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ALIND

Chronicle

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Messages...

Here are excerpts from messages received on the occasion of the signing of a four-year agreement by the company with its employees.

New Delhi.

I congratulate the Aluminium Industries Limited, Kundara, and its various workers' unions on successfully negotiating a comprehensive agreement. There can never be a better basis for industrial relations than agreement freely entered into and honestly observed.

... I am happy to find that different Unions in this concern have been wise enough to forget their differences and negotiate with the management from a position of strength which unity always gives. I hope with all my heart that this good example will be followed in other industries and in other parts of the country.

GULZARILAL NANDA,
Union Minister for Labour.

Trivandrum.

I wholeheartedly welcome the agreement recently entered into by the management and workers of the Aluminium Industries Limited.

... A guarantee of industrial peace is absolutely necessary for starting new industries and for the proper functioning and growth of existing industries. ... it is the prime duty of all concerned to formulate such agreements.

E. M. S. NAMBUDRIPAD,
*Chief Minister,
Kerala.*

Trivandrum.

I have no doubt that this agreement would augur well for peace in your industry for a long time to come. Your management, workers and their Unions have every reason to feel proud of this achievement. I take this occasion to offer my sincere congratulations to them...

I sincerely hope that other industrial managements will follow your lead and establish industrial peace and prosperity for the common good of our country.

T. V. THOMAS,
*Minister for Transport and Labour,
Kerala.*

... The agreement arrived at between the management and labour is an example worthy of emulation by managements and labour of other industrial units in the State. I see in the agreement an attempt to work out a formula by which the rights of industry and labour are safeguarded to the satisfaction of both, and industrial peace ensured. The noteworthy feature of the agreement on which labour deserves congratulations is that as many as six organisations representing labour and owing allegiance to different central organisations could agree to a common negotiating body.

I congratulate both management and labour on the patient and responsible way they have worked out this agreement.

K. P. GOPALAN,
*Minister for Industries,
Kerala.*

* * * *

... Without attempting to critically evaluate the several provisions spelled out in the agreement, I may unhesitatingly express my conviction that there is a spirit of goodwill and co-operation permeating the whole agreement. In an establishment with more than one Union with entrenched ideological differences, it is really an achievement to have brought about accord in respect of the multi-faceted problems affecting industrial relations. On the face of it, as I can see, the agreement restores to the workers a sense of belonging, and seeks to achieve higher production by reviving their interest and initiative and also by creating a better climate of human relations.

A. KUNJUKRISHNA PILLAI,
*Labour Commissioner,
Kerala.*

* * * *

Tiruchirapalli.

The prosperity and progress of ALIND will ensure the prosperity of the workers and I hope with the spirit of co-operation and understanding underlying this agreement, this prosperity will grow even more in the years to come.

Let everyone, be he of 'Labour' or 'Management' think mainly of his duty and obligations under the agreement, both in letter and spirit, and wholeheartedly discharge them. This is the *dharmic* way. Then everybody and ALIND will be happy and prosperous.

V. SESHASAYEE,
*Managing Director,
Seshasayee Bros. (Private) Ltd.*



JANUARY 1958

Editor : R. PARTHASARATHY

THE PURPOSES OF THIS PUBLICATION ARE:—

- (i) *To record the accomplishments and achievements of our employees, their joys and sorrows, so that our other friends like our customers, shareholders and neighbours may get to know our family better ;*
- (ii) *To encourage in our employees pride in workmanship and the high quality of our products ;*
- (iii) *To help create and sustain amongst them a spirit of friendliness ; and*
- (iv) *To tell the story of our business and that of our customers and other friends so that mutual understanding and respect might be fostered.*



Sworn friends, fast allies

♦♦♦

ELSEWHERE IN THIS ISSUE, WE GIVE SOME OF the salient features of an agreement, that ALIND recently signed with its employees, but to read it as a cold, legal contract would be not to get quite into the spirit of the thing. The agreement is, essentially, a human document, based on mutual respect and consideration by each of the two parties concerned for the viewpoints of the other. Most of the troubles of our modern world are often traceable to an inability to appreciate 'the other fellow's point of view' or what A.C. Benson, the well-known essayist, calls "the assured, the positive, the Pharisical temper that believes itself to be impregnable in the right and its opponents indubitably in the wrong."

Unless there is mutual appreciation of the problems of a company by its employees, and *vice versa*, unless there is free interchange of ideas between the two in all matters and company policies of mutual interest, such as wages, hours, conditions of employment, unless, in brief, there is agreement on all vital issues, not only are the two parties principally concerned likely to suffer, but, what is even worse, the customer and the community will also suffer.

For a company which has always pursued a progressive personnel policy, and which has always looked upon its employees as its sworn friends and fast allies, this 'signing along the dotted line' came with natural grace. Yes, the agreement is a bond... but a bond of mutual consideration and respect.

THE COVER: His Excellency the Bishop of Quilon Dr. Jerome Fernandes was the chief guest at the Christmas Party. Picture shows the Bishop addressing ALIND children on the occasion.

"IT WAS THE RESPONSIBILITY OF both society and Government to see that suitable conditions were generated and secured, whereby any individual who had a healthy mind, could, with his labour and talents, become happy. The desire of the Government was that such people were encouraged to be healthy and helped as far as possible," declared Mr. Morarji Desai, Union Minister for Commerce at the inauguration ceremony of the Transformer Division expansion of the Kirloskar Company which came off sometime ago.

The expansion programme of the Transformer Division of the Company envisages the raising of installed capacity from 75,000 kVA to 1,75,500 kVA per annum and this includes manufacture of transformers up to 5,000 kVA.

"**Technical Handbook**": To perpetuate the memory of the late Mr. G. Sundaram, Chief Engineer, Electricity Department, of the old composite State of Madras (1944 to 1952) and President for three successive years of the Government Electrical Engineers' Association, Madras, the Association brought out a "Technical Handbook." At an official function held on December 26, 1957, Sir C. P. Ramaswami Iyer, dedicated the book to the memory of Mr. Sundaram.

A veritable mine of information, the Handbook contains a wealth of engineering data and formulae. As Mr. V. G. G. Nayar observed in his letter of congratulations to Mr. L. R. Saptharishi, General Secretary "the book is easily the best and most comprehensive electrical handbook that has so far been published in this country."

Productivity drive: At a two-day seminar held in New Delhi in November 1957 and convened by the Ministry of Commerce and Industry to finalise a programme for

the National Productivity Movement in India, the Union Minister for Industry, Mr. Manubhai M. Shah called both upon industrialists and workers to be prepared to discard outmoded practices and attitudes, not in accord with a progressive and developing economy. Mr. Shah said: "We will have to educate, and sometimes re-educate, management as well as labour, in their responsibility towards each other and towards the country."

Continuing, Mr. Shah observed that in the competitive world economy of to-day, India could not afford to lag behind other countries in techniques and processes which reflected on the measure of national productivity. The increase of productivity would be a substantial contributing factor to the expansion of our economy, he added.

It was necessary, said the Minister, that a climate for productivity increase was created in the country and an urge for improved and efficient utilisation of resources instilled in each individual and organization. Employers and labour would have to collaborate mutually for achieving this objective, he concluded.

Heavy Electricals Private Ltd.: Heavy Electricals Private Ltd., a Government of India concern, have an ambitious programme of manufacture of several items. The following is a representative list:

(a) *A.C. Rotating Machinery* — (1) A.C. generators, water-wheel driven type, up to 50,000 kW capacity initially; (2) A.C. synchronous condensers up to 15,000 kVA; (3) A.C. generators for diesel sets up to 500 kW size initially; (4) A.C. industrial motors above 200 h.p.; (5) A.C. crane motors up to 100 h.p.

(b) *D.C. Rotating Machinery* — (1) D.C. traction motors up to 600 h.p.; (2) D.C. motor generator traction sets up to 30 h.p.; (3) D.C. generators and motors up to 5,000 kW; (4) D.C. crane motors up to 100 h.p.; (5) D.C. exciters for A.C. generators; (6) D.C. welding generators up to 10 kW.

(c) *Rectifiers* — (1) Rectifiers for railway electrification (stationary); (2) rectifiers for railway electrification (mounted on rolling stock); (3) industrial rectifiers.

(d) *Transformers* — (1) Power transformers of all voltages from 33 up to 220 kV; (2) voltage transformers; (3) current transformers; (4) A.C. welding transformers; (5) rectifier transformers; (6) arc suppression coils; (7) transformer type voltage regulators.

(e) *Switchgear* — (1) A.C. medium voltage (6.6-11 kV) metalclad oil circuit breakers, 100 and 250 mVA rupturing capacity; (2) A.C. metalclad isolators (6.6-11 kV); (3) A.C. outdoor 22/33 kV oil circuit breakers, 500 and 750 mVA rupturing capacity; (4) A.C. outdoor 66 kV oil circuit breakers, 3-tank, 750/1,000 mVA rupturing capacity; (5) A.C. outdoor 110/132 kV oil circuit breakers up to 5,000 mVA rupturing capacity; (6) 132 kV outdoor air-blast circuit breakers, 3,500/5,000 mVA rupturing capacity; (7) 220 kV outdoor air-blast circuit breakers, 5,000/7,500 mVA rupturing capacity; (8) 25 kV oil circuit breakers and air-blast circuit breakers for traction; (9) A.C. outdoor rural oil circuit breakers weight-reclosing type; (10) D.C. traction high speed circuit breakers, 1,500/3,000 volts; (11) D.C. panel-mounted circuit breakers; (12) control boards and control

desks ; (13) surge diverters of voltages up to 220 kV ; (14) traction control gear ; (15) industrial control gear.

(f) *Static Capacitors* -400 and 3,000 Volts.

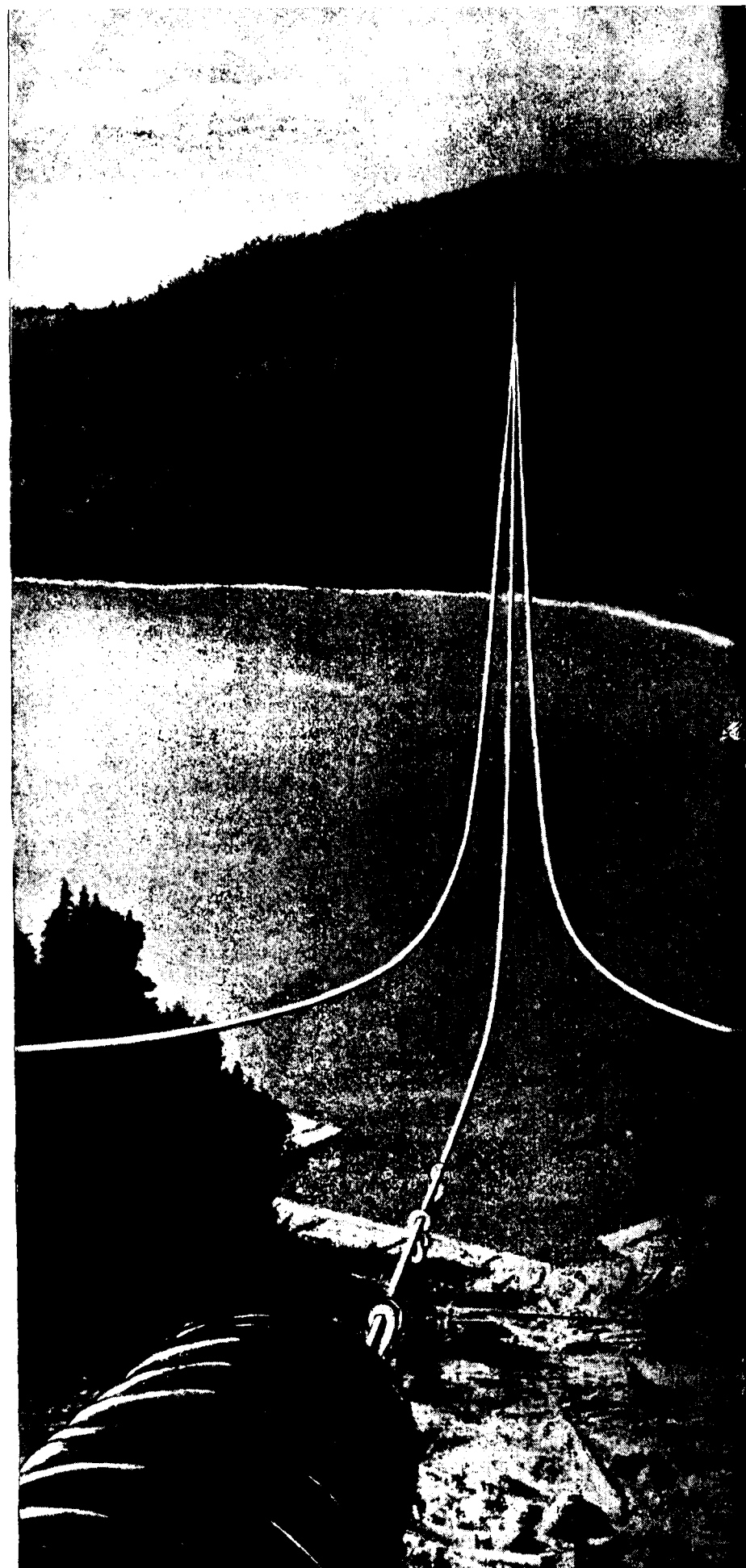
The factory will start initially with the manufacture of power transformers, voltage and current transformers, A.C. metal-clad switchgear, A.C. outdoor circuit breakers of all voltages, A.C. weight-reclosed rural type circuit breakers, industrial control gear, control boards, surge diverters and static capacitors. Other items will be added to the manufacturing programme at short intervals as more and more trained men become available.

