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Orissa— Yet another ALIND Home

THE INAUGURATION OF THE HIRAKUD PROJECT MARKS the opening of a new chapter in the history of Orissa. Mahanadi, or the Great River, had for years been Orissa's river of sorrow. To-day, the turbulent Mahanadi knows how to behave itself: it has been tamed, civilized.

The Hirakud Project will enable two ears of grain to grow where one or none grew before. Not only agriculture, but industry too will benefit, for the project will provide the power necessary for Orissa's growing industries.

To a company such as ours engaged in the aluminium business, the opening of the Hirakud Dam is of the utmost significance. Power generated from this project will feed the new 10,000-ton smelter of the Indian Aluminium Company. According to the Second Five-Year Plan, the industry is scheduled to expand to 30,000 tons, and the vital role that awaits Hirakud in this expansion is therefore self-evident. As the electrolytic reduction of aluminium calls for a large power consumption—no less than 10 kWh of electrical energy being required to make 1 lb. of aluminium—the opening of Hirakud is of significant interest not only to Orissa's economy, but also to the aluminium industry of the country.

And ALIND is also setting up a new plant in Orissa. Proposed facilities will include both a rod mill and a cable mill. In less than two years, we expect our new plant to get going, and then our customers up north especially, will have a strategically-located new source for ALIND products.

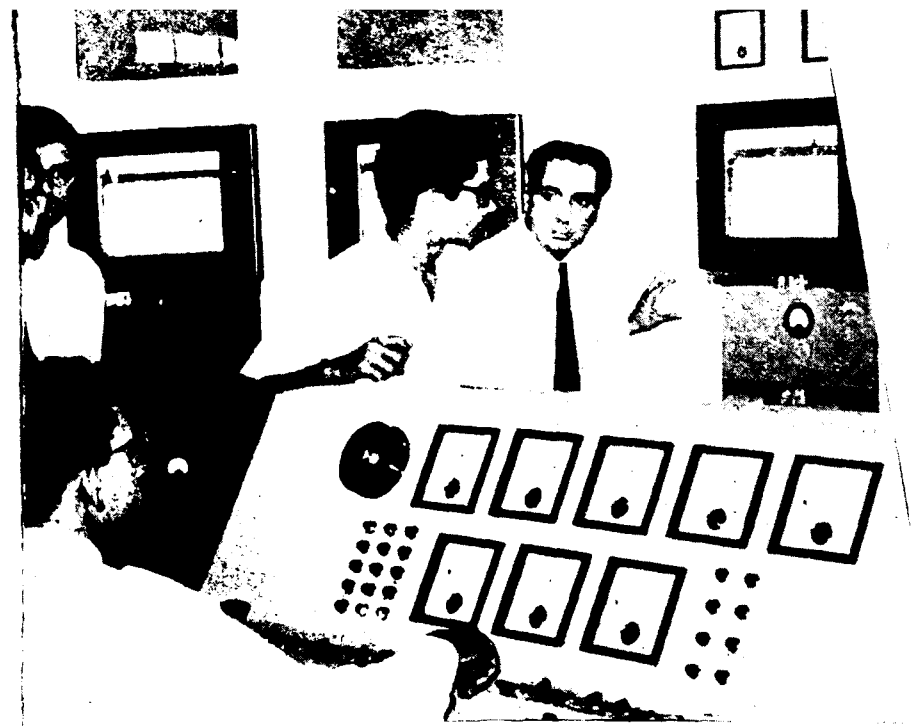
THE COVER: V. G. G. Nayar and President Rajendra Prasad at the party given by the President on Republic Day.

APRIL 1957

Editor: R. PARTHASARATHY

THE PURPOSES of this publication are:—

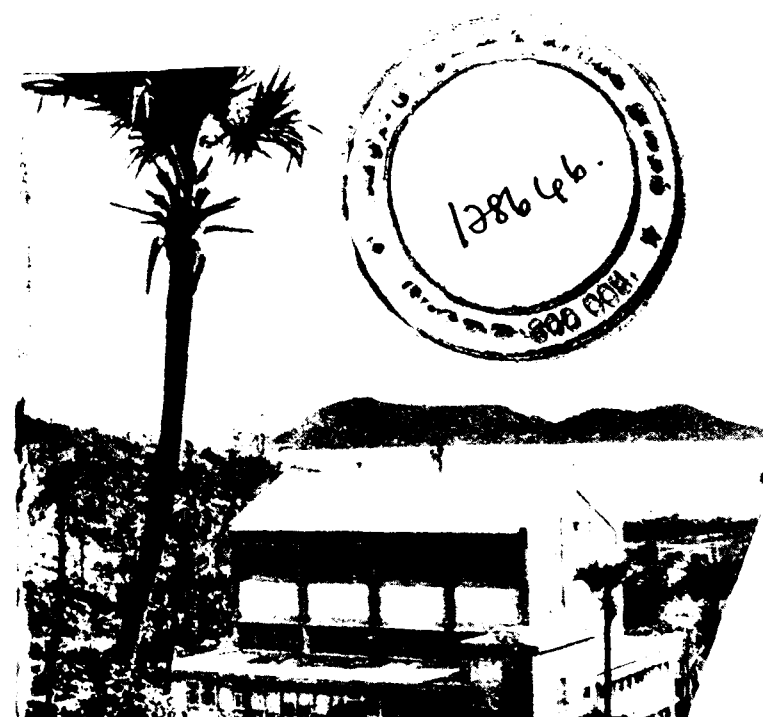
- (1) To record the accomplishments and achievements of our employees, their joys and sorrows, so that our other friends like our customers, shareholders and neighbours may get to know our family better;
- (2) To encourage in our employees pride in workmanship and the high quality of our products;
-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



CONTROL ROOM: All operations are controlled from the desk in the foreground. In the picture, Dr. H. J. Bhabha, Chairman of the Atomic Energy Commission (right), discusses problems with members of his staff, a little before the reactor went into operation

PRIME MINISTER JAWAHARLAL NEHRU gave an assurance to the world that India would never use atomic energy for "evil purposes" when he inaugurated the Atomic Energy Establishment and Asia's first atomic reactor on January 20.

Dr. H. J. Bhabha, Chairman of the Atomic Energy Commission, addressing the gathering said that a plentiful supply of energy was the first requirement of modern civilization. India, with only about 110 tons of coal in the ground per head of population, small known reserves of oil, and an estimated hydro-electric potential of under 40 million kW would be unable to attain a standard of living equal to that obtaining in the industrially advanced countries. Fortunately for India, known reserves of uranium and thorium in the country were equivalent to more than 15 times its reserve of coal. In the period immediately ahead, the development of atomic energy would depend upon its competitiveness with conventional sources of power. It was still too early to make precise estimates of



THE REACTOR BUILDING at Trombay: India ushered in the nuclear age in Asia when its first experimental reactor became critical in August last year. In the background is the heavy elements laboratory under construction

the cost of electricity generated from atomic energy, since only one large-scale atomic power station had yet gone into operation in the world at Calder Hall in the United Kingdom.

Discussing the benefits of atomic power as compared with conventional power, Dr. Bhaba said that if India was not to lose further ground in the modern world it was necessary to set up some atomic power stations within the next five years to produce plutonium for future power reactors in addition to producing electricity now.

A hall 100 ft. long, 30 ft. wide and 28 ft. deep houses the reactor. The actual atomic reactor consists of a rectangular tank 28 ft. long, 10 ft. wide and 28 ft. deep. A massive concrete wall 8 ft. 6 in. thick encases the tank.

The reactor has been named "Apsara", meaning a celestial damsel or water nymph.

Hirakud Dam: The inauguration of the giant Hirakud Dam on January 19, marks the culmination of the first stage of the project for harnessing the waters of the Mahanadi, Orissa's river of sorrow. The project will prevent the almost annual recurrence of disastrous floods and ensure steady water supply all the year round for nearly two million acres of land and much needed power for Orissa's growing industries.

Hirakud is said to be the longest dam in the world. The main dam is three miles long, thrown across four river channels between two hills and thirteen miles in addition,

formed by closing the wide gaps in the hills on the flanks.

The power house partly built at the foot of the dam in rear is 618 ft. long and 132 ft. wide. Just now it houses four units—two of 37,500 kW each and two 24,000 kW each. Two more units will be commissioned shortly.

The transmission system comprises 230 miles of single circuit 84 miles of double circuit 132 kV and 30 miles of 66 kV lines.

Power Engineers Conference: Power engineers from all over India gathered at Bangalore on Jan. 21 for a week-long conference to discuss measures to meet the country's mounting demand for power to match her economic and industrial plans.

In the absence of Mr. G. L. Nanda, Union Minister for Irrigation and Power, who ought to have inaugurated the Conference, Mr. A. B. Shetty, Mysore's Minister for Public Health, read his speech.

Mr. Nanda said that "our load surveys worked out on the basis of past experience turned out to be under-estimated and our targets had to be revised upwards." As an experimental measure, he said, that the Atomic Energy Department was considering as an experimental measure the question of setting up a nuclear power station of about 140,000 kW capacity.

Referring to power development in the various regions in the country, Mr. Nanda said that development had not been uniform and there was much to be done in the interest of regional justice.

Mr. Veeranna Gowd, Minister for Public Works and Electricity in Mysore, welcomed the delegates.

About 120 engineers of Electricity supply undertakings, both from the public and private sectors, attended the conference.

Commonwealth Conference in New Delhi:

The hope that the deliberations of the Commonwealth Standards Conference on such subjects as metric and inch-pound systems would provide a basis for compromise that might lead to a world agreement was expressed by Mr. Morarji Desai, Minister for Commerce and Industries, at the third session of the Conference held in New Delhi in the third week of January.

The Conference was attended by over 120 experts from Commonwealth countries, including the U.K., Canada, Australia, New Zealand and India.

It discussed ways and means of securing uniformity in industrial standards and standardization policies in the interest of inter-commonwealth relations and trade. India's proposed change-over from the inch-pound to the metric system figured in the discussions.

Opening statements on behalf of leaders of delegations from Pakistan, Australia, Canada and the U.K. were made at the session.

Mr. Ziauddin (Pakistan) said India's experience with the metric system would be of great interest to Pakistan.

Mr. A. L. Stewart (Australia) said if standards within the commonwealth countries could be aligned to the greatest possible extent, they would have gone a long way towards achieving technical understanding in the international sphere.

Mr. J. S. Cameron (Canada) said the wonderful progress made during the last five years by India augured well for her Second Five-Year Plan.

Mr. H. A. R. Binney (U.K.) said it should be remembered that over 50 per cent of export trade and 40 per cent of her import trade was within the Commonwealth.

Dr. L. C. Verman, Director of the Indian Standards Institution, which was playing host to the Conference, said in the Commonwealth there were "differences and divergences" on many matters, but in the matter of standards, Commonwealth countries were almost always able to find solutions to their problems.

Mr. Nehru, in a message to the Conference, said it was of great importance that Indians maintained proper and accurate standards in the goods they produced, as in their private and public lives.

Mr. Desai gave an "at home" to the delegates to the conference. V. G. G. Nayar, General Manager, attended the conference as an ISI delegate.

technical notes

Insulated Aluminium Conductors*

E. G. STURDEVANT

MEMBER AIEE

THE EXCELLENT ELECTRICAL conductivity, relative abundance, and reasonable price of aluminum justify its consideration for use in insulated conductors. It has a conductivity of 61 per cent of copper, far exceeding that of the other more abundant metals that might be considered as conductors, such as iron (12.4 per cent) and magnesium (38.4 per cent). It is by far the most abundant metal, making up about 8.5 per cent of the earth's crust as we know it. Ores from which it may be extracted commercially are widely distributed. Its price per pound at the present time compares favourably with that of copper.

The use of aluminum as a conductor of electricity is not new, but the use of aluminum as an insulated conductor is relatively new.

Following World War II, largely because of the greatly expanded facilities for producing aluminum, the price of aluminum per pound became lower than that of copper. This and the critical shortage of copper at the time resulted in rapidly expanding interest and activity in the use of aluminum in insulated conductors. As a result of this activity,

Underwriters' Laboratories' Inc., in September 1946, approved the use of insulated aluminum conductors in building wires in size 12 AWG and larger. Following the practice used in ACSR, harddrawn aluminum was specified in this approval. It was thought that wire of this hardness was required to produce an insulated conductor that would pull into conduits satisfactorily.

