாம்பிரம், வெள்ளி, தங்கம், இரத்தினம் இவற்றால் இருக்கத் தக்கவை. அதில் அவரவர்களின் வேலையை எழுதி ராஜமுத்தரையும் இருக்கவேண்டியது. உடையும் தலைப்பாகையும் தூரத்திலேயே இன்ன வேலைக்காரன், இன்ன அதிகாரி என்று காட்டுப்படியாயிருக்கவேண்டியது. இரும்பு முதல் வெள்ளி வரையிலுள்ள அடையாளங்கள் வேலைக்காரர்களுக்கு வில்லையாயும், தங்கம் இரத்தினங்களானவை பரிசுப் பதக்கமாயும் அதிகாரிகளுக்கு ஆபரணங்களாயிருக்கும்.”



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