An Alcan achievement : The longest span of ACSR in Canada, and possibly in North America, provides proof of how specially designed conductors (Alcan) can cut transmission line costs. The 6,300-foot span crosses the Agamemnon Channel on the British Columbia coast and is an important link in the British Columbia Electric Company's 138 kV line to the Powell River Company.

Crossings of this size present unique problems in tower and conductor design. Alcan's technical know-how shared in finding the solution. After careful study and detailed investigation, Alcan's Conductor Division offered a conductor that satisfied the unusual mechanical and electrical requirements involved.

By using this specially designed conductor, the British Columbia Electric Company was able to make substantial cost savings. These savings resulted from reduced conductor cost and less weight which permitted use of lighter towers. Alcan also designed dead-ends and vibration dampers, engineered to fit the special conductor, and provided engineering service in the field during erection.

This ACSR has 54 strands of aluminium laid over 37 strands of galvanized steel wire. The overall diameter of the cable is 1.023 in. and it weighs 1.30 lbs. per foot. The rated strength of the conductor is 51,200 lbs. ●



'Unijoint' for ACSR

New One Piece Sleeve Reduces Costs Greatly

A NEW TUBULAR COMPRESSION JOINT suitable for communication and distribution line work has been developed by the Aluminium Company of Canada, Ltd. and Aluminium Laboratories Limited. Called the 'Unijoint', since it comprises a single sleeve only, it can be used up to and including No. 4/0 AWG 6/1 ACSR size. The new principle also is applicable to dead ends, called 'Uniterms'.

Compared with former joining methods, the Unijoint is not only lower in first cost, but as the installation is greatly simplified, line erection costs also are substantially reduced. To make a joint, the two ends of the conductor are inserted into the sleeve, which is indented at the centre to eliminate measuring or guessing at the position of the joint. The sleeve is compressed with a mechanical hand tool, and the joint is complete.

Compound in Sleeve

The Unijoint is pre-filled with newly developed Unigrip jointing compound. This jointing compound greatly increases the friction between the sleeve, the conductor strands and the steel core wire, so that joints made with a single sleeve develop the rated ultimate strength of the conductor.

Prefilled sleeves are easier to handle, and the lineman does not have to carry a container of compound. Uniform application of the compound is assured, and the joint is automatically sealed after compression. Small plastic caps over the ends of the sleeve keep the compound in place before the sleeve is installed.

Joints and dead-ends made with the Unijoint and the Uniterm were tested extensively by Aluminium Laboratories Limited to determine the effect of temperature cycling and relaxation on the mechanical strength of the joints. Following 300 hours of temperature cycling, tensile tests

showed no noticeable loss of strength in the joints. Electrical resistance tests on the joints obtained satisfactory resistance ratios. The electrical resistance of a conductor joined with a Unijoint, before and after current cycling, is well below that of an equal length of unjointed conductor.

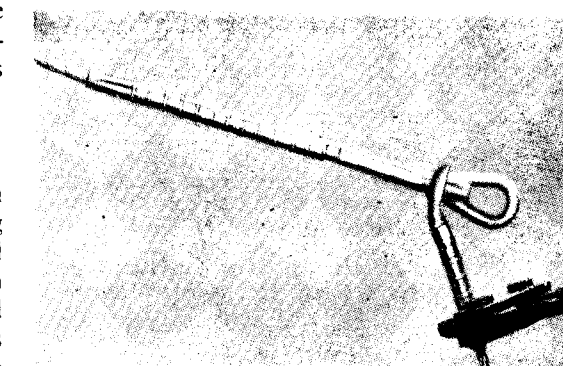
Previous Joining Methods

The previous method of joining two lengths of ACSR involved measuring and cutting back the aluminium strands, compressing a steel sleeve over the steel core wire, applying jointing compound, and finally compressing an aluminium sleeve over the entire assembly. These were tedious operations for small conductors, which have been

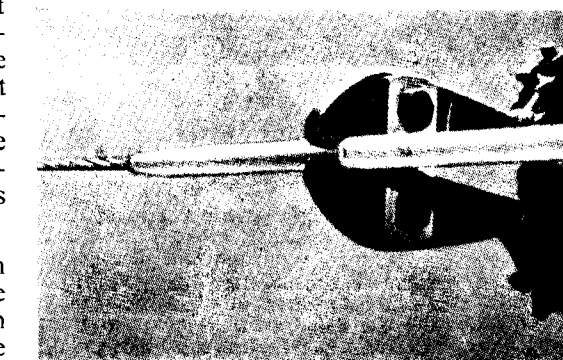
done away with largely by the Unijoint.

Since the introduction of the Unijoint and the Uniterm, Canadian National Telegraphs has accepted ACSR as a standard conductor for its communication lines, and many other companies are taking a fresh look at the advantages and economies of aluminium conductor for communication and distribution lines.

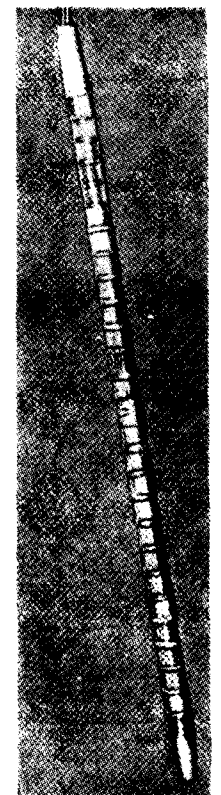
Anxious as we are to ensure the best technical performance of our aluminium conductors at a minimum cost to our customers, we have already well under way plans for the fabrication and marketing of these two simple, one-piece accessories—unijoints and uniterms.



The simple "Uniterm" deadend with jumper is quickly installed with a mechanical hand tool.



"Unijoint" tubular compression joint is seen before and after compression. Notice the indentation in the centre of the joint for easy positioning of the conductor.



Aluminium in Electrical Engineering

A symposium on ALUMINIUM IN ELECTRICAL ENGINEERING was held under the auspices of the Aluminium Development Association in London in May last. Its objects were: (a) to assess the position already attained by aluminium in electrical engineering; (b) to permit electrical engineers to give their experience in using aluminium; and (c) to provide a forum for discussion of present problems and future possibilities.

As the proceedings are bound to be of interest to Power Engineers in our own country, we make no apology for publishing this summarised version of the symposium.

At the first session, "General and Economic Considerations in Using Aluminium in Electrical Engineering", the following three preprinted papers were discussed:

Paper 1. *Economics of Aluminium in Electrical Engineering*, by F. G. West.

Dr. West (Technical Director of the Association) compared the production, use, present economics and trends of aluminium, copper, lead and zinc during recent years. Production of aluminium, which had been of commercial significance for only 70 years, was, he said, doubling every decade. Between 1930 and 1953, its increase of 300 per cent compared with 160 per cent for electricity general and 25 per cent for copper. Dr. West also said that in a typical case of stranded overhead conductors of 0.10 sq. in. copper equivalent, costs per mile based on prices of copper at £240 per ton and aluminium at £197 per ton were: copper £293; all-aluminium £144; ACSR £162 and aluminium alloy £204. For short lengths of conductor, aluminium would carry 10 per cent more current than copper. In insulated cables, the saving would be somewhat offset by the increased cost of insulation, since the diameter of the aluminium conductors was 1.25 times that of copper of equal resistance. Other properties of aluminium influencing its economic use included good corrosion resistance, and with the application of special surface treatments, such as anodic oxidation, it is able to withstand severe conditions.

The long-term supply of aluminium and its price stability were superior to those of the other non-ferrous metals concerned. For certain applications, copper might remain the most suitable conductor material, but the rate of increase in generating plant capacity was exceeding that of copper output. Similar considerations applied with even more force to substitution of aluminium for lead in cable sheathing.

Paper 2. *Aluminium and its Alloys in Electrical Engineering*, by C. H. E. Ridpath and D. F. J. Worth.

Tabulated comparisons between aluminium and its alternatives were set out in the paper of Mr. C. H. E. Ridpath (Aluminium Wire and Cable Co.) and Mr. D. F. J. Worth (Aluminium Development Association), who also particularised the relevant British Standards and referred to other physical properties of aluminium of electrical interest. These included affinity for oxygen, as shown by the oxide film (5-10-7 in. thick) which formed immediately on exposure to air; bimetallic corrosion through contact with

copper and its alloys and to a much lesser extent, mild steel in marine and industrial atmospheres, protection from which was obtainable by using magnesium sacrificial anodes; and low magnetic susceptibility with consequent elimination of hysteresis losses.

Paper 3. *Fundamentals of Jointing Processes for Aluminium*, by J. C. Bailey and P. Gregory.

On the subject to jointing Mr. J. C. Bailey (A.D.A.) and Mr. P. Gregory (British Insulated Callender's Cables) based their approach on processes that were applied to aluminium in non-electrical fields. These having been designed to match the special characteristics of aluminium would be more suitable than some modified version of processes initially developed for jointing copper with its different melting point and electrical resistivity. As a result the authors concluded that aluminium could be jointed at least as readily as copper and that aluminium sheaths were as readily jointed as lead sheaths.

A major difference between the two metals lay in the nature of their oxide films and the rate of their reformation after surface cleaning. The aluminium oxide film, adherent and non-conducting, reappeared immediately; the semi-conducting copper-oxide film was built up more gradually. Immediate application of moisture-free petroleum jelly in either case largely prevented film growth.

Aluminium oxide films were attacked by fluorides and chlorides which were therefore used in welding or soldering fluxes, and were dissolved by caustic alkalis. The process appeared to be largely mechanical and might be the reason why anodised aluminium surfaces could readily be jointed by cold pressure welding, which suggested new methods of attacking the problem. Brazing was equally suitable and bolting, clamping and soldering, as used with copper, could be successfully modified for aluminium.

A long and lively debate involving more than twenty speakers followed the introduction of these papers.

Opening the discussion, a major cable manufacturer said that for the sheathing of pressure cables, aluminium had a decided technical engineering advantage and an encouraging future if the price were reasonable, for its use was likely to extend considerably with the increased demand for electricity.

The next speaker confined his remarks to the subject of jointing. He emphasised the importance of combining jointing tech-

niques with thorough routine testing, and this elicited a description, by a member of one of the aluminium producing companies, of a chemical jointing compound which offered the electrical industry a simple and reliable method of producing stable low resistance joints in busbar installations. Unhappy experiences with hexagonal crimp terminations on aircraft cables were mentioned by a prominent member of the aircraft industry, but later speakers—including one from the Air Registration Board—thought that the difficulties encountered could be overcome. To support this contention, reference was made to many years successful use of crimp terminations in America and on overhead lines.

A most interesting contribution came from a Hungarian visitor who said that aluminium was being used to a considerable extent in place of copper in Hungary; it had proved satisfactory for both conductors and sheathing. This speaker also asked for information on the Properzi method of producing aluminium wire, and this was supplied by a visitor from Ireland who gave full details of the process and stated that he considered it particularly suitable for use in smaller countries owing to the relatively low capital cost.

Soldered and bolted connections were also discussed in some detail: a somewhat unusual complaint was that so many solder alloys were available that choice became difficult; bolted joints were, in general, approved, one speaker stating that his Company had been using them with great success for years—both aluminium to aluminium and aluminium to copper.

At the second session "Aluminium in Transmission and Distribution Lines" three papers were introduced:—

Paper 4. *Aluminium in High Voltage Transmission Lines*, by G. B. Jackson.

The application of aluminium and its alloys to the grid was described by Mr. G. B. Jackson (Central Electricity Authority) under the headings of transmission-line supports, conductors and conductor accessories. An example of the first was the top structure of a tower erected in 1954 for a double-circuit 132 kV line near Birmingham. The aluminium-alloy portion, extending to 16 feet below the bottom of cross-arm, weighed, 2,055 lbs. compared to 4,100 lbs. for mild steel. It remained to be seen whether this trial tower top would withstand corrosion in industrial atmospheres.

For ACSR three standard sizes of stranding were now employed. At 132 kV the line conductors were 37/110 in. and 61/125 in. and earth conductors were

19/110 in. and 37/110 in. for ratings of 90 and 145 mW respectively. At 275 kV the same pair of line conductor sizes in twin-bundle arrangement, rated at 375 and 575 mW, were adopted, but the earth conductor was 37/110 in. in both instances. Long spans, usually when crossing rivers were strung with ACSR except at Dagenham (Thames), but the requirement to give a traffic clearance of 200 to 250 ft. with spans exceeding 3,000 to 4,000 ft. such as those of the fourth and seventh crossings, necessitated the use of special conductors owing to the excessive tower height required.