Practical experience with these harddrawn aluminum insulated conductors, particularly in the small, solid sizes, showed that they frequently broke when they were bent for attachment to terminals. To correct this tendency to break, consideration was given the use of semi-annealed aluminum for building-wire purposes. Samples of insulated conductors, made with aluminum having a tensile strength of from 17,000 to 22,000 pounds per square inch, have been thoroughly tested, and in 1951 were approved by Underwriters' Laboratories, Inc. They have sufficient breaking strength for pulling into conduits. They compare favourably with soft copper in their ability to withstand repeated flexing. Aluminum with this degree of hardness is now generally used in insulated conductors.

*Courtesy: *Journal of the American Institute of Electrical Engineers.*



Commonwealth Standards Conference. V. G. G. Nayar can be seen second from right.

Mr. Morarji Desai, Union Commerce Minister, was at home to the delegates of the commonwealth standards conference. Picture shows V. G. G. Nayar with the Minister



Table I. Electromotive Series, Volts.

Aluminum	...	...	...	...	...	1.70 ()
Zinc	...	...	...	...	...	0.7618
Iron	...	...	...	...	...	0.441
Cadmium	...	...	...	...	...	0.401
Tin	...	...	...	...	...	0.136
Lead	...	...	...	...	...	0.122
Hydrogen	...	...	...	...	...	0.00
Copper	...	...	...	...	...	0.344 (—)

Table II. Physical Properties of Semi-annealed Aluminum and Annealed Copper.

	EC Grade Aluminium	Annealed Copper
Specific gravity	2.70	8.89
Pounds per cubic feet	169	555
Pounds per 1,000 feet per CM	0.00091	0.003
Specific heat, calories per gram per C	0.226	0.092
Thermal conductivity, calories CM ² CM C seconds	0.520	0.923
Melting point, C	657	1,083
Thermal expansion, per C	23.0 · 10 ⁶	16.4 · 10 ⁶
Tensile strength, pounds per square inch	17,000 to 21,000	35,000 to 38,000
Elongation per cent, 0.025 inch to 0.460 inch	5 to 15	30 to 40
Underwriters' Laboratories flexibility, bends to break, 0.081-inch wire	16	16

Comparative Properties of Copper and Aluminum.

The following paragraphs discuss briefly the more important chemical, electrical, and physical properties of copper and aluminum and the significance of the performance of these metals in insulated conductors.

CHEMICAL PROPERTIES

Aluminum oxidizes readily in air which results in the formation of a thin layer of oxide on its surface. This oxide film is impervious to many materials, including oxygen, and therefore prevents further oxidation. It is also rather insoluble and hence increases the resistance of aluminum to corrosion. The film, however, is a good electrical insulator and must be removed or destroyed in soldering or terminating operations.

The positions of aluminum and copper in the electromotive series (Table I) shows that a potential of about 2.00 volts can develop when the two metals are in contact in the presence of an electrolyte. Under such conditions aluminum may enter solution. These conditions may develop to some extent when uncoated copper connectors are used with aluminum conductors in wet locations, and may result in high resistance contacts. It has been well established that harmful corrosion does not occur with copper connectors on indoor (reasonably dry) installations, particularly if No-Ox-Ide, Penetrox-4, or other suitable joint compound is used, and the copper connectors are coated with tin, zinc, or cadmium. It will be noted from Table I that these metals are intermediate between copper and aluminum in the electromotive series.

PHYSICAL PROPERTIES

Table II shows the more important physical properties of semi-annealed aluminum, together with the corresponding properties of annealed copper. The properties given for aluminum, except for tensile strength and elongation, also apply to hard drawn aluminum. Hard-drawn aluminum has a tensile strength of 24,000 to 29,000 pounds per square inch and an elongation of about 1.5 per cent.

SPECIFIC GRAVITY

The specific gravities show that aluminum has a weight of about one-third that of an equal volume of copper. This results in 600-volt insulated aluminum conductors having a weight of about 45 per cent of those of copper conductors of the same AWG size. For conductors with equal resistance (the aluminum being two sizes larger than the copper), insulated aluminum conductors weigh about 70 per cent of those of copper. These savings in weight result in lower shipping and installation costs.

SPECIFIC HEAT

The specific heat of copper is 0.092 and that of aluminum 0.226. Since copper weighs 3.3 times the weight of an equal volume of aluminum it follows that the heat storage capacities of equal volumes of copper and aluminum will be in the ratio of 0.092 to 0.068. That is, a copper conductor will store about 35 per cent more heat than an aluminum conductor of the same cross-sectional area per unit length. For the conductors of equal resistance, the volume of the aluminum is about 1.59 that of the copper conductor. The heat storage capacities of copper and aluminum conductors of equal resistance will thus bear the ratio of 0.092 to 0.068 · 1.59 or 0.092 to 1.07. The aluminum conductors will thus have about 16 per cent more heat storage capacity than a copper conductor of equal resistance. It thus follows that insulated aluminum conductors should carry somewhat larger short circuit currents than copper conductors of equal resistance without resulting in a temperature rise that injures the insulation.

THERMAL CONDUCTIVITY

The difference in thermal conductivity of copper and aluminum is appreciable but is probably of little importance except during the soldering or welding of splices and terminals and at high-resistance connections. The heat is not conducted away from such hot spots along an aluminum conductor as rapidly as along a copper conductor and hence somewhat higher temperatures may develop with aluminum.

MELTING POINT

It will be noted that the melting point of aluminum is much lower than that of copper. Aluminum conductors will therefore burn off at correspondingly lower temperatures than copper conductors when short circuits occur.

BURN-OFF CHARACTERISTICS

The aforementioned three characteristics, specific heat, thermal conductivity, and melting point, together with conductor resistance, determine generally the burn-off currents of insulated wires. Burn-off currents are those necessary to burn a conductor clear after various periods of time such as from half-a-minute to five minutes. Burn-off currents are particularly significant in cables used in underground networks, since they have a bearing on the settings of limiters and other circuit interrupting devices. The question thus arises as to how aluminum conductors compare with copper. Estimates of the burn-off characteristics of insulated aluminum conductors supported by some experimentally determined values indicate that they compare favourably with those of insulated copper conductors having the same resistance.

THERMAL EXPANSION

The greater thermal expansion, coefficient of linear expansion of aluminum means that with a given temperature rise, aluminum conductors will elongate somewhat more than copper conductors. The increase in length, however, is not sufficient to cause any harmful stress on terminals or insulation where

conductors are installed in conduits or ducts. This greater expansion of aluminum may produce a flow or creep of aluminum from copper compression fittings at high temperatures and result in a high resistance contact at low temperatures. For this reason, copper connectors for use with aluminum generally have longer bearing surfaces than those made for copper conductors. These longer bearing surfaces make possible fittings of adequately low resistance with less pressure than is required for the shorter fittings.

TENSILE STRENGTH

The lower tensile strength of aluminum would indicate that breakage might occur in pulling such wires in conduits. This, however, has not been found to be the case, probably because of the fact that an aluminum conductor pulls more easily because of less weight, than a copper conductor of equal electrical resistance. Furthermore, an insulated size 12 AWG aluminum conductor has about the same breaking strength as size 14 AWG copper conductor which has given satisfactory pulling results for many years.

FLEXIBILITY

Results obtained by Underwriters' Laboratories, Inc., indicate that size 12 AWG semi-annealed aluminum has about the same resistance to repeated bending as soft copper. This means, in general, that the flexibility of this aluminum compares favourably with that of soft copper. The flexibility of hard-drawn aluminum is similar to that of hard-drawn copper.

ELECTRICAL PROPERTIES

Table III shows that the volume conductivity of aluminum is 61 per cent of that of annealed uncoated copper. It is 63 per cent of the value of coated copper having a conductivity of about 97 per cent of the International Annealed Copper Standard (IACS). This means that for equal conductivity, aluminum conductors must be 100/63 or 1.59 times larger in area than coated copper. This is equivalent to about two AWG sizes.

The larger aluminum conductors have a somewhat larger current-carrying capacity because of their larger diameter and hence greater radiating surface. This is shown in column 3 and 6 of Table IV.

Where current-carrying capacity rather than voltage drop is of prime importance, the size of aluminum conductors may be selected on the basis of their current-carrying capacity. The National Electrical Code permits aluminum conductors to be operated at current-carrying capacities of 84 per cent of those given in Tables I and II, Chapter 10, of the Code for copper conductors. This 16-per-cent difference in current-carrying capacity is about compensated for by operating the conductor at 75 dec. C instead of 60 dec. C. Hence, an aluminum conductor insulated with a heat-resisting compound will have about the same current-carrying capacity as a copper conductor of the same size with Code insulation. It should be noted, however, that the current-carrying capacity of aluminum conductors, based on their resistances is about 80 per cent rather than 84 per cent as allowed by the Code.

Table III. Electrical Properties

	EC-Grade Aluminum	Annealed Copper
Mass resistivity, ohms meter gram, 20 C	0.07644	0.15328
Volume resistivity, ohms per mil. foot, 20 C	17.011	10.371
Volume conductivity, per cent IACS	61.0	100.0
Temperature coefficient of resistance, per degree centigrade, 20 C	0.00403	0.00393
Current-carrying capacity, insulated wires of equal size according to National Electronics Conference.	84	100
According to resistances	80	100

Aluminum conductors are insulated on conventional plastic and rubber insulating equipment. All the usual insulating compounds, including thermoplastic insulation generally used on copper conductors, can be used on aluminum.

The insulation thicknesses and test voltages are the same for aluminum conductors as for the corresponding sizes of copper conductors. The same types of coverings and covering thicknesses are used, although there is a possibility of less damage to insulation and covering during installation with aluminum than with copper conductors, because of their lighter weight.

Splicing and Terminating Aluminum Conductors

Splicing and terminating of aluminum cables are readily accomplished by the same general methods as those used for copper. There are certain differences between the two metals which make necessary the use of different materials and the exercise of certain precautions when terminating and splicing aluminum that are not necessary with copper. The oxide film on the surface of aluminum is insulating and hence, to avoid connections with high resistance, must be broken down mechanically on compression fittings or removed by special fluxes at soldered joints or fittings. The difference in thermal expansion of copper and aluminum makes advisable special precautions to insure tight fitting between the conductor and copper compression fittings.

WELDING

The fittings should be made of EC-grade aluminum. Suitable welds can be made by inert gas (argon), oxy-acetylene, or electric welding. In oxy-acetylene welding it is necessary to use a flux. Inert gas welding is probably the most satisfactory method of joining or terminating aluminum conductors if conditions are such that it can be used.

Table IV. Equivalent Aluminum and Copper Conductors, Based on Voltage Drop on Three Single Conductors in Magnetic Conduit, 80 Per Cent Power Factor, 75 C. Copper Temperature and Corresponding Current Carrying Capacities at 30 C. Ambient.

Copper Conductors			Aluminum Conductors		
Size	Voltage Drop Phase to Phase per Ampere per 1,000 Feet	Current Amperes	Size	Voltage Drop Phase to Phase per Ampere per 1,000 Feet	Current Amperes
1	2	3	4	5	6
14	4.67	15	12	4.75	17
12	3.00	20	10	3.02	25
10	1.86	30	8	1.90	38
8	1.21	45	6	1.21	55
6	0.793	65	4	0.790	71
4	0.514	85	2	0.509	97
2	0.341	115	1 0	0.336	126
1 0	0.232	150	3 0	0.228	168
2 0	0.193	175	4 0	0.190	193
3 0	0.163	200	250	0.169	214
4 0	0.138	230	350	0.134	260
250	0.126	255	400	0.124	282
350	0.104	310	500	0.108	319
400	0.097	335	600	0.098	353
500	0.088	380	750	0.089	399
600	0.082	420	900	0.082	437
750	0.075	475	1,000	0.080	458

SOLDERING

The same general practice is followed in soldering aluminum as in soldering copper. The oxide film on aluminum is destroyed by applying Alcoa 64 flux and by heating carefully to a temperature not exceeding 415 degrees Fahrenheit. This is the temperature at which the flux decomposes and at which it changes color. The conductor is then treated with molten Alcoa 804 solder, after which it is handled in the same way as copper. Other special fluxes and solders are available for use with aluminum conductors.