Two experimental 37/110 in. conductors were at present undergoing trials in a 132 kV line near the coast. In one an extended aluminium sheath replaced the outer layer of strands and in the other it replaced the inner layer. The latter was found more flexible in handling, but the external type seemed superior in resistance to corrosion and vibration effects. In general, corrosion in industrial atmospheres attacked the outside surface overall and pitted the internal aluminium strands, whereas coastal corrosion was mainly due to electrolytic action between the steel core and inner aluminium strands. In such areas in Great Britain, the loss of mechanical strength of the complete conductor averaged from 0.4 to 0.5 per cent per annum, corresponding to a service life of 25 to 30 years. Special greases had proved effective in combating corrosion.

Paper 5. *Aluminium for Overhead Distribution Lines*, by R. Cloke and M. Fyfe.

That aluminium could be satisfactorily substituted for copper for overhead distribution lines up to 33 kV on wood poles was the experience of Mr. R. Cloke and Mr. M. Fyfe (Eastern Electricity Board). For low-voltage lines all-aluminium conductors had proved the most suitable. Availability on the British market of a reasonably-priced, hand-operated, hydraulic compression tool of small dimensions and low weight would add to the merits of aluminium. For high voltage lines to BS. 1320 construction with ACSR was cheaper, but a homogeneous alloy conductor had advantages which seemed to make it the better overall choice. ACSR was usually most suitable for heavier high-voltage lines, in which compression fittings were necessary for long-term satisfaction. Where very high tensile strength was required, as in replacement of existing steel conductors, steel-cored high tensile aluminium was found economical and greatly increased current-carrying capacity.

Paper 6. *Medium and Low Voltage Insulated Aluminium Conductored Cables for the Distribution of Electricity*, by G. E. Peirson.

This paper by Mr. Peirson of Midlands Electricity Board recounted the economic considerations which led in 1955 to the adoption of aluminium for medium and low-voltage insulated cables. Taking prices of aluminium at £165 and of copper at £250 to £400, the possible saving ranged from 4 to 22 per cent, and original plans to employ copper were changed. Copper-equivalent sizes did not generally give the best practical designs and existing

standard sizes for copper of 0.06 up to 0.3 sq. in. were retained in four-core cables. This necessitated redesign of networks to give the same voltage drop. Little financial advantage was shown by aluminium of 0.0225 sq. in. for which copper was still used.

In jointing, soft-soldering methods were the most practical, the chief difficulty being the self-oxidising of the aluminium. Conductors of straight-through joints were stepped and barbed for effective tinning of each strand, during which scrubbing by nylon brushes assisted removal of oxide films. Tin-lead-solder was standardised as metal and flux, the relatively low temperature of which reduced risk of charring of paper insulation. Probably, however, a mechanical compression joint developed by the Midlands Electricity Board for overhead aluminium conductors would displace soldering as at present used for underground cables. During the financial year 1955-56 savings from the use of aluminium reaches £170,000, with satisfactory performance of cables and joints.

General discussion was opened by another cable maker who suggested that soldering by inorganic reaction fluxes, for which solder composition was less critical, might have received more attention in Mr. Peirson's paper. This method had a long record of success on the Continent and called for no elaborate training or equipment. Another speaker thought the best method of connecting aluminium conductors was by compression: cable compression joints were being designed to meet the most stringent requirements of mechanical strength and electrical conductivity, and tools were now available. Jointing difficulties, this speaker concluded, would not limit the success of any aluminium project.

A visitor from Russia said that aluminium was widely used in the U.S.S.R. for transmission lines, switchgear, for house and factory wiring, and for L.V. and H.V. insulated cables.

A speaker then reminded the audience of the extensive use of aluminium and aluminium alloy conductors in Scotland: in recent months, 3,600 conductor miles had been erected, representing roughly 1,400 route miles.

Another interesting contribution came from an American visitor who stated that about 97 per cent of the transmission lines in the U.S.A., and approximately 70 per cent of insulated cables were of aluminium. In his opinion, all steel reinforcement in aluminium overhead lines would soon be aluminium dipped or coated, because—in general—performance had been superior to that of galvanised steel. A Hungarian speaker confirmed this.

The last contributor to the discussion, a member of the Central Electricity Authority, referred to the use of aluminium for outdoor H.V. substations and the attendant difficulties. He thought that more development work was both necessary and worthwhile.

In the third and final technical session, six papers were introduced.

Paper 7. *The use of Aluminium in the Construction of Transformers*, by F. W. Gee and M. J. Gresley.

Aluminium for transformers provided the subject of a paper by Mr. F. W. Gee and Mr. M. J. Gresley (Ferranti Limited), who pointed out that, in addition to the comparative costs of aluminium and copper, the cost of core steel and transformer losses had to be taken into account.

Paper 8. *Aluminium and Aluminium Alloy Busbars*, by A. R. Parish.

While the recent introduction of aluminium alloys with substantially improved mechanical properties had largely removed one obstacle to more extensive use of busbars, jointing was still widely regarded as a bogey. That this need not be so was shown by Mr. A. R. Parish (English Electric Co.) who described varied load-cycle and short-circuit tests on aluminium, both electrically pure and alloyed, and on copper. These indicated a substantial economic advantage from aluminium that was unaccompanied by any serious difficulties. Important factors in successful jointing were scratch brushing under grease and by using a British proprietary compound.

Paper 9. *Aluminium in Telecommunications Cables*, by R. C. Mildner and B. F. Thorne.

The most important future contribution of aluminium to telecommunications was envisaged by Mr. R. C. Mildner and Mr. B. F. Thorne (Telegraph Construction and Maintenance Co. as being in subscriber's distribution and other local cables, where protected from corrosion and where jointing problems had been solved in practice.

Paper 10. *Aluminium in the British Telephone Service*, by J. Gerrard and T. F. Urben.

In a review of the main uses of aluminium in the British telephone service, Mr. J. Gerrard and Mr. T. F. Urben (G.P.O.) said that it showed little advantage in overall cost for small-gauge-conductor cables for subscriber's circuits. In heavier trunk or junction cables it might be economical, despite the greater duct space demanded. It showed promise for sheaths screening cables against interference. In construction of equipment aluminium was extensively used for die-cast frames of complex form. The largest quantity of aluminium used was in spacing segments of contact assemblies, where the ability of the metal to flow under pressure enabled dimensional differences in contact and insulating segments to be accommodated.

Paper 11. *French Experience with Aluminium Conductors in Electrical Equipment*, by P. Jacomet.

Mr. P. Jacomet (Aluminium Français) recorded that since 1947 the price of copper had increased more rapidly than that of aluminium. Last January, the replacement of 2 kg. of bare copper by 1 kg. of aluminium effected a saving in cost of 63 per cent as against 13 per cent

in 1938. The author's conclusion was that aluminium was suitable for field windings and interpoles (but not for commutators and armatures) of DC machines and for stator and rotor windings of alternators.

Paper 12. *German Experience with Aluminium Conductors in Electrical Equipment*, by W. Von Zwehl.

In Germany, Mr. W. Von Zwehl (Aluminium Zentrale, Dusseldorf) reported, electrical uses accounted (in 1955) for about 16 per cent of the total consumption of aluminium. On the 400 kV grid, four ACSR were used per phase, but no compression joints. For cables at all distribution voltages, aluminium was widely used for conductors and sheathing. The direct endless extrusion method of sheathing was regarded as likely to predominate in the future.

In low voltage networks the aluminium sheath was used as the neutral, halving the cable cost compared to that of cable with four copper conductor and lead sheath. A British proprietary jointing compound recently developed was expected to provide an efficient and practical improvement for bolted joints of busbars. The high insulation resistance of anodic film had favoured the choice of aluminium for lifting magnet windings and brake coils. Service experience had shown the behaviour of normally insulated aluminium (introduced on account of copper shortage) to be equal to that of copper in the windings of motors and transformers.

A German visitor expressed the opinion that direct extrusion processes developed in the United Kingdom and Germany ought

to be the final solution for applying aluminium sheathing to cables. Both drawing down and welding he regarded as intermediary stages. A Swedish contributor was surprised that much more cast switch gear apparatus was not made of aluminium. His own firm had changed from cast iron to an aluminium silicon alloy, with considerable technical advantages. Another speaker thought it might be better to use what copper was available for the windings of apparatus such as oil immersed transformers and to use aluminium for busbars, risers, and switch connectors. Transformer manufacturers should gain all the experience they could with aluminium windings before some factor made it essential to give the matter more serious consideration.

A Hungarian visitor, referring particularly to the paper by Mildner and Thorne, said that the making of aluminium cable sheathing was a most important development but many problems remained to be solved. One Hungarian works claimed to have devised a new press which would give continuity of production, but he could give no more information about this at present.

Another speaker described an interesting use of aluminium wound Eccles transformer were separated by plates of 16 S. W. G. aluminium. These had been anodised and silicone varnished, thus giving the double advantage of electricity insulating the coils from one another and providing efficient cooling without the use of an air gap.

An engineer in the chemical industry, referring to the paper by Gee and Gresley, and also to that by Staley, listed a number of other advantages of using anodised

aluminium wire or strip for transformer windings, particularly when immersed in a liquid coolant recently developed by his Company and capable of withstanding temperature of 150 deg. C. He added that it was still difficult to obtain in this country suitably anodised aluminium wire or strip.

Another speaker urged greater co-operation between the aluminium industry and the electrical manufacturers, particularly in research.

The debate was appropriately wound up by a member of one of the leading electrical engineering companies who discussed the economics of the use of aluminium in distribution and in generator transformers. In the former, the design worked out for copper used the smallest amount of best quality steel and the substitution of aluminium would therefore require a larger frame size with increased overall cost. However, different conditions applied to generator transformers where iron losses were not so important; here it was possible to produce an economic design in aluminium.

All papers, and most speakers, inevitably referred to the economics of the substitution of aluminium for copper in electrical engineering. These references show with some certainty that, regardless of the amount of copper which remains to be extracted from the earth's crust, the long-term future for aluminium is increasingly favourable both in respect of supply and price. Copper, even with major technical developments in extraction, is unlikely to do more than hold its own. Furthermore, aluminium has the unique ability of being able to replace lead and zinc, besides copper, in the electrical field, and technical factors often invite this substitution.

We said welcome to...

S. Peer Mohamed Works Manager (Formerly, General Manager of Kerala Ceramics and Works Manager of Electrical & Allied Industries, Kundara, Peer Mohamed, already well-known in ALIND circles, joined as Works Manager of the Kundara Plant on 24th October 1957.

Probationers **N. R. Pillai** (Head Guard - Security); **P. Balakrishnan Nair** (Safety & House-keeping); **A. John** (Safety & House-keeping); **K. Karunakar** (Engg. Section); **B. Baghavathi Perumal** (Supervisor - Electrical); **P. S. Mani** (Accounts); **P. Raghavan Nair** (Stenographer); **Gandarbhia Sahoo** (Trainee Supervisor); **G. Ramachandran Nair** (Accounts - Material Accounting); **M. G. Sukumaran Nair** (Supervisor - Mechanical); **K. N. Nair** (Sales); **P. Aravindakshan Pillai** (Asst. Engineer); **P. M. Joseph** (Asst. Engineer); **M. Mohammed Kunju** (Tool Room); **P. K. B. Menon** (Typist).

Paid Apprentices - **T. P. Gopalan** (Electrical).

Unpaid Apprentices - **Rajan Nainan** (C. C. Plant); **K. Sasibhushanan Nair** (Wire Mill); **M. Velu Pillai** (Rod Mill); **A. Shahul Hameed** (Wire Mill); **P. Muraliedhara Menon** (C. C. Plant); **A. K. George** (Wire Mill); **S. K. Vikram Kumar** (Electrical); **V. K. Sivasankaran Nair** (C. C. Plant); **K. Subramonia Iyer** (C. C. Plant); **T. P. George** (C. C. Plant); **M. A. Mohammed Moideen Khan** (C. C. Plant); **Arthur Gonsalves** (C. C. Plant); **P. Krishnan Nair** (C. C. Plant) and **K. Thankappan** (Mech. Maintenance).

They were married...

V. S. Menon, Electrical Supervisor, with Miss Kamalam.
M. A. Mathew, Junior Operator, Wire Mill, with Miss Mariamma.
N. Sadanandan, Chargeman, Mechanical Maintenance, with Miss Sathya Bhama.
G. Srinivasan Asari, Reel Shop, with Miss Thulasi Bai.
M. N. Vasudevan Nair, Supervisor, Wire Mill, with Miss Radha.
Miss Bianca, daughter of C. G. Pathrose (Civil Section), with **Mr. Pious**.
M. R. G. Menon, P. A. to G. M. (O. & M.), with Miss Kamalam.
Miss Kosala, niece of Mr. A. Kumaraswami Pillai (Personnel), with **Mr. Andy Pillai** (Alleppey).

We said farewell to...