The relative abundance, low price, and general properties of aluminum make it a logical alternate to copper for use in insulated conductors. With suitable compensation for

conductivity, aluminum can be used in all commercial cable construction. Large quantities of insulated aluminum power and control cables are giving satisfactory service. With the exercise of certain precautions made necessary by the special properties of the metal, insulated aluminum conductors can be satisfactorily joined and terminated by the same general methods that are used for copper conductors.

Our Family

We said welcome to . . .

Probationers—**S. Narayanan Nair** (Asst. Engineer, Mech.), **B. V. Ramanamoorthy** (Trainee Foreman), **K. N. Gopalakrishnan Nair** and **K. P. Mukundan** (Supervisors, Electrical). **Kainikkara M. Govinda Pillai** (Supervisor, Security and Protection), **N. Satheesa Menon** (Accounts), **N. R. Pillai** (Head Guard), **P. K. Chandrasekhar** (Electrical), **P. Gopalakrishna Panicker**, **S. Krishnan**, **M. Yohannan Panicker**, **A. M. Gopalakrishnan Nair**, **N. S. Sreedharan Pillai**, **B. Vincent D'Cruz**, **P. K. Krishna Pillai**, **K. Krishnan Nair**, **M. R. Chandrasekharan Nair**, **K. C. Mathew**, **V. Madhavan Nair**, **T. R. Krishnan**, **V. M. Abraham** and **K. Velayudhan Nair** (Guards).

Apprentices—**A. Shahul Hameed**, **A. Rajan Ninan**, **M. Velu Pillai**, **K. Sasibhooshanan Nair**, **T. K. Ramachandran Nair**, **P. Muraleedhara Menon**, **K. Subramonia Iyer**, **V. K. Sivasankaran Nair** and **M. Raman Nair**.

We said farewell to . . .

K. Govinda Pillai (Head Guard); **T. K. Ipe** (Junior operator, Die Shop); **M. Kumaran Nair** (Guard) and **K. Raghavan** (Guard).

Best of luck to **K. Ramakrishnan Nair** who has been posted as our Project Engineer at Hirakud and to **K. N. Gopinathan Nair**, Accounts, who has been posted as Cashier. Both were given rousing sendoffs at several parties held in their honour.

Births . . .

To the wife of :

G. **K. Warrior**, Supervisor, Safety, Salvaging and House Keeping, a daughter; **N. N. Iyer**, Bills, a daughter; **K. Sreedharan Pillai**, Rod Mill, a daughter; **C. Gopinathan Nair**, Cable Mill, a son; **K. Thankappan Pillai**, Timber Handling, a son; **N. Chellappan Pillai**, Timber Handling, a son; **A. Carlese**, Rolling Mill, a daughter; **M. Chellappan Asari**, Reel Shop, a son; **O. Padmanabhan Asari**, Reel Shop, a son; **R. Neelakantan Asari**, Reel Shop, a daughter; **P. Narayana Pillai**, Security, a daughter; **M. Thankappan Asari**, Reel Shop, a daughter; **M. P. Kuttappan Asari**, Reel Shop, a daughter; **K. K. Raman**, Machine Shop, a daughter; **M. Antony**, Gl. Office, a son and **S. Damodaran**, Gl. Office, a daughter.



George D'Cruz and Ida, daughter of Valerian D'Cruz



OUR congratulations and good wishes go the following couples.

- 1. **K. Parthasarathy**, Shipping, with Miss Leela.
- 2. **Vasudevan, Jr.** Mechanic, Mech. Mnce., with Miss Anandavally.
- 3. **Ramachandran Nair**, Clerk, Planning, with Miss Rajamma.
- 4. **Sivadas**, Regd. Office, with Miss Chandramathi.
- 5. **Leela**, daughter of **T. J. John**, Attender, Works Supdt.'s Office with Mr. Johnson.
- 6. **Ida D'Cruz**, daughter of **V. D'Cruz**, Chargeman, Electrical, with Mr. George D'Cruz.
- 7. **Grace Mathews**, Stenographer, with Mr. Joseph Fenn.
- 8. **Purushothaman Nair**, Files attender, Gl. Office, with Miss Sailaja Devi.
- 9. **Ramachandran Nair**, Stenographer, with Miss Ratnamma.
- 10. **N. Kumaraswamy Pillai**, Fitter, Machine Shop, with Miss Parvathy Bai.
- 11. **T. Cheriyan Panicker, Jr.** Operator, Cable Mill, with Miss Aliyamma.
- 12. **P. Prabhakaran Kartha, Jr.** Draughtsman, Engineering Section, with Miss Santakumari.
- 13. **Lakshmanan**, son of **Mr. A. G. Senapathy Mudaliar**, our Bangalore Representative and **Sarasvathi**, daughter of **Mr. S. V. Subramaniam**, Managing Director, Air-Flow Transport.



Johnson and Leela



Sarasvathi and Lakshmanan, son of Mr. A. G. Senapathy Mudaliar, our Bangalore Representative



K. Ramachandran Nair and Rajamma



P. K. Parthasarathy and Leela



M. Sivadas and Chandramathi



K. V. Marshally

The view is on the house !

An employee whose house commands, among other things, a view of our works is **K. V. MARSHALLY**, Foundry Operator. He is a native of Kanjiracode, a suburb of Kundara, and from his house he could have a fine *dekko* of the factory premises.

Marshally came to ALIND after five years of service with the Government Ceramic Factory, Kundara. A man of irrepressible enthusiasms, he takes a prominent part in organising celebrations and functions in our little township.

As a real son of the soil, his attachments are local, purely local. He is strongly of the view that the prosperity of Kundara is closely connected to that of ALIND. A father of three kids, Marshally revels in the company of children.

* * * * *



Valerian D'Cruz

He's a real live wire and father of twelve !

VALERIAN D'CRUZ can play on, or fiddle with, the strings of a violin, banjo or mandola as well as he can with . . . just strings or wires ! He is a Chargeman in our Electrical



Section. Having behind him an experience of 27 years (of which eight belongs to ALIND) he is regarded as a local authority on the subject of electrical wiring.

Forty-three-year old D'Cruz carries his years lightly. To look at him, you'd take your oath that he is twenty-five or on second thoughts . . . twenty-five !

Musie is his second love (Bach, Beethoven and all that) his first, of course, being his family wife and a dozen kids. *Pater familias* D'Cruz has two ambitions in life : (a) Aluminium Industries must grow into the number one company of this country ; (b) the little D'Cruzes should develop into useful citizens of the Union. May his dreams come true !

Stilt-walking is his hobby

T. J. JOHN, Attender, Works Superintendent's Office, or, 'Vadakkan' (which means a man from the North) as he is affectionately known, is another ALINDER who is the head of a big family. He is the father of ten children. His eldest daughter Leela was married only some months ago, and you must then see his face—he practically flood-lit the whole place with his broad grin !

Unassuming and gentle to a fault, John is the conscience-keeper and the confidant of many of our men.

Having spent the best years of his life as a coir-matting weaver, John's one ambition in life is to start a coir-matting business himself some day. John can walk beautifully on stilts.



T. J. John



P. Rajagopalan

Slow cyclist, but fast worker!

P. RAJAGOPALAN, Machine Shop, is a most popular ALINDER. As a first-class craftsman, and as one who has made some excellent suggestions he has earned for himself both good name and "riches."

As a slow-cycle racist, he cannot remember an event which he had entered for, and in which he had not wheeled away with the prize. A voracious reader of both technical and non-technical books, he is a great music lover too. His hobby is the repairing of instruments of all kinds, including watches. It cannot, however, be said of him as of another amateur watch-repairer that he dismantled more watches than he ever knew how to put together!

His ambition? To run a well-equipped engineering workshop of his own. Here's to its realisation!

Blueprint Reading for artisans

Classes inaugurated

A FREE BLUE PRINTING READING class was started in Kundara with effect from December 17, 1956.

Inaugurating it Mr. P. E. Gopala Menon, Junior Field Officer, Small Industries Service Institute, Trivandrum, said:

"A blue print is copy of a working drawing. Engineering drawing



K. Kunju

He unfurled the national tri-colour on Republic Day

K. KUNJU, Diesel Generator Driver, belongs to a former generation which had more pep, go and drive and what it takes to make a man a he-man. Despite the "all-aluminium" character of his head, he is 57—he has the explosive energy of a young man in his twenties. Somewhat of the nostalgic type, oft, in the still night, ere slumber's chains bind him, fond memory brings back to him, the light of other days. Our industrial civilization is all right, he says, but it should not carry with it all its present conflict. Kunju has been on the winning sides of tug-of-war for three years in succession (1954—1956). His chief off-work interests are smithy and carpentry. He also likes to read devotional literature.

This Republic Day, Kunju, as the oldest ALINDER, hoisted the national flag.

is a graphic language, and like any formalised language, this language has also its set of rules."

Explaining how blue prints are made, Mr. Menon dwelt on the imperative need of all artisans being able to think in terms of three dimensions, and to visualise a solid by its representation on a flat plane.

Our Inspecting & Testing Foreman

K. SEETHARAMAN

A THUG BY EXTRACTION, A Tamil by adoption, and a Malayali by domicile, K. Seetharaman is a cosmopolitan, both by temperament and upbringing. He is a Physics Graduate of the Madras University—a product of the Loyola College. He has also passed in Section 'A' of AMIE (India).

Prior to joining us in 1950, Seetharaman served for a year as a Demonstrator in a College in Quilon.

Seetharaman is a gifted and many-sided personality. Apart from being a linguist—he can speak at least four languages fluently—he is a first-rate sportsman, his specialities being Badminton and Table Tennis. Seetharaman himself thinks that his athletic abilities are nothing much to write home lyrically about, but those who have seen him in action on our playing fields would beg to differ from him. He has also a considerable musical and histrionic talent. Particularly in skits and sketches, he scintillates.

Seetharaman utilised the opportunity of his preparation for the IAS examination for making a deep study of the Second Five-Year Plan, particularly the various multipurpose projects. He believes that the proper study of an Indian is India.

A memory which he cannot willingly let die is the stay of His Holiness Jagatguru Sri Sankaracharya of the Sringeri Mutt in his house at Quilon.



K. Seetharaman

Seetharaman is a camera fiend too, having a weakness for 'Agfa Isolette.'

'Time must have a stop', says Shakespeare somewhere; so should an essay about even one who is as gifted as Seetharaman. That Shakespearean phrase reminds us that it is the title of a novel by Aldous Huxley. Who, incidentally, is Seetharaman's favourite author.

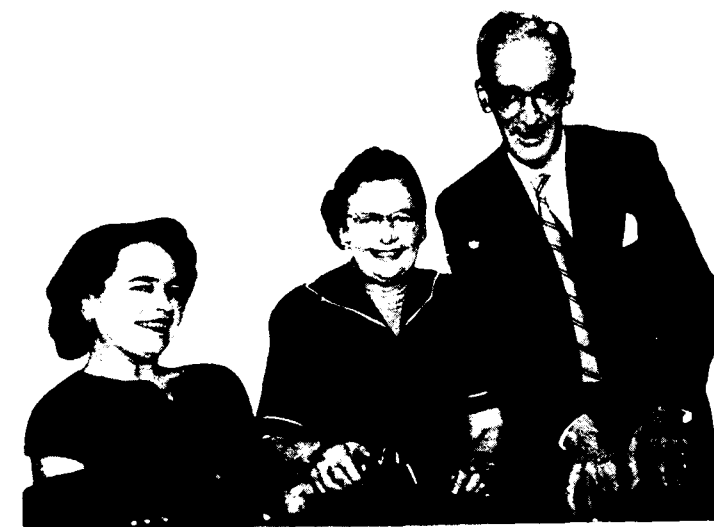
A young man devoted to his work, bright, well-informed and well-behaved, Seetharaman is as hot a favourite with Government Inspecting Officers as he is with his colleagues and ALINDERS.

(Continued from Col. 3)

As daughter Diana observed in a limerick she sent to her dear 'ole daddy on his sixtieth birthday, Gorton is, for his age, really as sprightly as a laddie, his chief vice being an open tea caddy! His subsidiary vice is crosswords. The Sunday Hindu Crossword which is admittedly no child's play, Gorton can do inside of thirty minutes. Other Gorton interests: gardening, cycling, swimming and reading, particularly, Shakespeare.

A gentleman to his finger tips, the nearest practical approximation we have seen of Cardinal Newman's idea, a genial, jovial type, one takes to Gorton the minute one gets to know him.

Here's to his long life and happiness—lots and lots of it!



Mr. Charles G. Gorton (third from left) Mrs. Gorton (second) and Miss Diana Gorton

OUR "LONDON OFFICE"

—CHARLES G. GORTON

SWEETEST SHAKESPEARE FANCY'S child, warbling his woodnotes wild said, among several other things, "'Tis not in mortals to command success, but we'll do more—deserve it". Which is the motto of Mr. Charles G. Gorton, whom we are proud to call our London Representative.

Mr. Gorton and V. G. G. Nayar are "buddies" in more than one respect. More than anything else, both are sons of Police Officers, and both worked for the same company, before they started working for ALIND.

Educated at West Ham Municipal Technical College, Gorton first took service (1911) with India Rubber, Gutta Percha and Telegraph Works Limited. During World War I, he saw active service in Mesopotamia. Rejoining his old firm in 1919 as Assistant Cable Tester, he was promoted to the position of Assistant Departmental Manager (Cables) in 1924.

Mr. Gorton later worked for two years (1934-36) for Metropolitan Electric Cables and Construction Company Limited as Works Superintendent, Paper Cable Section. He joined Crompton Parkinson Limited, Derby Cables Works, in 1936 as Manager, Rubber Cables Section. A noteworthy feature of his service

with this Company was that a new plant was installed (under his direction) to double output.

In 1939 Gorton accepted appointment as Manager, Scottish Cables Ltd., Rubber Cables Section.

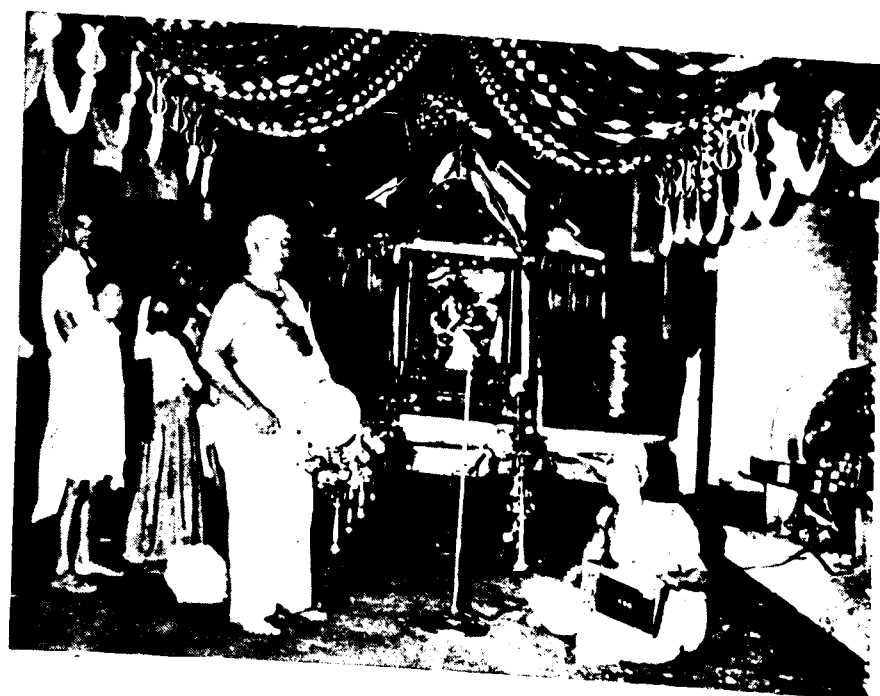
In September of the year, he was recalled to His Majesty's Forces, and later transferred to the British Ministry of supply as Technical Assistant, Cable Planning Section.

In 1943, Mr. Gorton accepted the position of Works Manager of National Insulated Cable Company of India, Limited, Calcutta. He supervised the purchase of plant and machinery for the project in the United Kingdom, came to Sharnagar in 1945, trained operatives, and got the factory into production of V.I.R. cables.

Gorton is now operating as a Purchasing Agent and Consultant to the electric cable manufacturing industry. The erection and commissioning of our new covered conductors plant was largely his work.

Mr. Gorton has a deep and abiding love for India and her people—having served by their side in war and worked by their side in peace. He has no wish to retire, and would rather wear out than rust out.

(Continued on Col. 1)

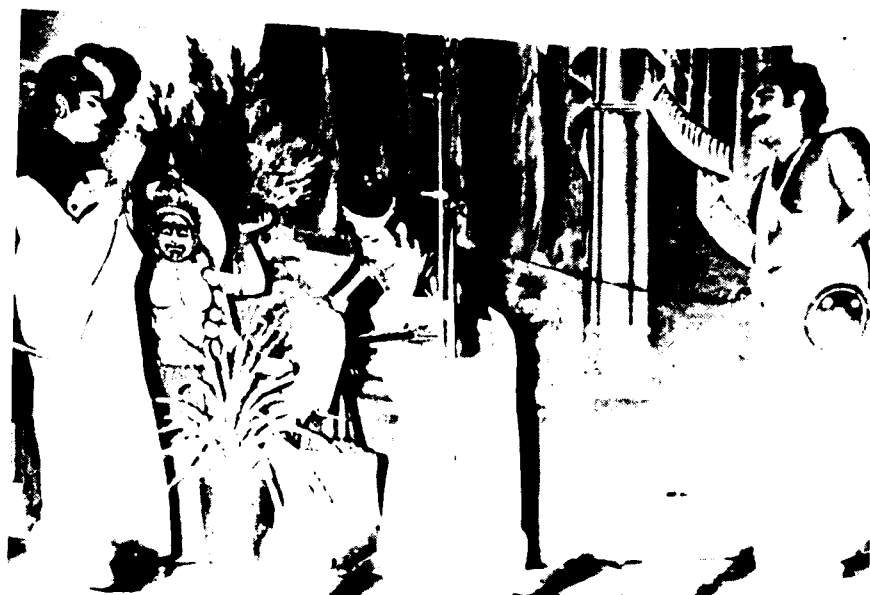


Members of the Kilikollur Sree Devi Natana Kala Samiti gave a dance recital



An artiste in the pensive mood of Lord Siva, the god of destruction

Radha-Krishna dance



An interesting moment in Elayadathu Rani, a historical play, staged on Ayudha Puja Day

AYUDHA PUJA
Evoor Sankararama Iyer rendered songs from Geeta Govinda accompanied on the edacka, a percussion instrument



Ayudha Puja

DEVOTIONAL SINGING, DANCE AND DRAMA MARK A MEMORABLE TWO-DAY FUNCTION.

OCTOBER 13TH AND 14TH, 1956, were important dates in the Hindu calendar. The first was *Ayudha Puja* or *Saraswati Puja* day, the day on which worship is offered to Saraswati, the goddess of knowledge and wisdom, and the second *Vijayadasami* day, a sort of V.E.F. day, F.F. standing for 'Evil Forces' and 'V' of course standing for Victory.

ALIND celebrated *Ayudha Puja* with its wonted splendour. As usual an artistic, little *mandap* was put up, and in it was installed a large-size picture of Saraswati. Puja began promptly at 8 a.m. in the presence of a large gathering of employees. Evoor Sankararama Iyer, a great exponent of *Geeta Govinda* the Song Divine, rendered several verses from it, accompanied on the *edacka*, a percussion instrument. In

the evening, there was a dance recital by the members of the *Kilikollur Sree Devi Natana Kala Samiti*.

On the second day, we had the usual *Aksharasloka* contest. T. A. Narayanan Nair, Machine Shop, was the winner. N. Neelakanta Iyer, Bills, was the runner-up.

In the *Ayudha Puja* quiz competition, three people tied for the first prize—N. K. B. Nair, N. Vasudevan and A. V. Thomas. Prof. G. Vaidyanatha Iyer of Mar Evaneos College, Trivandrum, a noted Malayalam scholar, presided at the literary convention held in the evening. Mr. Iyer said that a proper study of the classics was very necessary for all aspirants to literary fame and deprecated the tendency of a certain section of society which decried everything old.

Mr. M. Krishnan Nair, Sanskrit College, Trivandrum, deplored the fact that the stuff of the dreams of some of the so-called progressive writers consisted only of blood, sweat and tears.

V. R. Parameswaran, an eminent archaeologist, the third speaker, referred to the historical importance of Kundara.

A poets' symposium was, also, held in the evening.

P. Sivasankaran Nair, Payroll, was the winner, G. K. Warrior coming second.

At night, the members of *Kalanilayam*, Trivandrum, staged *Elayadathu Rani* a historical play. It was a great success and very well received.

AYUDHA PUJA:
Mr. M. Krishnan Nair addresses the literary section meeting. Seated by his side are Mr. V. R. Parameswaran Pillai and Prof. G. Vaidyanatha Iyer





Prasad, son of Mr. Idicula

Christmas Party

WHOEVER IT WAS THAT SAID 'Christmas comes but once a year,' was not talking turkey! He didn't know his onions, and he certainly didn't know his Alinders!

Santa Claus obligingly had a date with our little 'uns on December 31.

A highlight of this year's party was that Mr. P. K. Veeraraghavan Nair, the well-known 'Radio Uncle' of All-India Radio, Trivandrum, was there in the flesh, instead of just being just a distant, etherialised voice.

As twilight came, and along with it Father Christmas, (Tom Levario to you) to the venue of the party - the Dormitory Quadrangle—there was such to-do among the up-and-coming.

Earlier, there was a Baby Show in which at least 75 children took an active, or is it passive, part.

In the category for "those under two years" Prasanna, daughter of P. K. Varadarajan Pillai, Office, walked away, rather crawled away,

with the first prize. In the category of "those between two and four years" an outsider, Prasad, son of Mr. M. Idicula, Advocate, Quilon, romped home a winner.

The judges were Dr. (Mrs.) Kamala Ramaier, a well-known obstetrician and paediatrician and Dr. S. D. Edwards of the local L.M.S. Hospital.

The chief guest of the evening, Rev. Father John, had some kind things to say about ALIND. It was important, he also said, that parents paid as much attention to the minds of their children as they did to their bodies, as the children of today were the citizens of tomorrow.

Radio Uncle "Veeran" asked the children to learn to be smart and remain smart *always*. "You must be pictures of health and you must cultivate pleasant manners", he advised them.

Bhagyam, daughter of K. R. Sankaranarayanan, as Lord Krishna and Kannan, son of V. G. G. Nayar as Radhika, Krishna's girl friend!



Participants in the Children's Fancy Dress contest



A section of the crowd of children that listened with rapt attention to their "Radio Uncle"



Tom Levario as Father Christmas handing a present to Kannan



Rev. Father John, Chief Guest, at the Christmas Party

Fancy dress, this year, attracted an unusually large number of entries. Impersonations sought to be pulled on us included Radhika, that eternal charmer, (Krishna's girl friend), Lord Krishna himself complete with his divine flute, a ghost calculated to give you the creeps, a bloody butcher, a brahmin widow bent on pilgrimage (*bent* is right) and a *sanyasi* in sack cloth and ashes.

Santa had a job picking his prizes from the present-bedecked Christmas tree, but it 'lesseth' him that gives—there is one less when you give away one! There were as many as 400 items to be given away—mechanical toys, toffee-tins, dolls, bunnies and then what-have-you.

We had nearly forgotten to throw in the sports part in this story. In the morning we had various kinds of races for the children like Running, Lime & Spoon, Biting-the-bun, Blindman's Buff and Threading the needle.

In the Tug-of-war, the boys avenged their defeat of last year at the hands of the girls. Male honour now stands vindicated.

The party was voted by one and all—Alinders and guests—as one of our best successes of 1956.