K. Kunju (Diesel Engine Driver); **R. R. Bhaskaran** (Machine Shop) and **C. Johnson** (Mech. Maintenance).



M. R. G. Menon - Kamalam.



M. A. Mathew - Mariamma.



Pious - Bianca.

G. Srinivasan Asari - Thulasi Bai.



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N. Govinda Pillai.

Author, Painter, Musician and Linguist

N. GOVINDA PILLAI, DRIVER, SHIPPING, JOINED US IN 1951. Like several of our employees he, too, is a World War II veteran.

A lively debater, and a good conference man, Govinda Pillai has done outstanding work as Joint Secretary of the Works Committee. Indeed, he is very much respected for the frank expression of his views and leadership.

A man of varied interests, and author of several books including a few plays, music is a passion with him. He can play virtually on all musical instruments, a speciality being *mridangam*, the percussion instrument of South Indian classical concerts.

Painting and languages he can read and write as many as five he tells us are his hobbies.

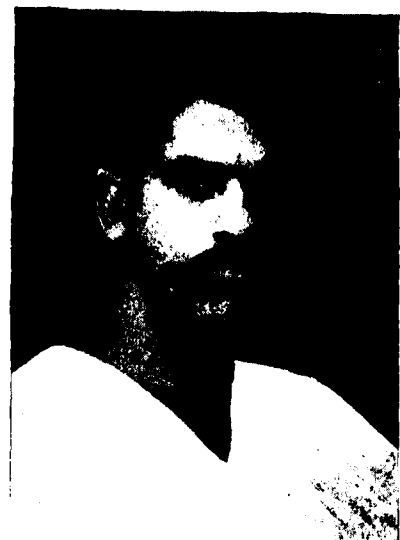
* * *

Athlete

G. V. NAIR, CHARGEMAN, MECHANICAL MAINTENANCE, yet another Works Committee Member, joined ALIND early in 1950. Before coming to our Company, he had put in a service of four years as a cinema operator in Quilon, and had also served as a fitter in I.E.M.E. As a member of the Armed Forces, he had travelled extensively in India, Ceylon, Malaya and the Cocoa Islands.

An athlete of no mean reputation, G. V. Nair was our 1950 sports champion. Good at organising, he gives willingly of his time and talent to the successful celebration of ALIND functions.

Reading constitutes his chief off-work interest.



G. V. Nair.

Card-player

G. NARAYANA PILLAI, JUNIOR OPERATOR, WIRE MILL, IS another Works Committee personality, whom we would like our readers to know. He came to the Company as early as 1947. Prior to this, he was working in a cashew factory.

As a representative of the Wire Mill constituency on the Works Committee, Narayana Pillai has shown himself to be a jealous champion of the interests of his fellow-workers.

A devoted family man, he normally spends his leisure hours in the company of his children or poring over 'progressive' literature, his favourite author being Thakazhi Sivasankara Pillai. Such moments as he can snatch away from his family or books, he spends in playing cards. Curiously enough his favourite film star is the singing star and matinee idol of a former generation, M. K. Thyagaraja Bhagavathar.

Narayana Pillai is a conscientious workman, and a very popular ALINDER.

* * *

Wrestler

ANOTHER WORKS COMMITTEE MEMBER WHO OBVIOUSLY shares Narayana Pillai's film tastes is A. JOSEPH, Gang Leader, Inspection. M. K. Thyagaraja Bhagavathar is his favourite star too. And like Narayana Pillai he, too, joined us as far back as 1947.

Wrestling is his favourite sport. Short and stockily-built, his very appearance advertises his devotion to this gentle art of flooring other people! Kitchen gardening is his favourite hobby.

A married man with four children—whose proper education is his sole ambition in life—Joseph is a friendly, cheerful type whom it is a real pleasure to know.

* * *

Cultivator

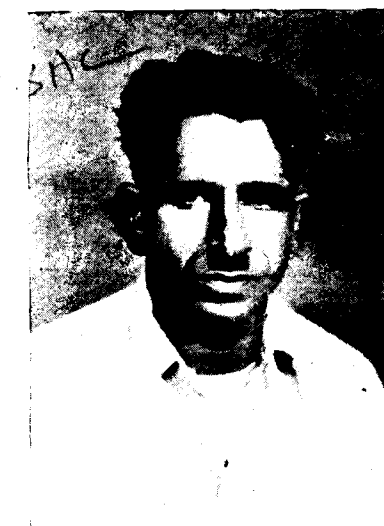
YET ONE MORE WORKS COMMITTEE MEMBER WHOM WE would like to present in this issue is M. P. Kuttappan, Reel Shop. He joined ALIND in 1952.

A *suave*, soft-spoken man, he is nearly not so soft-spoken when it comes to a question of espousing the cause of fellow-reelers. Like other members of his community, Kuttappan, too, is devoted to art and literature. "Culture" is a passion with him.

Agricultural cultivation and card playing are Kuttappan's two great off-work interests.



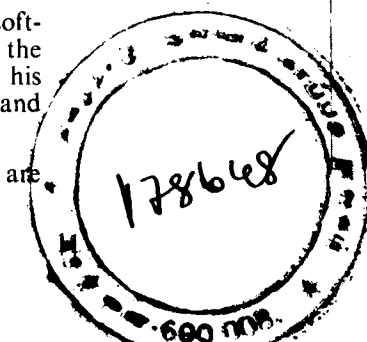
G. Narayana Pillai.



A. Joseph.



M. P. Kuttappan.





On Factory Day and similar festive occasions, if our little township looks like a miniature fairyland, the transformation owes not a little of it to the brilliant flashes of Aundy Pillai and his coruscating crew.

Aundy Pillai was one of the earliest to join the company; he came to ALIND in 1947.

Oh, yes, he was at the Engineering College for five years, but not as a student, though he was an Instructor. Several electrical engineers in the State have at one time or another passed through his hardened hands, and

very well, indeed. The paper he presented on "Wiring Systems" at a Supervisory Study Group meeting—though it was in Malayalam—was a model of its kind, revealing, incidentally, his able grasp of the theoretical aspects of electrical engineering.

Deeply religious, he is a great devotee of Ayyappan, and makes the annual trek to the shrine at Sabarimalai.

"Cards" are the only relaxation he permits himself—he is an expert bridge player. Sound engineering is another of his interests.

M. AUNDY PILLAI—Our Electrical Foreman

Nature and Nature's laws lay hid in night

God said, Let Newton be! and all was light.

SO SANG ALEXANDER POPE OF Newton. We would not, of course, pretend that M. AUNDY PILLAI, gifted as he is in many ways, is as great a personality as the inventor of the Law of Gravity, but we would not be erring far too much, if we revised the lines of the Augustan poet to read:

ALIND and ALIND's byways lay hid in night;

The company said, Let Aundy be and all was light!

among them, our own VGG and Peer Mohammed. Before being absorbed into the teaching staff of the Engineering College, Trivandrum, Aundy Pillai was working for the State Electricity Department. Later, he worked for A. V. Thomas & Co., for a period of four years.

Verily a wiring wizard, the installation so difficult or so complicated that it can perplex Aundy Pillai has yet to be invented.

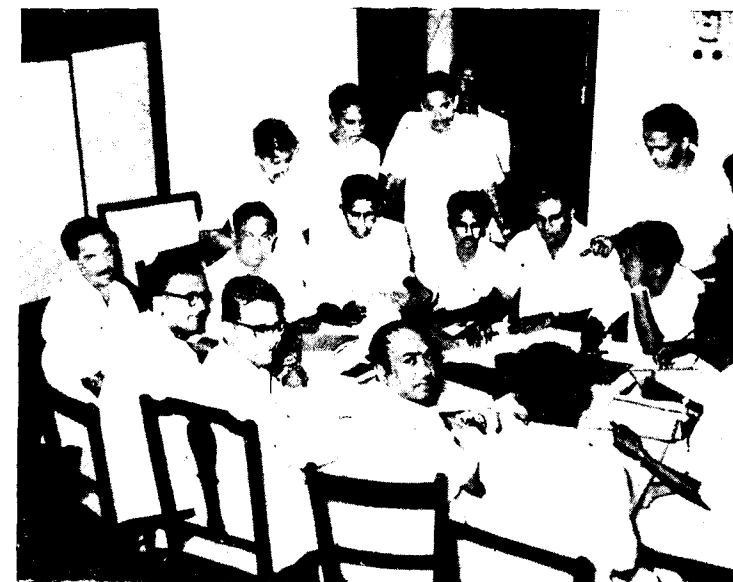
Aundy Pillai might not have had the benefit of formal education, he might have received his lessons only in the hard school of practical experience, but, then, he has learnt them

One specially lovable trait of Aundy Pillai is that he is none of those stiffish, stand-offish, foremen who rasp out commands to their men from a safe and respectable distance. He would do a thing himself if one of his own crew should prove unequal to the job of work assigned, rather than shout at him in a superior sort of way. And, despite his great interest in "big noise", he is himself a slow and very much of a "sweet-and-low" speaker.

Efficient, reliable, and unassuming to the point of near self-effacement, Aundy Pillai is a shining example of service above a snobbish self!

Company signs four-year agreement with Employees

Several new benefits: Increased dearness allowance rates, increments to basic wages, many new allowances and a gratuity scheme.



ALIND signed a four-year agreement with employees in December 1957. In the picture are seen representatives of the various Unions together with representatives of the Company.

ON DECEMBER 11, 1957, THE ALUMINIUM Industries Limited, Kundara, signed a comprehensive, bi-partite agreement for a period of four years with its employees through their representative Unions.

The agreement was negotiated (a) to provide orderly collective bargaining relations; (b) to secure fair and prompt dispositions of grievances; (c) to establish fair wages and other working conditions; and (d) to maintain harmonious relationship between workmen and employers.

The terms of the agreement provide for facilities to the Unions to collect their dues and to allow them to have their own notice boards in the premises of the factory.

A noteworthy feature of this agreement is that it was negotiated with an *ad hoc* negotiating body chosen by the various Unions of the company. It was really heartening to note that Unions affiliated to various central Trade Union organizations unanimously agreed with management that payment of bonus based on profit was neither scientific nor desirable; they therefore agreed to

a system of payment of annual bonus as well as incentive monthly bonus based on production.

The company has, also, agreed to pay dearness allowance based on cost of living indices which will, for the moment, increase the rates roughly by 50 per cent. Increments to basic wages, amounting approximately to 10 per cent of the total wage bill are another result of the agreement. Provision has been made for various allowances, such as night shift allowance for two shifts, washing allowance, tools allowance for carpenters, milk allowance for rod-mill men, and hospitalisation allowance in case of accidents.

A highlight of this labour-management contract is the formulation of a new gratuity scheme for employees, besides the existing contributory provident fund as retirement benefit.

A detailed grievance procedure aimed at settling the day-to-day grievances of the men expeditiously, and at various levels, is also embodied in the agreement.

According to the terms of this agreement, the Unions undertake not

to strike or "slowdown" and the management agrees not to declare any lockout during the period of the contract. The Unions have also agreed not to advance (during the contract period) any new demands for wages, bonus, etc.

Unlike other employer-employee agreements negotiated in this country in the past, this agreement provides for the appointment of an arbitrator to settle any dispute, difference or disagreement between the parties during the period covered by it.

The total financial benefits conferred on workmen by this agreement, assuming normal production, amounts to Rs. 25 lakhs during the contract period.

The joint negotiations, under the mediation of Mr. P. N. Krishna Pillai, Personnel Manager, Indian Aluminium Company Limited, Calcutta, formerly Labour Commissioner of this State, were initiated as a result of a decision reached by the parties in a conference held by the Labour Minister of the State, a few months earlier.

Centennial Celebration of India's First War of Independence

AUGUST 15, 1957, NOT ONLY MARKED the decennial anniversary of the country's attainment of freedom, but it also marked the centennial anniversary of India's First War of Independence, misnamed the Sepoy Mutiny, by jingoistic British historians of the ilk of Vincent Smith. Along with the rest of the country, ALIND, too, celebrated this historic anniversary with befitting solemnity.

At 8 a.m. a procession of about 300 children, impeccably clad in white *khadi*, bearing tri-colour standards, and accompanied by a band, started from the Dormitories, and wended its way down to the spot of the flagmast, where under command of P. K. Narayana Pillai, Head Guard, the Security Staff had already lined up.

Promptly at 8-15 a.m., Director B. V. D. Menon and party which included, among others Mr. V. P. Appadurai, Chief Engineer, Madras Electricity Board, arrived at the spot.

To the strains of *Jana Gana Mana*, BVD hoisted the National Flag.

In the course of a brief speech, he recalled how about 150 years ago, the great Velu Thampi Dalawa had made his historic proclamation on the soil of Kundara. "Velu Thampi Dalawa had dedicated his whole life even sacrificed it on the altar of a noble cause—namely, the freedom of the country. On this memorable occasion, let us also rededicate ourselves to another noble cause—namely, the economic development of the country", he said.