PRIZE WINNERS

Baby Show :

Under two years—

Prasanna, daughter of P. K. Varadarajan Pillai—	...	I
Sunder, son of N. Neelakanta Iyer—	...	II

Between two and four—

Prasad, son of Mr. M. Idicula, Advocate, Quilon—	...	I
Krishna Kumar, son of K. Ramakrishnan Nair—	...	II
Jameson, son of M. V. Johnson—	...	II

Fancy Dress :

Kannan, son of V. G. G. Nayar (<i>Radhika</i>)—	...	I
and		
Koshy, son of M. P. Mamman (<i>Ghost</i>)—	...	I
Bhagyam, daughter of K. R. Sankaranarayanan—	...	II



The Alind string band which was in attendance



Radio Uncle "Veeran"

Koshy, son of M. P. Mamman as a ghost

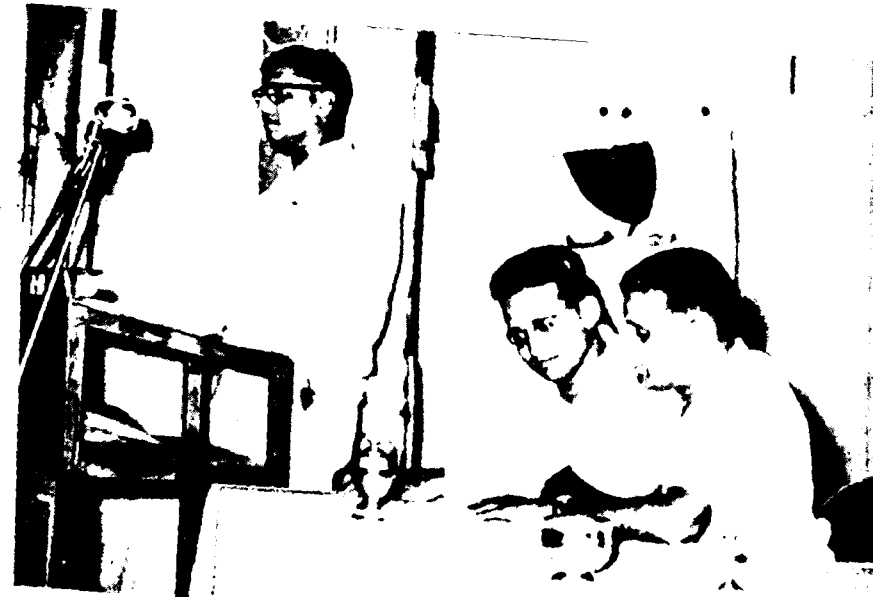


In the Children's tug-of-war contest, the boys pulled a fast one on the girls!



Six Candles for ARC!

1956—Year of all-round progress ; a new hall, a new game, several new members and new books to the library!



Mr. A. O. Oommen, the Chief guest, addresses members on Club Day

"FOR A CLUB ONLY SIX YEARS OLD, you have done remarkably well—judging by your record in sports and other activities and this beautiful club room you have," observed Mr. A. O. Oommen, Superintending Engineer, Electrical, Kerala Electricity Department, and our chief guest on the occasion of the birthday celebrations of the ALIND RECREATION CLUB on Feb. 19.

Welcoming Mr. Oommen and other guests, V. G. G. Nayar, President of the Club, said that Mr. Oommen had, apart from his academic and official attainments, mastered the secret of perennial youth.

Mr. Oommen said : " Club life is essential in the sense that it offers relaxation from one's labours and facilities for recreation and enjoyment. In a club, we meet fellow-members as equals, not as employer or employee, superior or subordinate".

Stressing the importance of electricity in the development of a country's economy, the speaker observed :

" The yardstick for measuring the development of a country is its per capita consumption of electricity. In India the figure is only 25 units, whereas in England, it is 960 units and in the United States of America, it is 2310 units."

Stating that as against the 1 per cent of villages electrified in the Indian Union, the percentage for

Kerala was 15.4, Mr. Oommen said : " The products of your factory, namely, ACSR and All-Aluminium conductors, have contributed in no small measure to this rapid development in this State of which you can legitimately be proud."

Mr. Oommen concluded : " It is a Club that lubricates and keeps going the greatest of all machinery, the human being."

Mr. Anandakuttan, another guest speaker, a noted Malayalam litterateur, observed that only by the harmonious combination of our great spiritual past and our material present, an exciting future could be built.

Earlier M. R. G. Menon, Secretary, presented the Annual Report, according to which, " the year 1956 should easily go down in the history of the Club as one of all-round progress."

Achievements for the year included :

- (1) Opening and occupation of the ALIND Recreation Hall ;
- (2) the addition of basketball to an already impressive roster of games ;
- (3) Rs. 2,500 worth of books (with another Rs. 2,000 worth of books at a not-too-distant date) ;
- (4) and the participation of members in outside tournaments.



A scene from the play put on boards by ALINDERS on Club Day



K. Thomas Muthalali and R. Gopalakrishnan in a skit staged on Club Day



Right top : An item from the dance programme

Centre : (1) K. M. Govinda Pillai in a piece of mono acting. (2) Another item from the dance programme. (3) A moment from the play staged on Club Day

The complete cast with V. G. G. Nayar in the centre



LIST OF PRIZE WINNERS IN THE CLUB DAY TOURNAMENTS 1956.

I. SINGLES

Badminton :

Winner - K. B. Pillai.

Runner-up - R. Velappan.

Tennikoit :

Winner - T. R. Raghunandan.

Runner-up - P. Sukumaran Nair.

Table Tennis :

Winner - T. G. Paul.

Runner-up - K. B. Pillai.

Caroms :

Winner - T. K. Radhamonie.

Runner-up - T. G. Paul.

Chess :

Winner - T. V. Ramachandran.

Runner-up - Abraham P. Jacob.

II. DOUBLES (OPEN)

Badminton :

Winners - K. B. Pillai and G. Sreenivasan.

Runners-up - O. C. Chacko and N. N. Iyer.

Tennikoit :

Winners - T. V. Ramachandran and T. K. Radhamonie.

Runners-up - K. B. Pillai and O. C. Chacko.

Table Tennis :

Winners - K. Seetharaman and T. K. Radhamonie.

Runners-up - K. R. Sankaranarayanan and T. G. Paul.

Caroms :

Winners - T. V. Ramachandran and T. K. Radhamonie.

Runners-up - V. B. Rozario and P. G. D. Panicker.

III. DOUBLES (LOT)

Badminton :

Winners - T. G. Paul and T. R. Raghunandan.

Runners-up - K. B. Pillai and Thomas Muthalaly.

Tennikoit :

Winners - T. K. Radhamonie and K. M. Ibrahim.

Runners-up - P. Sukumaran Nair and K. V. Lawrence.

Table Tennis :

Winners - T. G. Paul and N. N. Iyer.

Runners-up - K. B. Pillai and V. R. Vaidyanathan.

Caroms :

Winners - A. K. T. Nair and C. G. B. Pillai.

Runners-up - N. N. Iyer and G. D. Rozario.

IV. FOOTBALL

Winners : Thomas Antony, Rajan Philip, O. C. Chacko, C. S. K. Pillai, K. Seetharaman, S. Sanku Asari, K. Kunjan Pillai, K. V. Lawrence, V. Bhaskaran Nair, Thomas Panicker, and P. Rajagopal.

Runners-up : K. R. C. Nair (Planning), T. K. Radhamonie, M. K. C. Pillai, M. Shanmugha Das, Joseph Zacharia, P. M. Markose, K. B. Pillai, C. G. B. Pillai, Edwin Fernandez, and Thomas Muthalaly.

V. VOLLEYBALL

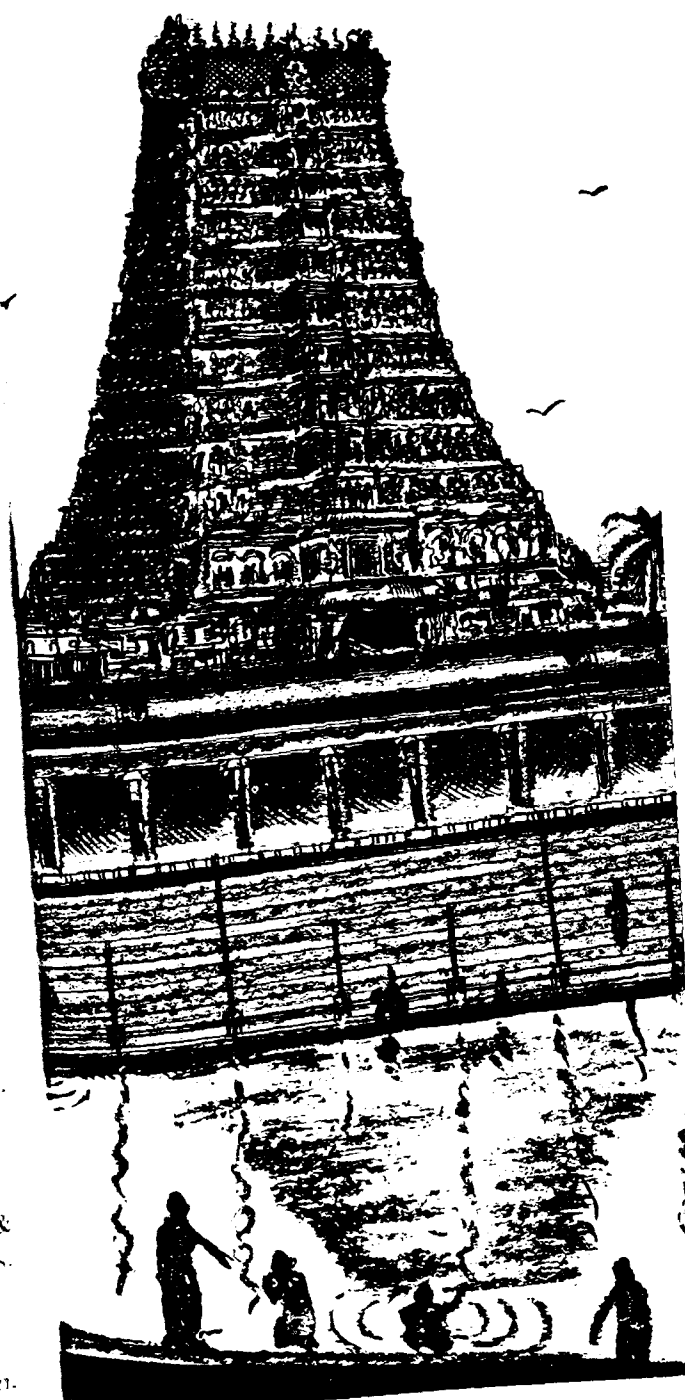
Winners - I. P. Radhakrishnan, Rajan Philip, K. N. Gopinathan Nair, K. R. C. Nair (Planning), K. Seetharaman, P. K. Chandrasekhar, I. G. Paul, C. Cherman, R. Gopalakrishnan, & P. Rajagopal.

Runners-up - M. K. C. Pillai, K. R. C. Nair (Stores), K. R. Sankaranarayanan, M. K. Varughese, Joseph Zacharias, S. Ravindran Nair, G. D. Rozario, P. M. Markose, V. Haritharan, and A. V. Thomas.

VI. BASKET BALL

Winners : I. G. Paul, K. Seetharaman, I. V. Ramachandran, K. Kunjan Pillai, Rajan Phillips, K. M. Ibrahim, K. G. Yatheendran, & M. Shanmugha Das.

Runners-up : T. K. Radhamonie, N. N. Iyer, K. C. Ramachandran, G. D. Rozario, P. Sukumaran Nair, N. Thomas Panicker, C. N. C. Kaimal, and P. Sivasankaran Nair (Planning).



**To Madura.
Trichy &
Mettur Dam**

A SMALL PARTY OF FIFTEEN ALINDERS LEFT QUILON BY THE Trivandrum Express one November morning on a tour of Madura, Trichy and Mettur Dam. The leader was, of course, our indefatigable T. K. Krishnan, Assistant Accountant (Costing). Trichy and Madura were on the itinerary, but Mettur Dam was a p.s. sort of thing. After *darshan* and worship at the Meenakshi temple we left for Trichy, reaching the place in the small hours of the morning.

It was a lucky coincidence that we hit Trichy on *Vinayaka Chathurthi* day, the annual day of worship of Vinayaka, the elephant god, and we were really very happy that it was given to us to visit the famous Rock Temple on this auspicious day.

In the evening we went to Srirangam and Tiruvanaikaval, nearby pilgrim centres.

We took the opportunity of our visit to Trichy to call on Mr. V. Seshasayee and pay our respects to him.

We left for Mettur Dam the same night reaching the place in the morning. First thing we did on arrival was to have a refreshing dip in the holy waters of that golden river, the Cauvery.