Appositely enough, the day's ceremonies came to a close with the presentation, in the evening, of *Velu Thampi Dalawa*, a play portraying the martyrdom of this patriot-hero. Written by Kainikkara Padmanabha Pillai, a well-known Malayalam playwright, his own brother, Kainikkara Govinda Pillai, our Security Supervisor, played the title role, ably and nobly sustaining it. The rest of the cast was:

M. K. C. PILLAI	... Neelan Pillai
N. R. PILLAI	... Kunjukutty Pillai
P. A. IBRAHIM	... Yuvaraja
M. K. VARUGHESE	... Maharaja
K. SEETHARAMAN	... Murali Bhagavathar
T. K. RADHAMONI	... Col. Macaulay
V. M. ABRAHAM	... Mathoo Tharakan
K. S. K. KRISHNAN	... Sankara Narayanan Chetti
K. R. O. NAIR	... Lakshmi Amma
THANKAPPAN NAIR	... Mother of Lakshmi Amma
S. N. NAIR	... Ambika
M. R. C. NAIR	... Padmanabhan Thampy



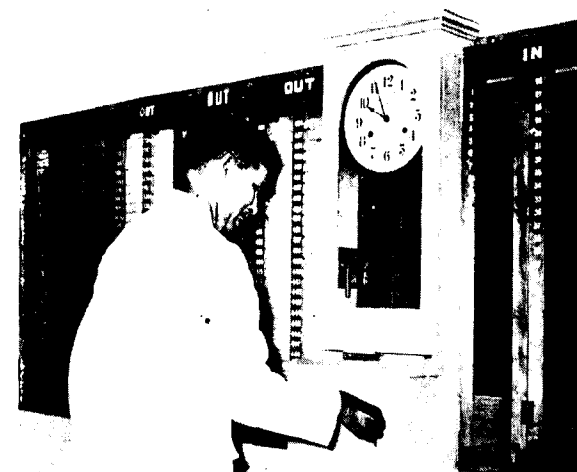
Independence Day : Director B. V. D. Menon unfurls the national tri-colour.



To mark the centennial anniversary of India's First War of Independence (1849) employees staged a commemorative play, *Velu Thampi Dalawa*. Picture shows a scene from this fine historic play.



A tense moment in the play: The great Velu Thampi Dalawa made his historic proclamation on the soil of Kundara.



Mr. V. P. Appadurai, Chief Engineer, Madras Electricity Board, "punches in" the first card at the new Time Office.



A view of the newly-built Time Office.

Madras Chief Engineer "punches in" card at New Time Office

On August 15, 1957 (Independence Day) Mr. V. P. Appadurai, Chief Engineer, Madras State Electricity Board, "punched in" the first card at the new Time Office, which was formally declared open by Director B. V. D. Menon.

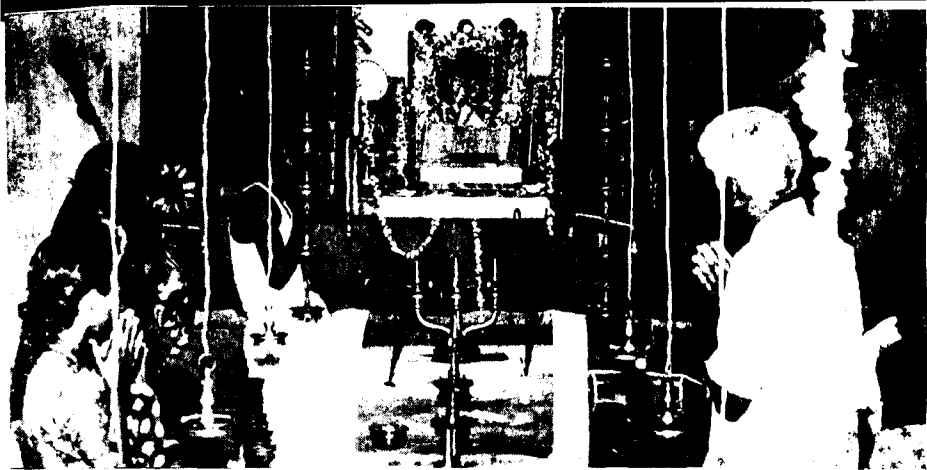
A compact and aesthetically satisfying structure, the new Time Office is the place for taking time by the forelock!

After Mr. Appadurai, Mr. Menon and Mr. V. G. G. Nayar "punched in" their cards.

In the last issue of the CHRONICLE, we gave a *résumé* of the activities of SSG up to June 5, 1957. Meetings held since (to end of December 1957) include:

Date.	Subject.	Speaker.
June 28, 1957	... Cost accounting as an aid to production management.	T. K. Krishnan, Asst. Secretary.
August 2, 1957	... Impressions of a tour of the Damodar Valley.	Director B. V. D. Menon.
September 25, 1957	... Financing the Second Plan.	Director S. Narayanaswamy.
October 17, 1957	... Plastics and their use in Cable Covering.	P. Madhavan, Foreman, C. C. Plant.
November 23, 1957	... Kerala Electricity System.	Mr. K. G. Seshan, Asst. Engineer, Kerala Electricity Board.
December 12, 1957	... Special Meeting.	Mr. P. N. Krishna Pillai, Personnel Manager, Indian Aluminium Company.
December 16, 1957	... Dilemma of an Indian Trade Unionist.	Mr. K. V. Surendranath.

Supervisory Study Group Meetings



Worshippers at work ! May Goddess Saraswati grant them all their prayers !



Pancha Vadya : An orchestra consisting of percussion, wind and string instruments, a traditional feature of Hindu temples, was "imported" on Ayudha Puja Day.



Kalari Payattu : The Netaji Kalari Sangam gave a fine display of Kerala's traditional art of self-defence and offence on Ayudha Puja Day. Picture (Left) shows a member of the troupe in action.

Right : Master Usman, the youngest member of the Sangam, whose showing was as good as that of any of its senior members.

AYUDHA PUJA

Two exciting days

ALIND CELEBRATED AYUDHA PUJA WITH its wonted *éclat* on October 2 and 3. This year it was the Works Committee, the elected, consultative body of the works-people who gave the *puja* both shape and form.

The old Recreation Hall served as the venue for the religious side of the programme, and the new Reel Shop—for the entertainment side.



Ottam Thullal : Malabar Raman Nair, a celebrated exponent of this operatic art discoursing on Sundari Swayamwara, a popular story.



CELEBRATIONS

of art and culture

On the first day, immediately after *puja*, a *bhajana* party got going, in full-throated ease, led and conducted by Raghavan Asari. Members, of the choir were, for the most part, drawn from the Reel Shop, the cultural fountainhead of the company. Other fare offered on the day included : *Ottam Thullal* (a sort of one-man, ballad opera) by that celebrated exponent of the art, Malabar Raman Nair, and a fine historical play, *The Nineteenth Century*, put on boards by the Kerala Nataka Samithi. The *thullal* piece dealt with the popular story of *Sundari Swayamwaram*.

Where the *Asaris* left off, our singing foreman Sitaraman took up ! Which in basic English means approximately that at the *bhajana* performance, on the second day, it was Sitaraman who lent most magnificent support to Rajagopala Bhagavatar of Quilon. With the reading of *Bhagavatam*, our great national epic, the religious part of the celebrations came to a close.

At 4-30 p.m., the usual literary session was held at the Recreation Hall, with V. G. G. Nayar acting as Chairman. Mr. G. Kumara Pillai, University Lecturer in English, and a well-known Malayalam poet and speaker, and Thirunalloor Karunakaran, University Lecturer in Malayalam, also a poet, were the guest speakers.

Mr. K. Chandrasekhara Sastri, formerly Member of the State Legislative Assembly, also spoke.

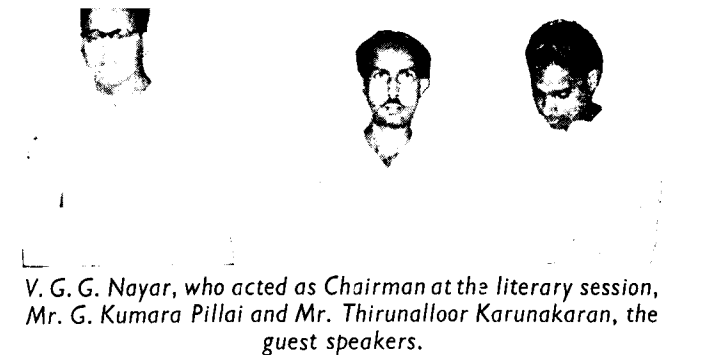
Mr. Kumara Pillai said that *Ayudha Puja* symbolised the victory of the forces of good over those of evil, those of culture over anarchy. He deprecated the tendency discernible in the work of certain writers who were, really speaking, pamphleteers, rather than creative artists.

Thirunalloor said that in the new and up-and-coming socialistic countries, say, like China, underlying all activity was a resurgent, nationalistic fervour and that their art and literature of recent times showed and reflected the new spirit. On the other hand, in the writings of our moderns, our new-born, nationalistic sense was conspicuous by its absence.

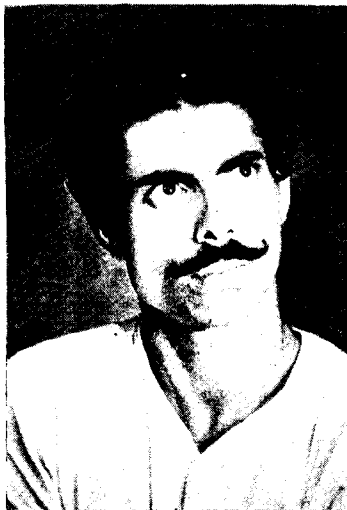
Two popular items followed the speeches—a *Kavita Matsara* (Poets' Symposium) and an *Akshara slokam* contest.

In the quiz contest of the year, R. K. Krishna Asari proved that he knew all the answers.

A concert programme by Paravoor Devarajan and party and *Kalari Payattu* Kerala's gentle art of self-defence—and offence—by *Netaji Kalari Sangam* provided a fitting finale to two exciting, enjoyable days of art, culture and what-have-you.



V. G. G. Nayar, who acted as Chairman at the literary session, Mr. G. Kumara Pillai and Mr. Thirunalloor Karunakaran, the guest speakers.



He knew all the answers !
R. K. Krishna Asari—the quiz contest winner.

An interesting moment from *The Nineteenth Century*, put on boards by the Kerala Nataka Samithi.



IF SANTA CLAUS KEPT HIS DATE WITH us somewhat later in the month in previous years, this year he quite made up by calling on us earlier than usual, indeed as early as December 15!

The whole day was one of bustle and activity, the celebration getting under way with Children's Sports, beginning at 8 a.m. and breaking up around 12 noon. At 4 p.m. we had the Baby Show, the venue as usual being the compound of A-1 quarters, V. G. G. Nayar's residence. A beautiful *shamiana* with a decorated dais had been put up, and it looked, very grand indeed, the lights competing with the shining faces of the children... and coming in a poor second! And at the Show itself, we had the child marvel, the staggering child, the child astounding, the child dumbfounding, the child unsurpassed and the child to flabbergast! Indeed all the children,

Bright as a button, sharp as a thorn

And the only perfect ones ever to be born

were all there! "Grading" such a collection was no picnic. The panel of judges consisting of Dr. (Mrs.) Kamala Ramier, District Medical Officer, Quilon, Dr. E. K. Raman Pillai, our own Medical Officer, Dr. S. D. Edwards of L.M.S. Hospital, Kundara, and Dr. Thomas Zacharias, Government Dispensary, had a tough task of their pickin' and choosin' assignment.

In the first group, Baby Daisy-kutty, daughter of V. O. Mathew, Labour Officer, and Indira, daughter

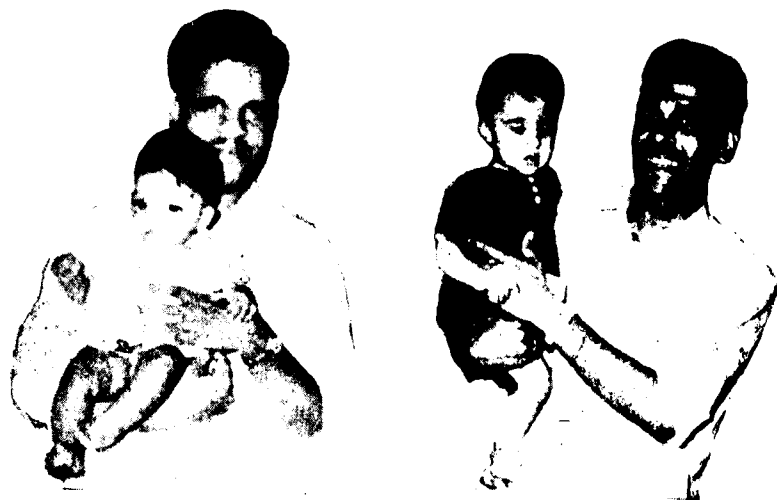
of G. K. Warrior, Supervisor, Safety and Housekeeping, were the prize-winners. And in the second group, Baby John Panicker, nephew of Thomas Panicker of Wire Mill and Baby Jayalakshmi, daughter of K. R. Sankaranarayanan, Secretary, were the first prize-winners. But as all the competing children were stupendous, marvellous, etc., etc., all of them were given special prizes!