Later, we went round the works of the Mettur Chemical Industrial Corporation Limited, a sister company.

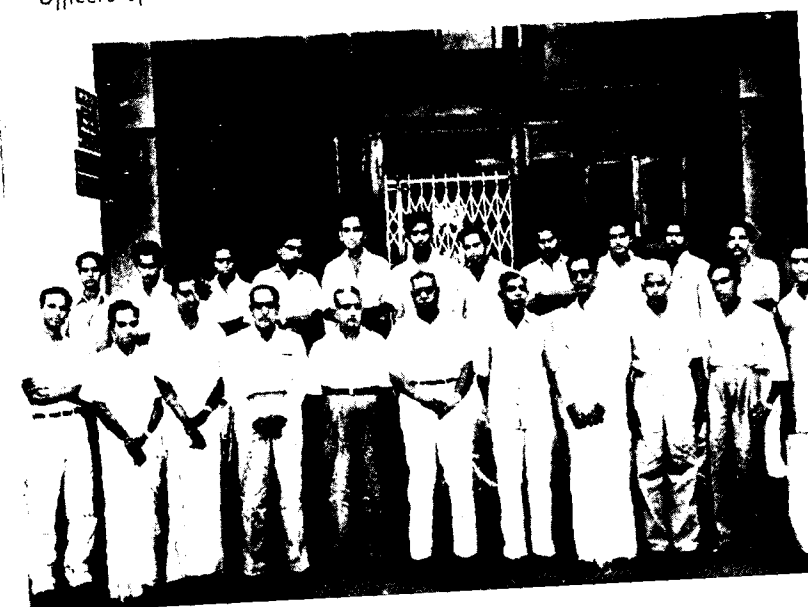
Returning to Trichy we visited the Golden Rock Railway Workshop, the biggest of its kind in the country. It took a good three hours for us to go round the various sections, but even then we can't really say we have seen everything.

Our Publicity Officer, R. Parthasarathy, was host to us at a luncheon party that day. A drowsy numbness overtook us after the meal that we cancelled many of the items we had earmarked for the afternoon. All that we practically did was to have a group photo with friends in the South Madras Electric Supply Corporation Ltd., a sister company.

Back to Madura by the night train. Another visit to the temple and the Tirumalai Naik Palace, famed for its architectural excellence. We also went to Tiruparankundram, a famous place of worship.

Back to Kundara on Tuesday morning and the "grind".
— "KANNAN"

The members of the excursion party took a "group" with the Officers of the South Madras Electric Supply Corporation Limited.





Republic Day Procession

Republic Day

"REPUBLIC DAY" WAS CELEBRATED ON January 26 with appropriate ceremony. A procession was taken out in the morning. The children were there in the van, rending the skies with patriotic slogans.

The rear was brought up by men who would not be outdone by mere children in the matter of shouting.

After the procession found its way to the flag-mast in the works area, it stopped... to watch with respectful attention the solemn ceremony of K. Kunju, oldest employee, unfurl the national tricolour to the strains of *Jana Gana Mana*.

Later, tiffin packets and "Horlicks" butted to the children.

Bright ideas continue to make money for ALINDERS!

A SUM OF RS. 215 WAS GIVEN away as suggestion awards on Club Day. The awards relate to suggestions made during the period from November 1956 to February 1957.

Total No. of suggestions received so far	...	208
Total No. accepted	...	79
Award amount paid	Rs.	1,640

Briefly, the details are :

1. **R. Gopalakrishnan**, Operator, Rod Mill: (i) The original C.I. spouts now remaining idle in our stores can be used as a cheaper and more efficient substitute in place of the present spouts, by enlarging the opening and reducing the length. (Rs. 25). (ii) (a) Regular and systematic maintenance in rod mill instead of waiting for a total shutdown of the equipment; (b) maintaining a log book for recording major or special items of work; and (c) cleaning of inductors at least thrice in a shift. (Rs. 40).

2. **K. Thomas Kurien**, Charge-man, Machine Shop: (1) Boring cutters can be made in our own shop at lesser cost. (Rs. 25 plus a calculated award after a six months' trial.)

(2) Used lubricants can be filtered and reused. (Rs. 10) (**Oil Salesmen, beware!**)

3. **K. Govinda Pillai**, Driver, Shipping Section: (1) Introduction of the job card system for civil and factory personnel. (Rs. 10).

(2) Issue of duty slips for drivers of Shipping Section to prevent possible misuse of vehicles. (Rs. 10).

4. **S. Gopalakrishnan Nair**, Cable Mill: (1) Modification of the basis adopted in calculating efficiency in Cable Mill; (2) Inspection Section to be asked to hand over numbered tags to wire drawing crews each time a spool is loaded; and (3) Running of a Co-operative Society. (Rs. 10).

5. **A. Shahudinkutty**, Cable Mill: For every 5 per cent over the minimum of 80 per cent fixed for calculating "efficiency," some award should be instituted. This will obviate a tendency to stop production at 80 per cent if the crew cannot achieve cent-per-cent which, at present, is the next minimum eligible for award. (Rs. 15).

6. **S. Narayanan Nair**, General Office: (Fourteen miscellaneous suggestions token award Rs. 15).

7. **V. Sebastian**, Office Peon: "Avail of the postal concession permissible for mailing *ALIND Abstracts*." (Rs. 15).

8. **P. R. C. Nair**, Stenographer: "Maintain a reference file." (Rs. 10).

9. **Joseph Zacharias**, Accounts Section: Suggestion regarding proper keeping of records. (Rs. 10).

10. **K. Padmanabha Pillai**, Stores: Cashew shell liquid to be stored in tanks (dismantled from wire drawing and kept idle) to be provided with taps to avoid spilling and wastage while drawing out. (Rs. 10).

(Awards made on 19th February 1957).



HIDDEN AWAY IN A VALLEY DEEP in the Peermedu range of the western ghats and surrounded by high mountain peaks, there stands a shrine in Kerala which attracts annually (in mid-January) several thousand pilgrims. It is the shrine of Ayyappan or Sastha, Kerala's special deity.

Sabarimalai, the spot where you have the temple, derives its name from Sabari, the saint hostess of Ramayana fame. According to

legend she had her hermitage somewhere here.

There are several routes leading to the shrine, but two are usually adopted. One lies through a 45-mile long, dense forest *via* Erumeli, and the other through a motorable road which branches off at Vandiperiyar, a plantation town. From here, it is 12 miles to Sabarimalai, but the last lap of the journey is the most arduous part. First there is an ascent

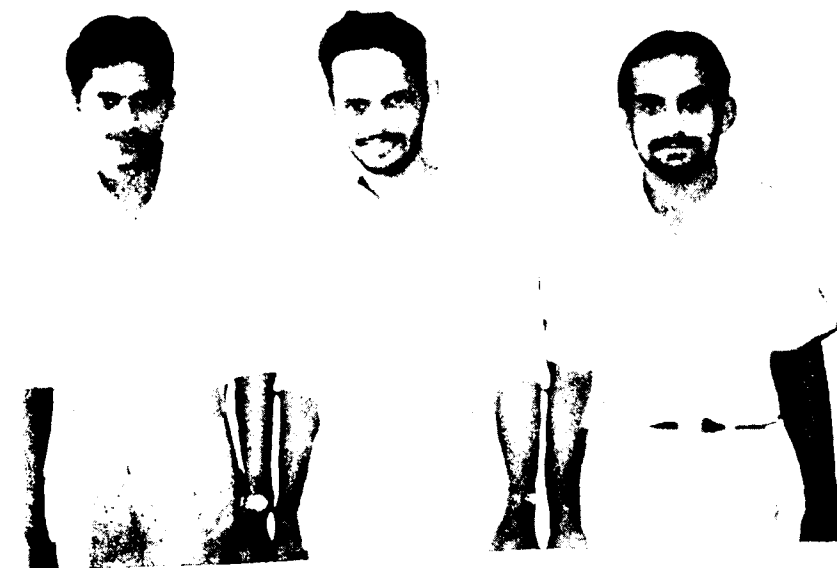
which simply takes your breath away, then there is a stretch of level ground, and finally there is a steep descent.

A number of ALINDERS joined the Sabarimalai pilgrims this year, braving the rigours of nature and the perils of the jungle.

May Lord Ayyappan's blessings be showered on those that went, and through those that went, on those that could not go! — K.R.O.

Above: Swami Abhedananda Bharati at bhajan in the Sastha temple

Below: K. R. Oorni Krishnan Nair, B. C. Kaimal and K. N. Gopinathan Nair who were among the party who trekked up to Sabarimalai



RURAL ELECTRIFICATION IN TRAVANCORE-COCHIN STATE

by A. O. OOMMEN, Superintending Engineer (Electricity)

THE ERSTWHILE STATE OF TRAVANCORE started rural electrification eleven years before India attained independence. Electric supply was commenced in the Travancore State on February 25, 1929 in Trivandrum City from a thermal station of 245-kVA installed capacity. This was followed up by thermal stations in Quilon, Kalamassery (near Alwaye), Nagercoil and Kottayam. The last two were installed by licensees.

Realising that the *per capita* consumption of electricity was an index of the standard of living and development of the people, the State Government launched an intensive drive for rural electrification as soon as electricity was made available from the first hydel station at Pallivasal in 1939. Out of the total of 4,088 villages with a population below 10,000 in Travancore-Cochin State (according to the 1951 census), 863 villages, or 21 per cent have been electrified (up to 1956). For this purpose, 1,850 miles of 11 kV lines and 2,626 miles of low tension lines have been constructed. By 1961, the end of the Second Five-Year Plan period the programme is to reach a target of 1,898 villages, or 46 per cent of the total number of villages in Travancore-Cochin State. Corresponding figures for the Indian Union are given in the table shown alongside.

Ahead of other States

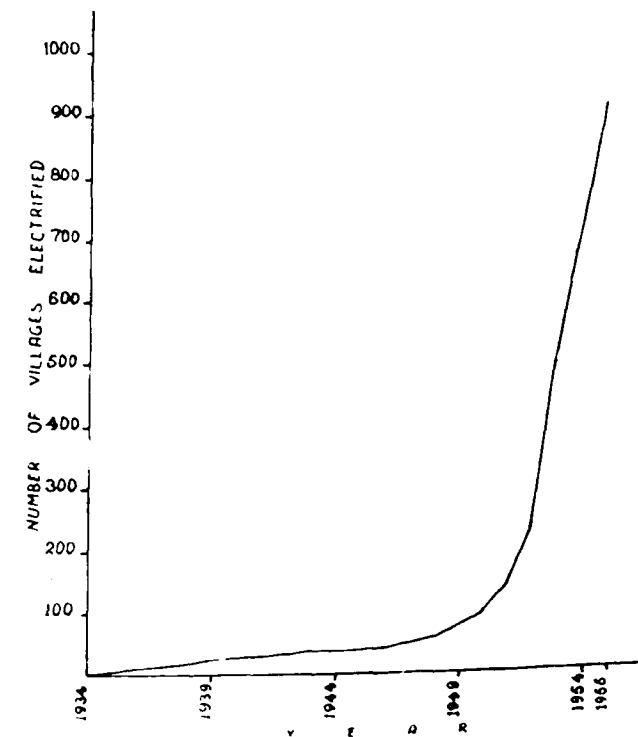
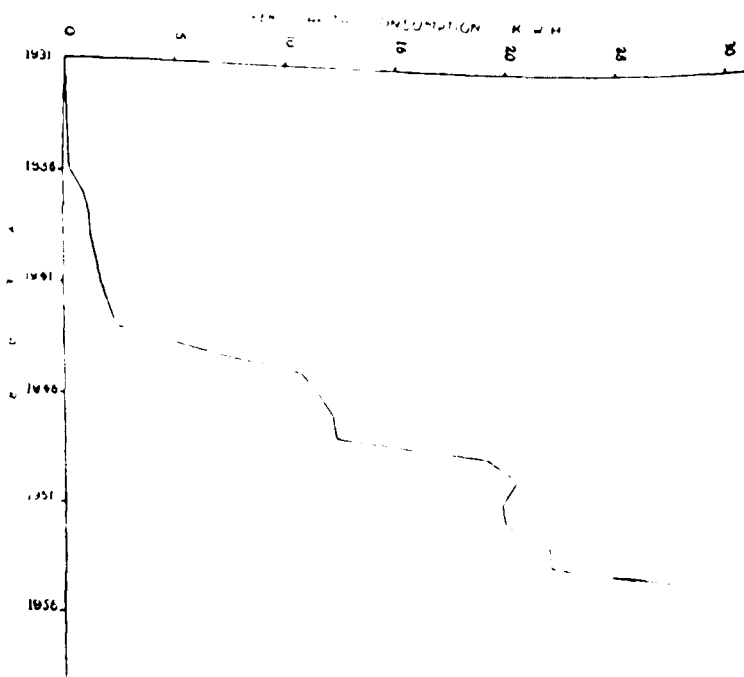
This will show that Travancore-Cochin is ahead of the other States in the matter of rural electrification. We are progressing fairly satisfactorily in the matter of bringing electricity to the door-step of the villager from the hydel stations situated in the ghats. Distribution work is,

	Villages according to 1951 Census with population up to 10,000	Number electrified by March 1956	Percentage electrified by 1956	Number proposed to be electrified by March 1961	Percentage proposed to be electrified by 1961
Indian Union	5,59,666	5,500	0.98%	12,600	2.25%
Travancore Cochin	4,088	863	21%	1,898	46%

for the most part, done by the State itself and there are very few licensees.

With the Reorganisation of States, 1,089 villages have been transferred from Travancore-Cochin to Madras State. In this area 207 villages or 19 per cent had already been electrified. A total of 1,613 villages in the Malabar area have been transferred

from Madras State to this State and out of these, 54 or 3.3 per cent are electrified. Taking the newly formed Kerala State, 710 out of 4,612 or 15.45 per cent villages have been electrified. It is anticipated that by the end of the Second Five-Year Plan, 1,509 villages in the new Kerala State, or 32.7 per cent will be electrified.



To begin with, the State Electricity Department was taking up the electrification of all villages, where the revenue return was estimated to be 12½ per cent of the capital investment in the case of 11 kV lines and equipments and 20 per cent in the case of L.T. line extensions. During the last 25 years, this standard of minimum return on the capital investment was being gradually lowered to encourage rural electrification. Now the minimum return insisted on is only 5 per cent of the capital cost. This has considerably increased the demand for rural electrification.

Another step in this direction was the abolition of the system of realising the cost of the service line, over and above the usual free length from the departmental mains. Now, only a minimum charge is realised, at the rate of 1 anna for every 10 ft. of excess, for single-phase lines, and 2 annas for 3-phase lines. This system has considerably eased the burden on the new consumer, who lives at a distance from the departmental mains, which is generally the case in rural areas.

The villagers are progressively utilising this new amenity electricity.

The *per capita* consumption of electricity is at present 30 kWh per annum and this is steadily rising. A large number of villages are fast developing into small towns with improved amenities and the migration of the population to the towns and cities in search of these amenities is getting less and less. The tariffs have been made uniform throughout both urban and rural areas. Besides this, the necessary equipments are being issued by the department to deserving consumers on hire and hire purchase systems on convenient terms.

Apart from power supply for lighting and other domestic purposes, power is being utilised for several small rural industries such as sugarcane crushing, oil mills, rice milling, flour grinding, coffee grinding, wooden toy and accessory manufacture, saw mills, etc.

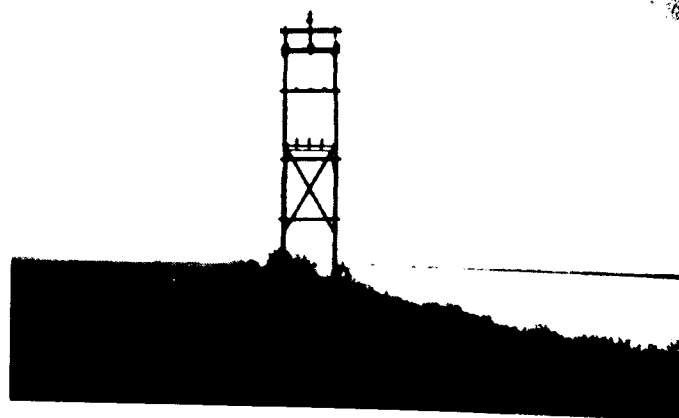
Power is also being used for lift irrigation and this has encouraged considerably the Grow More Food Campaign. In large blocks, lift irrigation is undertaken by the State, a water cess being levied. In case of isolated small fields, the cultivators themselves undertake the lift irrigation. They generally procure the

pump sets either on hire or on the hire purchase system from the State Electricity Department.

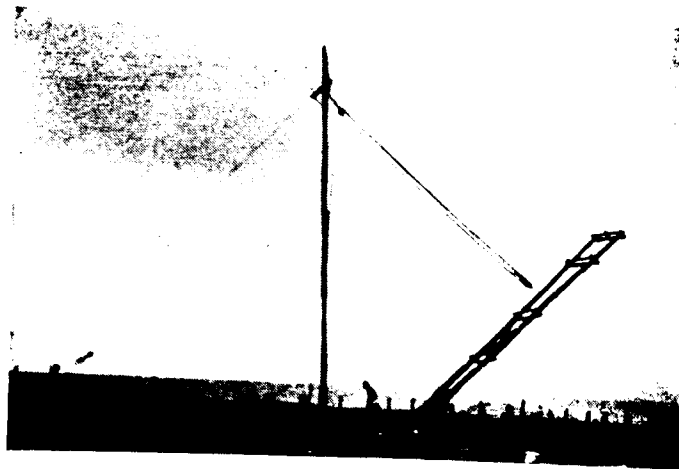
Dewatering

A unique use of electricity in this State is in dewatering the vast rice fields in the Vembanad lake and Kole areas, where reclamation has been carried out. The Vembanad lake is about 5 to 8 ft. deep and to cultivate rice here, bunds had to be constructed and the water pumped out. The soil in the lake area consists of about 2 ft. of fairly hard clay over soft clay. The bunds are constructed with the hard clay and sand thrown in layers into an enclosure made of split bamboo strips, tied to coconut piles driven into the clay on both sides of the proposed bund. The top of the bund is made up of twigs, sand and clay in alternate layers. These bunds have been standing up against floods and tidal action fairly satisfactorily. Pump sets are installed on these bunds in suitable places and the water pumped out. Locally made propeller type pumps are generally being used and these pumps were being run by diesel or gas engines of about 60 h.p. But almost all these have now been converted to electric drive, thus preventing the drain of money abroad for purchasing fuel oil. One 50 h.p. pump set is required for about 200 acres to complete the dewatering in time and the consumption is about 100 to 140 units per acre. At the tariff of 0.75 anna per unit, the cost of dewatering by electricity is only about 60 to 70 per cent of that using diesel oil. Besides, the dewatering is completed more promptly because of fewer breakdowns. The total connected load for this dewatering is 12,890 kW at present. There are 302 miles of 11 kV lines, 88 miles of L.T. lines and 430 transformers aggregating to 17,250 kVA. The area benefited is 55,500 acres including surrounding shallow fields.

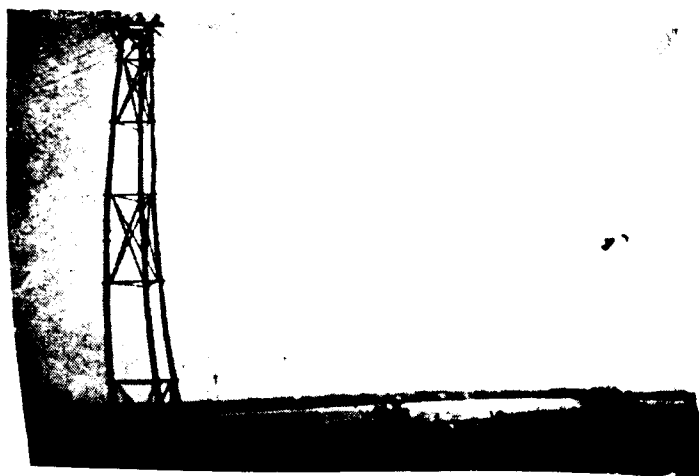
There were several problems in the electrification of these areas. Owing to the soft nature of the clay below the top crust, a wooden frame work is provided at the foot of the teakwood post as a shoe to increase the bearing area and the post erected without disturbing the top crust. Rubble masonry is constructed round the post and sand and clay filled in, in alternate layers. This



A typical 11 kV line in the lake area



Double pole under erection in the lake area



A triangular wooden pylon used for canal crossing

has proved to be satisfactory. In some places, due to uneven settlement, the poles have come off the vertical but they are not getting worse. The lake area is subject to heavy winds and consequently the span in the 11kV line has been limited to 300 ft. and 35 ft. poles have been used. For Canal crossings (between blocks of fields) where the spans are above 450 ft., locally made triangular wooden pylons are used.

"Ascu" treated teakwood poles are mostly being used as supports for 11 kV and L.T. lines in this State. Transformers up to 100 kVA are mounted on these poles for distribution purposes. Aluminium conductors are mostly being used and these conductors are to a large extent supplied by the Aluminium Industries Limited, Kundara. This village of Kundara is an example of the change brought about by electrification. What was a village 20 years ago has been transformed now into a township with the Ceramic Factory, Aluminium Industries, Allied Electric Industries, a potassium chlorate factory, starch factories and cashew-nut factories providing employment to a large number of people and additional amenities to the people.

A load survey of the entire State was carried out last year by the Electricity Department and on this basis further extensions of rural electrification are being planned. With hydel resources available in the State and the expansion of rural electrification throughout, this State has a great future, especially as the standard of literacy is very high and the people are intelligent.

Courtesy: Secretary of the Institution of Engineers, Trivandrum (1950)



Pictures 1, 2, 3, and 4 show some of the guests at the party. Picture 5: shows Mr. B. V. D. Menon, Director, thanking the guests for their presence. Picture 6: Prof. M. S. Thacker being greeted by V. G. G. Nayar, General Manager, Aluminium Industries Limited.

Party to Engineers

MESSRS. SESHASAYEE BROS. (TRAV.) PRIVATE LIMITED, Managing Agents, The Aluminium Industries Limited, gave a party to the Engineers who attended the 37th annual session of the Institution of Engineers, held at Trivandrum in January.

Pictures on this page show the Engineers at our works

In the picture immediately below can be seen (seated) Prof. M. V. Deshpande and Mr. J. Kurien, Chief Engineer, Electrical, Bihar and V.G.G. Standing behind Mr. Kurien is Mr. O. P. Bhasin, Superintending Engineer, Bareilly, Uttar Pradesh Electricity Department



Engineers visit ALIND

Many of the Engineers who attended the institution of Engineers Annual Conference held in Trivandrum in January paid us the honour of a visit on Feb. 3. They were most welcome, indeed, and we do hope that they enjoyed our "company" as much we did theirs.



Between 1949 and 1952, the Travancore Government took over a number of private firms carrying on business in mineral sands. All these companies later came to be known compositely under the name and style of Travancore Mineral Concerns Limited.

Effective from May 1 a new company called the Travancore Minerals Private Limited, partly owned by the centre and partly owned by the state, will be formed merging in itself TMC.

Our Neighbours

TRAVANCORE MINERAL CONCERNS

FROM COIR-MAKING TO MONAZITE is a pretty long swing, but then the story of Kerala's mineral sands industry is a little romance in itself. Incredible as it may sound, they do make "ropes of sand"—at least they did in the old days—out here on the West Coast, and thereby hangs our tale.

MONAZITE IN THE WAREHOUSE

In order to get a firmer hold while twisting and also to add to the weight of the finished product, the coir makers of Kerala mixed their fibre with the heavy sands of the beach. Even formerly, coir had a fairly extensive export market, and the presence of monazite in his warehouse, made a German Doctor Schomberg, sit up and take notice. He came to Travancore in 1909, he saw, and as things have shaped themselves out, to-day, we have conquered!

Before the advent of Edison's incandescent electric bulbs, the only source of bright light was the mantle lamp or "Petromax", as it was called, which is even to-day the only source in regions where electricity has not been able to reach through. The mantle gets its brightness from an impregnated mixture of thorium and cerium salts which, on ashing, eventually yields a mixture of the oxides of these two salts in the proportion of 99 : 1.

The discovery of monazite in Travancore coincided with a peak demand for thorium and cerium, present in monazite. And as Travancore monazite was richer in these elements than that obtained from other sources, like Brazil and the United States of America, Germany obtained practically a stranglehold on the mantle industry.