The next item on the agenda was a song-and-dance sequence, quite ably rendered, by the students of the local St. Margherita High School, all the participants being daughters of ALINDERS. The orchestra leader was Fr. Sam Netto, the Parish Priest.

In fact, if a lively bill of fare was offered by the children, it was

largely because Fr. Netto was such a superlative cook!

And then came Fancy Dress, our three-star event. Impersonations included: Demon King (Jains, son of P. Antony), Lord Shiva (Bhagyalakshmi, daughter of K. R. Sankaranarayanan), Namboodiri Woman (Mohammed Ali, nephew of P. A. Ibrahim), Palani Andavar (Profulla Chandra, son of M. R. C. Nair), Sanyasi (Mathew, son of Yonanna Panicker) Angel (Mollykutty, daughter of M. K. Varughese) Lord Krishna (Samson, son of A. Joseph) and Hospital Nurse (Kannan, son of V. G. G. Nayar) The charming little woman in white was adjudged the first prize-winner, and Palani Andavar, the second prize-winner. All the



Daisy Kutty and Indira—prize-winners in the first group.



John Panicker (Left) and Jayalakshmi (Right) were prize winners in the second group.

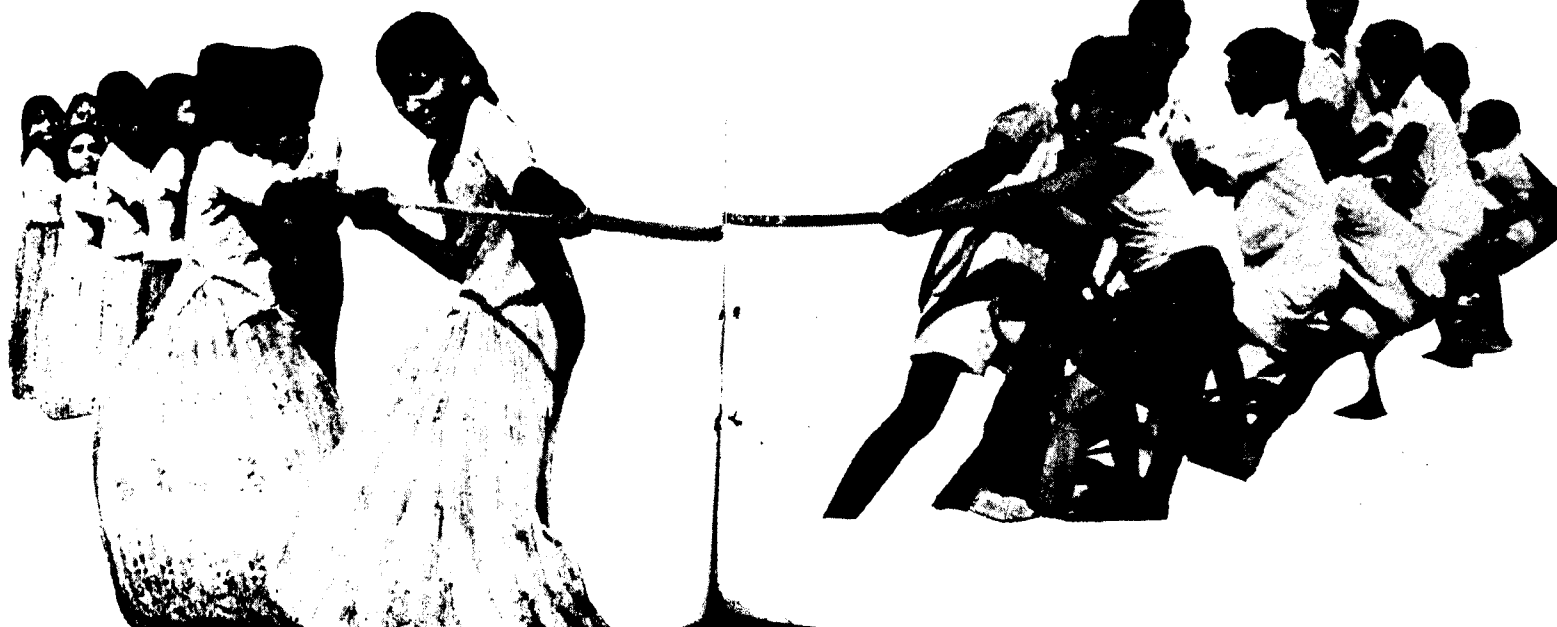


Mohamed Ali, nephew of P. A. Ibrahim, receiving a prize from Father Christmas.

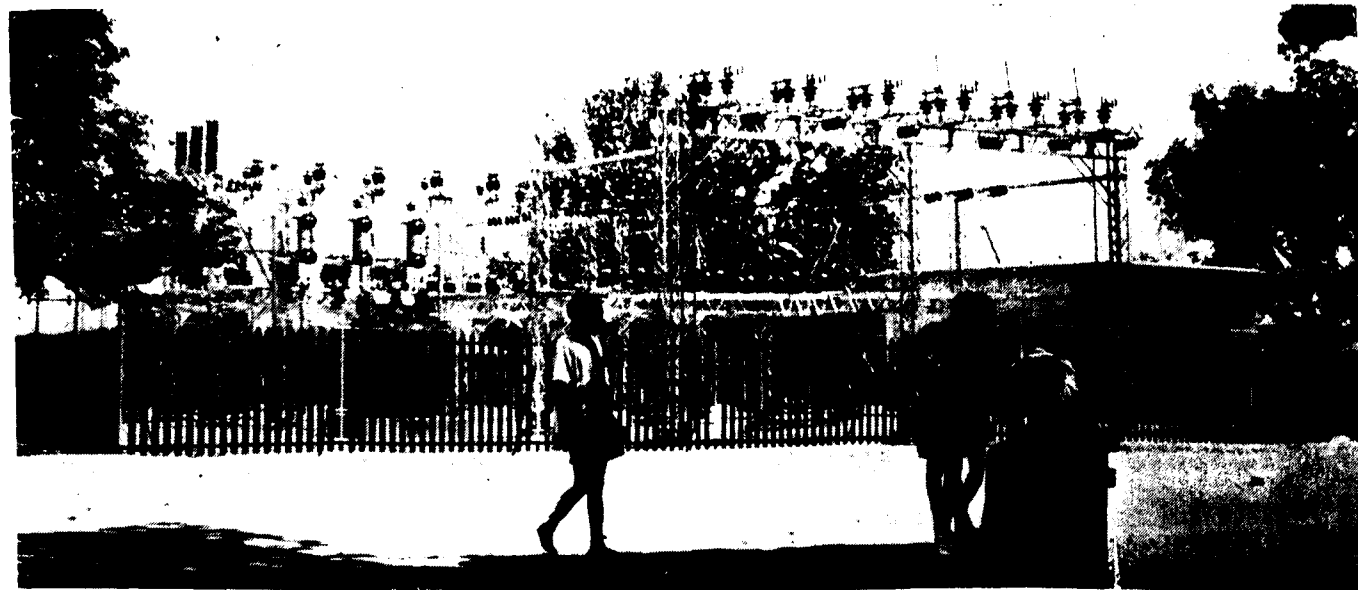


Darkness at noon! Blind Man's Buff is always a most popular event with children.

below "Biting the bun."



The (Tug-of) War of the Sexes! This year, boys avenged their defeat of last year at the hands of the girls.



33 kV substation

Our Friend—The Customer

THE CUSTOMER WHOM WE HAVE THE honour to present in this issue is the 'West Bengal State Electricity Board.' Between Kerala and West Bengal, there is at least one striking point of similarity—both are densely populated States.

Even before partition, the Calcutta area, because of its port and market facilities and electric supply benefits, was a well-enough industrialised area, but not, however, the rest of the State. After partition, the situation worsened—that is, the Calcutta area became even more of a densely populated area, drawing practically all the displaced families of E. Bengal.

Compared with the problems that West Bengal had to face after the transfer of power, those of other States are of the size of peanuts! If resettlement were to proceed smoothly, the pace of rural development had to be quickened. And a pre-requisite to that development was the extension of electricity supply to rural areas.

Should only the yardstick of electricity generation and consumption be used to measure the industrial expansion of the State, it will have only a sorry state of affairs to reveal. For, in 1947, the installed capacity of generating plant in West Bengal was roughly 27 per cent of the all-India total, but this capacity will fall to about 12 per cent by 1960-61. In the words of Mr. A. K. Bhau-mik (Chief Electrical Engineer and Electrical Adviser to Government of West Bengal and Electrical Engineer Member, West Bengal State Electricity Board)—and to whom and *Indian Construction News*, this writer is vastly indebted for help received in the preparation of this article,

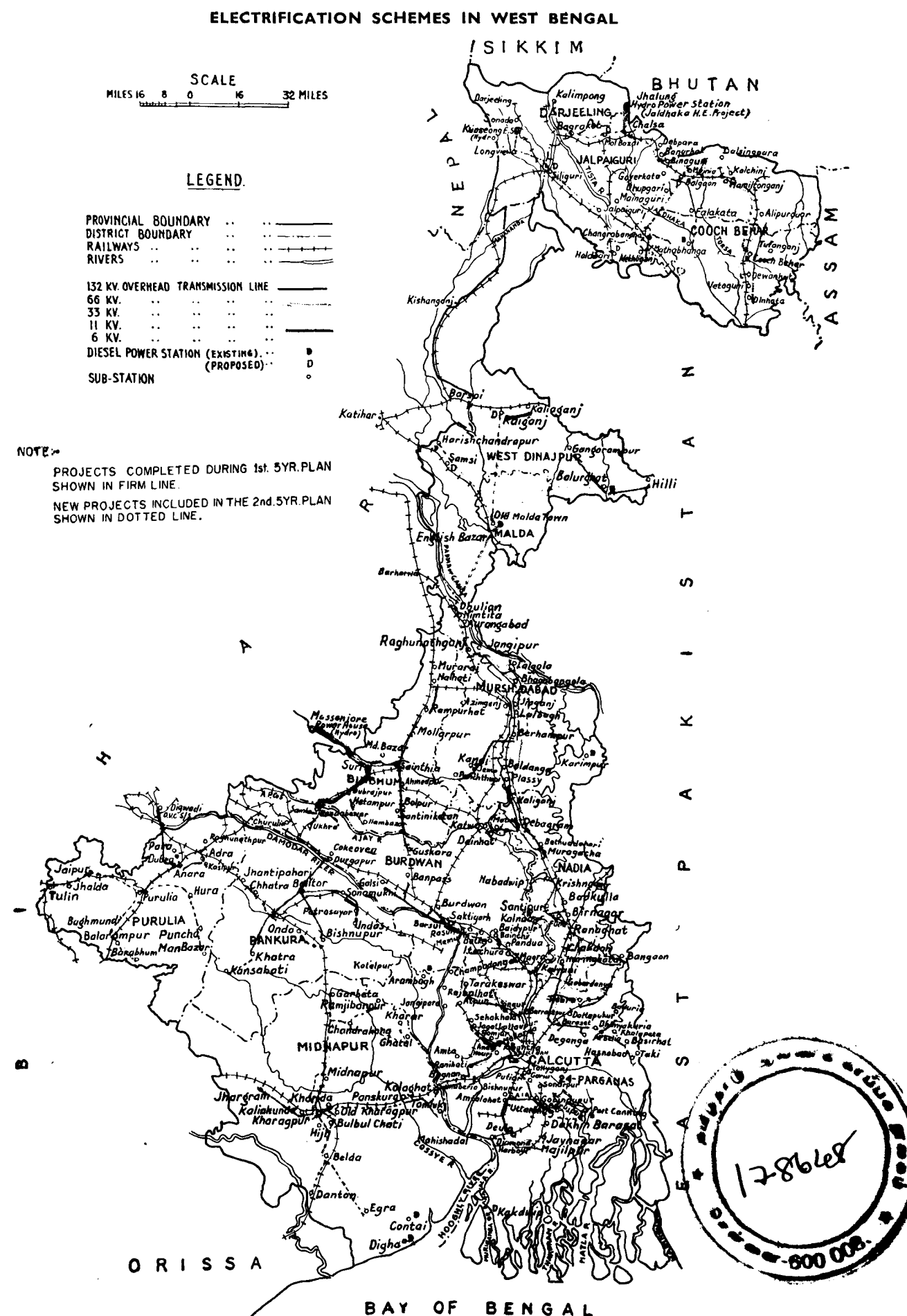
"Unlike in other States, until the pre-Plan period, (in W. Bengal) the generation and distribution of electricity was left entirely in the hands of private licensees who in turn concentrated all their efforts on the electrification of a few major towns leaving all other towns and villages completely in the dark."

FIRST PLAN ACHIEVEMENTS

With the object of removing this anomaly, the Electricity Development Directorate of the State Government was formed in 1946 and electric supply systems to various parts of the State have since then been systematically planned and executed. The total investment in the public sector to-day is about Rs. 6 crores against about Rs. 35 crores in the private sector for the promotion of electricity throughout the State. The works executed during the first Five-Year Plan are :

(a) *North Calcutta Grid* : Erection of 120 miles 66 kV line from Chord Road to Berhampore for electrifying 40 towns and villages covering in all 1,000 square miles.

(b) *Sonarpur-Arapanch Grid* : Erection of 40 miles of 33 kV line from Garia to Sonarpur for electrifying 12 towns and for supplying bulk power to Sonarpur-Arapanch drainage pumping station for agricultural development.



(c) *Electrification of Coalfield Area* : Erection of 15 miles of 11 kV lines to supply bulk power to seven coal mines in the Asansol area.

(d) *Mayurakshi Reservoir Project* : Installation of one 4,000 kW generating station and 70 miles of 33 kV and 30 miles of 11 kV transmission lines in Birbhum district and the electrification of ten towns under Mayurakshi Reservoir Project covering 400 square miles.

(e) *East Calcutta Area* : Erection of 30 miles 33 kV and 40 miles of 11 kV lines supplying electricity to 12 towns on the eastern side of Calcutta area.

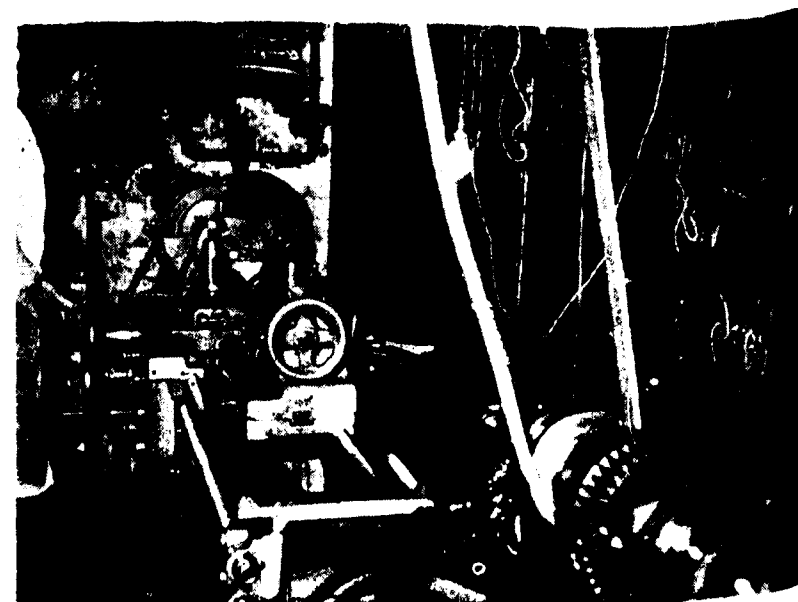
(f) *Diesel Electrification* : Electrification of fifteen towns by small diesel electric plant covering in all 100 sq. miles in various parts of West Bengal where the extension of the Grid was found uneconomical with the comparatively low demand of the locality which is situated far off the Grid.

(g) *Taking over of existing undertakings* : Ten supply undertakings were taken over by the Board for better development of the area concerned and for extending electric supply to the neighbouring areas.

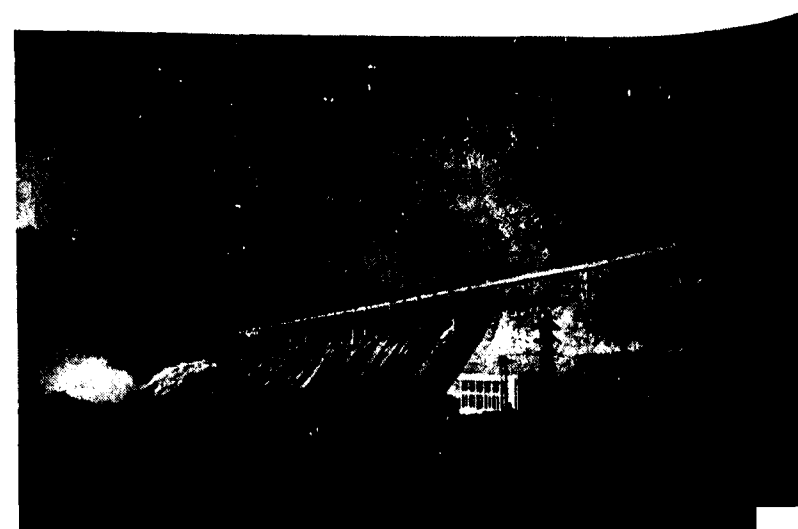
The salient features of all the works undertaken may be summarised thus :

1. Addition of generating capacity - 5,500 kW.
2. Purchase of bulk power from existing sources for transmission and distribution - 11,000 kW.
3. Additional area served - 3,000 sq. miles.
4. High Tension and Distribution Lines - 900 miles.
5. Low voltage distribution lines - 200 miles.
6. Number of towns electrified - 93.
7. Number of supply undertakings taken over - 10.
8. Total number of consumers connected - 11,700.
9. Number of distribution sub-stations installed - 50.
10. Total capacity of transformers installed - 38,000 kVA.

Mr. A. K. Bhaumik, Chief Electrical Engineer and Electrical Adviser to Government of West Bengal and Electrical Engineer Member, West Bengal State Electricity Board.



A small power-driven workshop.



Mayurakshi Dam, power-house and main switch-yard.

Of the list of works given above, perhaps the most noteworthy are : Erection of North Calcutta and Sonarpur-Arapanch Grid and the installation of Mayurakshi Hydro-electric Power Station. The North Calcutta Grid, the first scheme of the State Government, involved the installation of one 15,000 kVA capacity 33/66 kV main substation and the electrification of a wide area up to Berhampore. Successful implementation of the Sonarpur-Arapanch Grid helped the State Government to dewater a vast low-lying area in Sonarpur region and to promote agricultural production to a great extent. What was once fallow land due to inundation by saline water, is now rich agricultural field.

The Mayurakshi Reservoir Project is principally an irrigation project with a small surplus water for the generation of electricity. A masonry concrete dam 2,170 ft. long and 123 ft. high was built across the river at Messenjore in the State of Bihar and 20 miles from Suri headquarters of Birbhum district. The dam would store monsoon discharge of the Mayurakshi river to the capacity of 0.5 miles acre ft. covering a catchment area of 780 sq. miles and would control its release to the requirement of the agriculturists. Firm discharge of 300 cusecs is spared for the generation of hydro-electricity throughout the year and an additional 300 cusecs during the monsoon — that is, from June to October. Two steel penstocks of 6 ft. dia. are laid inside the dam and the power station is located at its base. There are two sets of 2,800 HP/2,000 kW capacity each operating under the design head of 100 feet. Power is generated at 11 kV and is stepped up to 33 kV at the adjoining main switch-yard. It supplies power to all the towns and villages in the district of Birbhum, including several Community Development Project areas and coalfields near Pandaveswar. Arrangements are now being made to supply 500 kW of bulk power to Dumka 20 miles from Massenjore.

SECOND PLAN AMBITIONS

But by all these arrangements were found still inadequate to meet the growing demand of the entire State, other schemes had to be drawn up

for implementation in the Second Plan period. And they are :

1. Extension of the Mayurakshi Hydro-electric Scheme.
2. Extension of distribution lines to more rural areas.
3. Implementation of Jaldhaka Hydro-electric Project.
4. Extension of transmission lines to Kharagpur, Midnapore, Howrah, Hooghly, Durgapur and Maldah areas.
5. Provision for electrification of more collieries, etc.

In addition, a thermal power station of 60 mW capacity is to be installed at Durgapur by the State Government and another 150 mW thermal station by the DVC. The Calcutta Electric Supply Corporation would also augment their supply position by 50 mW more.

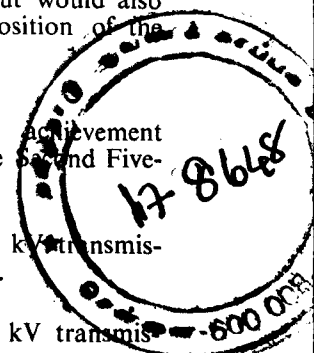
Of all these schemes, perhaps the most noteworthy are : (i) the installation of the thermal Station at Durgapur and (ii) the implementation of the Jaldhaka Hydro-electric Project in North Bengal. The former is for the supply of power to DVC for railway electrification, to ancillary industries proposed to be set up in the area and for rural electrification in the districts of Hooghly, Burdwan and Bankura. The Jaldhaka Hydro-electric Scheme is the first major scheme of its kind in West Bengal, envisaging the installation of a barrage 200 ft. long and 30 ft. high on the Jaldhaka river near the Bhutan border in Kalimpong subdivision, two miles open flume, two miles long 9 ft. diameter tunnel and a power station near the State Government's medicinal plantation at Rongo. The Scheme would utilise the firm discharge of 300 cusecs of the river to produce 12,000 kW of power throughout the year. During the monsoon, additional power of a like amount would also be generated for distribution to various tea gardens. Almost all the towns in North Bengal — Darjeeling and Siliguri at one end and Alipore Duar and Cooch Behar at the other — would be fed with electricity by a

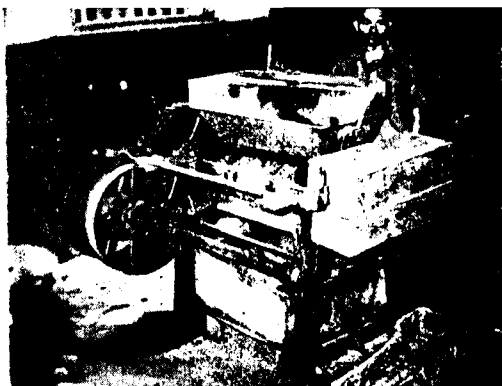
66/33 kV grid running throughout the entire area of North Bengal. With the implementation of this project, tea gardens would also be benefited with the monsoon power for their tea drying — a unique feature not found elsewhere in the country. The cost of this project is estimated to be about Rs. 3.50 crores; it is expected to be commissioned with its 66 kV and 33 kV grid by the end of 1960-61. The geographical location of North Bengal is unfavourable for electricity development on thermal system or by costly diesel generation. Further, the area has also high water power potentiality for utilisation as a commercial venture. As the total output of the Jaldhaka Project is inadequate for the entire area, more hydro-electric projects of much bigger magnitude would be taken up during the Third Plan. In the meantime, a detailed investigation of the Teesta river has been taken on hand, and it is likely that as a result, about 450 mW of firm power and an additional like amount will come up during the monsoon. This project would not only provide ample cheap power to the entire North Bengal area, but would also relieve the supply position of the Calcutta region.

Taken together, Achievement anticipated during the Second Five-Year Plan will be :

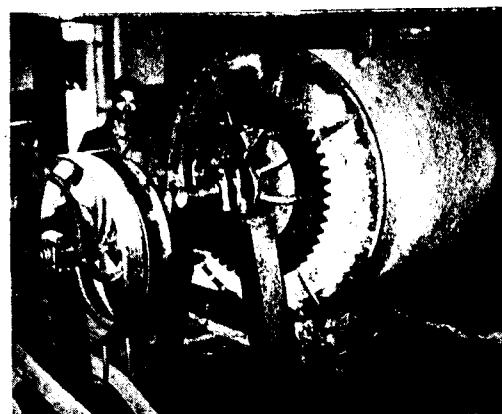
1. Erection of 66 kV transmission lines — 100 miles.
2. Erection of 33 kV transmission lines — 250 miles.
3. Erection of 11 kV transmission lines — 450 miles.
4. Distribution lines — 200 miles.
5. Additional number of places to be electrified — 120.
6. Additional generating capacity — 60,000 kW.

And when these schemes are implemented, small-scale industries would considerably benefit and also help in providing a better life to our displaced brethren from East Bengal.





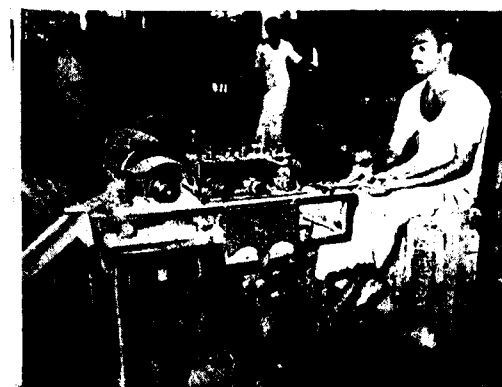
Roller Mill for lead : The first important step in the pencil-making sequence is to turn high-grade graphite into fine powder.



Ball mill : The second step is to have this powder ground in ball mills.



Casing : Finished planks—technically called 'slats'—are the 'raw material' for providing the casing of the leads. Below : Grooving : Grooves are made in each slat and the lead is fixed with glue or gum.



Our Neighbours...

Quilon Pencil Factory

IN THE LAST ISSUE OF THE CHRONICLE, we did the story of a paper-making plant ; it is, therefore, only appropriate that in this issue we do a 'pencil sketch'! So, here goes the story of a good neighbour who is engaged in pencil-making.

The QUILON PENCIL FACTORY was born in the travail of World War II, during a period when the manufacture of pencils in the State was ruled out as a practical impossibility. But ever since it came into being, its story has been something to write home about.

QPF is the dream child of Mr. G. D. Nair, its present manager and working partner, but it would have been still-born, had it not been for the assistance (mainly financial) given by the late Mr. N. A. Narayanaswamy Reddiar, an industrialist and philanthropist of Quilon. The factory was started on a modest scale with a small capital outlay and with about 20 people in 1945, but today its capital is well over Rs. 5 lakhs and its employee strength is as much as 70. Installed capacity is of the order of 150 gross a day.

In June of this year, the factory hopes to install some new up-to-date German equipment which it has already ordered.

Labour-management relations are of the most cordial kind.

Principal customers of the company are Union and State Government departments. Burma and Ceylon are its chief export markets.

Now, let us have an inside stab at pencil-making, which broadly consists of :

- (i) Manufacture of lead ; and
- (ii) Manufacture and deployment of wooden cases.

Pencil Lead

The most important raw material required in the manufacture of pencil lead is graphite, which is a form of carbon. A 'pencil graphite' is determined by its percentage of carbon content ; for example, graphite containing up to 97 per cent carbon is considered most suitable for pencil manufacture. This high-grade graphite is first pulverized, and by a series of washing processes, all the impurities are removed. The resultant powder is further ground for several days continuously in ball mills, and is finally passed on to lead-presses so that proper shape and consistency may be obtained. Thus we have the lead wires. These lead wires are then cut into 7-inch pieces and heated up to a temperature of 1000 deg. C. Heating is necessary to give the wires their close strength. Afterwards, they are treated with wax, and that completes the lead manufacturing part of pencil-making. But, it must not be forgotten that the proper selection of graphite, the type selected, the series of purification processes, heating and wax treatment all call for a very high degree of technical skill and experience.

Graphite

The high-grade graphite essential for pencil manufacture is found in the States of Kerala, Andhra and Bihar. In Kerala, large deposits are found in Vellanad in Nedumangad Taluk. At one time, a German mining company was operating here, and after they left, the Government Geology Department took over and continued operations for some time, but of late there has been a cessation of activity. In Bihar, mining is done, for the most part, at Titalgarh, but the graphite available here is not of the pure variety. Large deposits of graphite, suitable for pencil manufacture, are available in plenty in

Mr. G. D. Nair, the present manager and working partner of Quilon Pencil Factory.

Ceylon, but here again no facilities obtain for pulverization and purification.

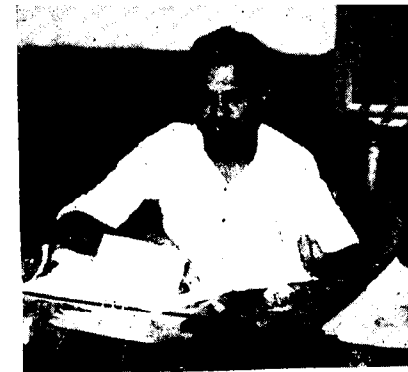
The graphite deposits in Nedumangad Taluk are the best of their kind, containing 97 per cent of carbon, and with the active interest of the State Government, graphite, enough and to spare, could be made available in the State itself.

The Casing

It is obviously impossible to use lead without a casing. In the early days, cheap and soft casing wood was used in some countries, and in Japan manufacturers went so far as to use even paper for this purpose, but experience taught them how costly the experiment could be, and the practice of using paper for casing was therefore given up. The forests of Kerala abound in the type of wood required for casing, and the QUILON PENCIL FACTORY has been studying and examining the question—in close co-operation with Government—for the last ten years, but investigations have shown that even the best varieties available could be used only for the inferior types of pencils.

Softness, straightness, close grains, and a good smell are the requisites of pencil wood. Unfortunately, we do not have in any of our forests wood bearing these characteristics to the extent required. *Deodar* (found in Himalayan forests) is about the best Indian wood that could be used for the purpose after some treatment. Researches in progress at the Government of India Timber Research Institute at Dehra Dun foreshadow the possibility of enough wood for pencil manufacture being available in about two years.

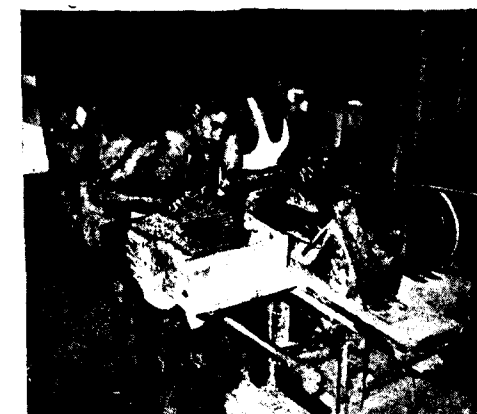
In India, as elsewhere in the world, the wood commonly used for pencil manufacture is cedar. Cedar trees abound in the forests of Kenya, in Africa, and in those of San Francisco in North America. Indian factories principally depend upon cedar wood for the manufacture of pencil cases, but for reasons of economy logs are not imported, but only finished planks—technically called 'slats'. These slats usually conform to a certain



Fixing : The lead is glued or gummed first into the groove of one slat. Another slat with an identical groove, also holding lead, is fixed on to the first slat and glued.



Painting : After polishing, pencils go in for a coat of paint. A special type of paint called 'pencil lacquer' is used.



Trimming : After painting, the pencils are passed on to trimming machines, where the edges are properly trimmed.



(Right bottom) Stamping : Details like brand name, category and company name are usually stamped. (Below) Packing : Pencils are usually packed in small bundles of grosses.



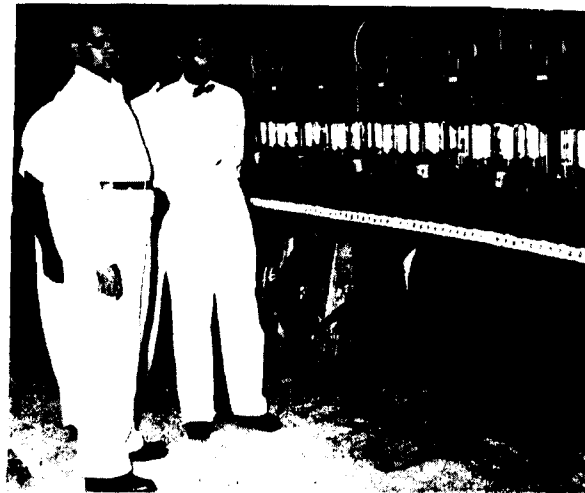
TO ALL THOSE WHO 'CAME UP AND SAW US SOMETIME' IN recent months, our grateful thanks. Here are pictures of some visitors who looked us up in the past few months.



L.-R.—(Sitting) Mr. L. Ferguson, Dy. Chief Engineer, Uganda Electricity Board, Mr. A. M. Mani, Superintending Engineer, Kerala State Electricity Board and Mr. B. V. D. Menon, Director. (Standing) Mr. G. D. Nair, Executive Engineer, Electrical, Quilon, and K. R. Sankaranarayanan, Secretary.



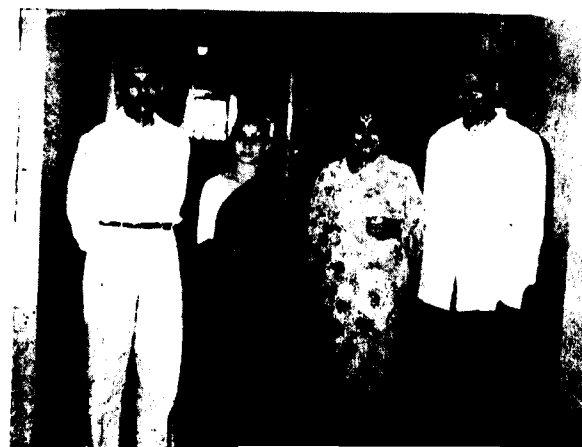
Mr. Alfred F. Kickbusch, Trade Commissioner for Germany, Madras, and Mr. P. G. Varghese, SVOC Agent, Kundara, with KRS in centre.



Mr. P. R. Deshpande, Director and General Manager, Crompton Parkinson, being shown round our Covered Conductor Plant by VGG.



With Mrs. Vijaya G. Nayar (fifth from left), are Mrs. Mathai, Mrs. Kutti Vellodi and Mrs. Gowri K. Nambiar.



L.-R.—Mr. F. C. Kohli, Senior Electrical Engineer, Tata Hydro-electric Companies and Mrs. Kohli with Mrs. Nayar and VGG.

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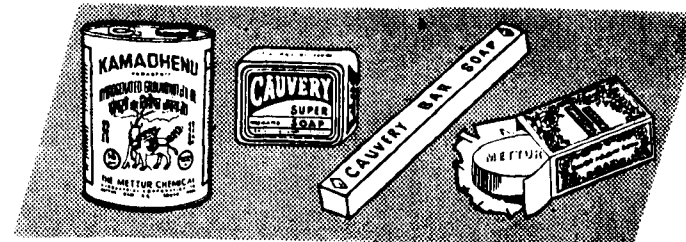
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CHARLES G. GORTON, A.I.R.I.

CONSULTANT TO THE ELECTRIC CABLE INDUSTRY

*Have you problems connected with electric cable manufacture?
Do you wish to enter a new line of cable manufacture?*

**If so, consult an expert with over forty years experience
of the cable industry.**

Formerly with leading U.K. cable manufacturers, also Technical Assistant,
British Ministry of Supply (Cable Planning) and first Works Manager,
National Insulated Cable Company of India Limited (1943-1948).

Among satisfied clients am proud to number

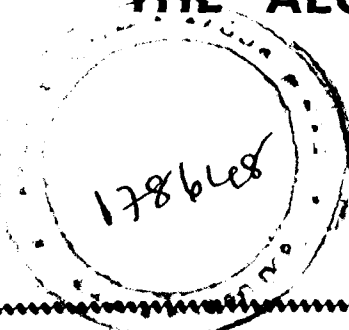
THE ALUMINIUM INDUSTRIES LIMITED

KUNDARA KERALA

Address your enquiries to :

CHARLES G. GORTON

82, St. Saviour's Road, Croydon, Surrey,
ENGLAND.



AS a leader in the aluminium cable-making business, we have always acted in the best interests of our employees, our shareholders and our customers. For instance, not long ago, we signed a comprehensive, four-year agreement with our employees . . . a human document based on mutual respect and consideration for the problems and viewpoints of each other.

The Grand Alliance

This 'grand alliance' between ourselves and our employees includes, among several good things, provisions for ;

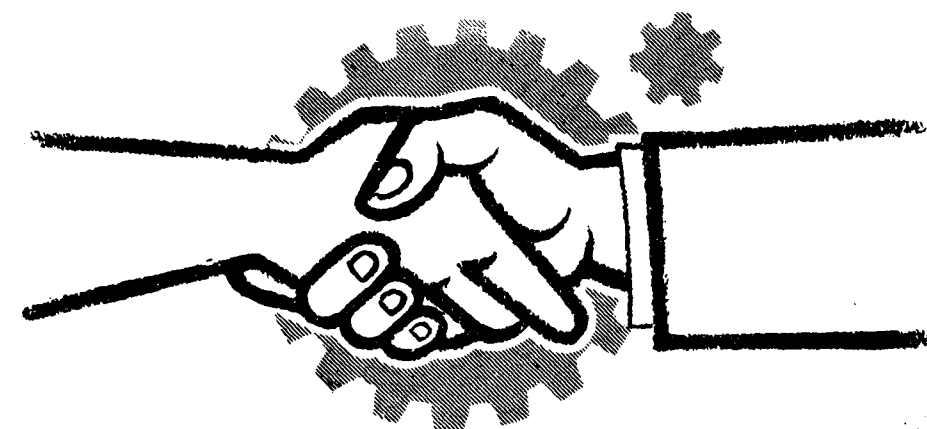
- (i) Orderly collective bargaining relations ;
- (ii) Continuous joint consultation machinery for improving working conditions and for facilitating redressal of day-to-day grievances ; and
- (iii) Facilities to Unions for collection of their dues on company premises and the display of their notices on Notice Boards provided by the company.

A highlight of our agreement is that bonus will be based on production, not on profit.

The agreement confers on our employees, during the period of its operation, financial benefits amounting to Rs. 25 lakhs.

Yes, the customer is the boss! And if he is served by the shareholder with his savings, he is served by the employee with his mind and muscle.

Our business is to act in the best interests of all three. The wheels of industry must go on turning without let or hindrance!



THE ALUMINIUM INDUSTRIES LTD

India's largest manufacturers of aluminium cables and accessories

KUNDARA KERALA STATE

Managing Agents : SESHASAYEE BROS. (TRAV) PRIVATE LTD

AL 480

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An exotic dance sequence and a folk dance number were the highlights of the attractive programme of entertainment offered by ALIND children on the occasion of the Christmas party. Picture above shows the children who participated in a Turkish style dance and that at the bottom those who participated in a folk number.



Birth of Christ: A tableau staged by ALIND children.



Children's Sports: 100 Yards dash.



Christmas Band: D'Cruz and his party of melody-makers.