And then the electric filament lamp arrived and with it a slump in the monazite market. For sometime, it looked as though the monazite industry would fade out, but it did not. The concentrates of monazite which were exported first were only 70 to 80 per cent pure, whereas present methods of production have resulted in a mineral of nearly 99 per cent purity. If only such pure concentrates had been produced and exported in the very beginning, probably the discovery of a series of several other valuable minerals such as ilmenite, zircon, rutile and sillimanite might have been delayed.

ILMENITE

The black mineral ilmenite found with monazite is used in the manufacture of titanium pigments. A trial consignment of ilmenite was shipped first in 1922. The incidence of ilmenite being 30 to 40 times that of monazite, more attention came to be paid to the production of ilmenite. Exports of this mineral

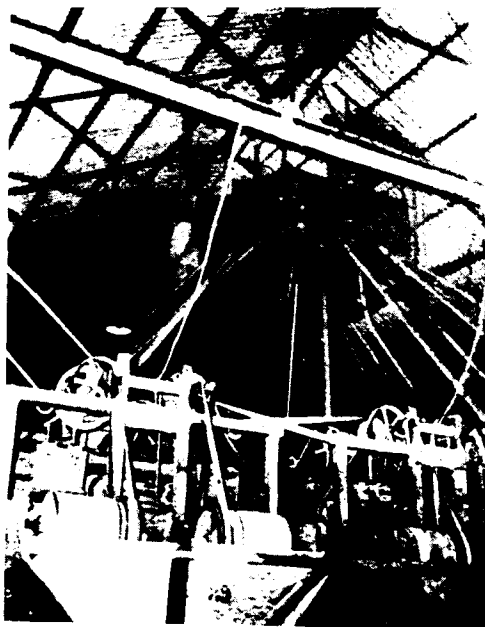
increased phenomenally over the years—by 1933 export exceeded a shipment of 50,000 tons, and in another ten years it touched 2,50,000 tons. There are now four plants operating in the Chavara area, accounting for an annual production of about 3 lakh tons. The deposits hereabouts contain anything from 60 to 75 per cent ilmenite.

PROCESS AND SHIPPING

The process of concentrating the ilmenite commences with the screening of the raw material in a vibrating screen to remove the lime-shells, coarse quartz, and other trash. The screened material is then conveyed by means of mechanical conveyors to electro-magnetic separators in which the ilmenite is concentrated as a magnetic product of 98 per cent purity. The ilmenite thus concentrated is carried in trucks to stockpiles for shipment. For shipping purposes, the ilmenite is packed in special jute hessian bags of one hundred weight capacity each, and the mouths of the bags are securely tied. Country craft dug-outs of one ton capacity are used for crossing the surf and transporting the ilmenite to sailing vessels known as "Tuticorin dhoneyes" of 150/200 ton-capacities, anchored about half-a-mile away from the breakers. The "dhoneyes" then get going and deliver the goods to the ocean-going vessels, anchored about two



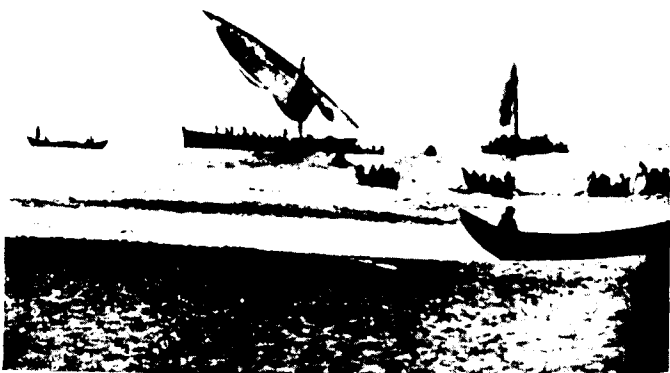
Mr. N. Raghavan Pillai,
Gl. Manager, TMC.



Above:
A view of the main ilmenite plant with the magnetic separators and overhead bin

Below:
Another view of the same plant

Right:
(1) Row sand trucks on their way to the plant. (2) Ilmenite off-shore loading in progress. (3) A stock pile of ilmenite ready for export. (4) Lighters start sailing with ilmenite cargo to the steamers which can be seen far away in the horizon



miles from the shore. The bags are hoisted aboard by means of the ships' derricks in specially-made slings of stout rope. The ilmenite is emptied into the holds of the ships and the bags returned to the shore for further fillings. Full cargo loads up to 10,000 tons are shipped in this way and part cargoes of 1,000 tons or more can also be arranged. Smaller tonnages of ilmenite are shipped in bags in which case the mouths of the bags are securely stitched. The ports of Kozhithottam and Colachel being open roadsteads shipping is possible only during the non-monsoon months from November and May.

TITANIUM

Until some years ago, titanium was classed among the rare elements, the chemistry and metallurgy of this metal being obscure. But it is now known to occur more abundantly in the earth's crust than several other common elements like nickel, copper, zinc and lead. The industrial application of ilmenite for the manufacture of titanium pigments marked the beginning of a study of this elusive elements and its compounds. Titanium pigments have a pleasing white colour which is particularly bright and permanent, and also remain unaffected by atmospheric sulphidation which blackens lead white. Titanium also goes into the composition of a variety of white and light-coloured objects such as paper, plastics, rubber, cosmetics, dental creams, floor coverings and ceramics. From about a 100 tons in 1922, the production of titanium pigments rose to 20,000 tons in 1932 and in 1945 it exceeded 200,000 tons. The current annual production is of the order of half a million tons.

Light, tough and anti-corrosive to sea water and many strong chemicals, titanium has certain unique properties. Because it is non-corrosive, the metal is used in the nacelles of submarines; because it is light, tough and has a high melting point, it is used in the building of planes, particularly jet aircraft. Whereas at supersonic speeds other metals soften on friction with air, titanium is unaffected. As it also resists the action of many chemicals and gases, it is used in the vital parts of chemical manufacturing plant.

Titanium is very expensive now for the simple reason smelting it pure is a very difficult task. Owing to its great avidity for oxygen and nitrogen, traces of which make the metal brittle and unworkable, titanium has to be smelted either *in vacuo* or in an atmosphere of inert gases like argon or helium. This makes costs prohibitive for common use. Titanium now occupies the place that aluminium occupied some 75 years ago prior to the adoption of the Bayer Process which brought down its production costs.

Three other minerals which have potential possibilities also occur on the beach sands. These are zircon, a silicate of zirconium also containing hafnium, rutile, an oxide of titanium, and sillimanite, a silicate of aluminium. Production and export of these minerals have so far been only on a small scale.

FROM THE GAS MANTLE TO THE ATOMIC REACTOR

Monazite of gas-mantle fame has made a dramatic return in recent times as a metal of first-class strategic importance. Thorium on bombardment with neutrons yields fissionable U^{233} and hence is an important source of atomic energy. Perhaps at a not too distant date thorium may be used as the principal fuel in atomic reactors replacing the better-known uranium, because thorium is more plentiful than uranium and the reaction is less violent than that of uranium.



Mr. P. Viswanathan,
Chief Chemist

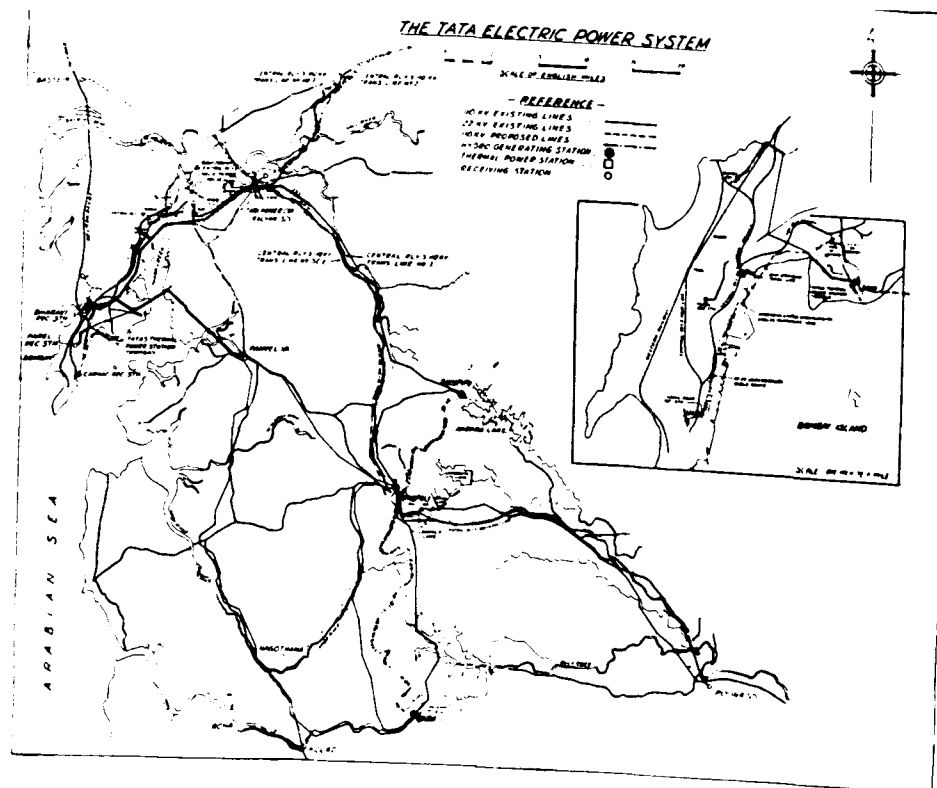
The cerium group of elements contained in the monazite are also finding extensive uses. A series of ferro-cerium alloys known as pyrophoric alloys, are used in tracer shells, cigarette-lighter flints and pyrotechny. Cerium is also used as a scavenger of furnace gases in the smelting of copper-steel, etc. The other rare earths—known as lanthanons—of the lanthanum group are used in the manufacture of optical glasses for unbelievably accurate aerial camera lenses.

Such is the potentiality of these mineral sands that it is difficult to exaggerate their national importance.

Obituary

IN THE DEATH OF MR. G. SUNDARAM, FORMERLY CHIEF ENGINEER, Madras Electricity Department, which occurred about two months ago, our Company has lost a valued friend and well-wisher. He was among the first few to pay a visit to our plant after it got going. An eminent Electrical Engineer brought up in the Sir Henry Howard tradition, his guidance was eagerly sought after both by his colleagues and friends even outside the department.

To the members of his bereaved family, ALIND CHRONICLE would like to tender its respectful sympathy.



Origins

The region of the Western Ghats, about 50 miles to the south-east of Bombay, experiences some of the heaviest rainfall in India. Rainfall ranging from 100 to 400 inches is precipitated in this area during the three-and-a-half months of the monsoon. For centuries, this great volume of rain-water flowed eastwards, as its western course was barred by the natural barrier of the Ghats. Towards the end of the last century, Mr. David Gostling, a leading architect of Bombay, conceived the idea of utilising the abrupt drop on the western side of the Ghats for generating hydro-electric power, if a scheme could be devised for storing, in the natural contours of the Ghats, a portion of the water which hitherto had flowed towards the eastern plateau. Jamshedji Tata saw the great potentialities of such a scheme and studied it further with characteristic thoroughness. He visualised Bombay as a smokeless city with electric traction and a plentiful supply of cheap electric power for domestic and industrial use. The plans laid by Mr. Tata towards the turn of the century came to fruition, after his death in 1904, with the establishment of the three Tata hydro-electric companies, namely, the Tata Hydro-Electric Power Supply Co. Ltd. (registered 1910), the Andhra Valley Power Supply Co. Ltd. (registered 1916) and the Tata Power Co. Ltd. (registered 1919).

Hydro Power

The three Companies, which are separate corporate entities, function for all practical purposes as a grid and their operation is co-ordinated by a common agency, the Tata Hydro-Electric Agencies Ltd., the managing agents of the Companies. Common administration and technical supervision as well as the pooling of plant and water storage capacities result in reliability and operational economies. The Tata Hydro-Electric Power System serves an area of about 1,000 square miles in the Bombay-Poona region with an estimated population of over three million. In terms of energy production, it is the largest power system in South-East Asia with a generating capacity of 274,000 kW.

Hydro-Cum-Thermal Power

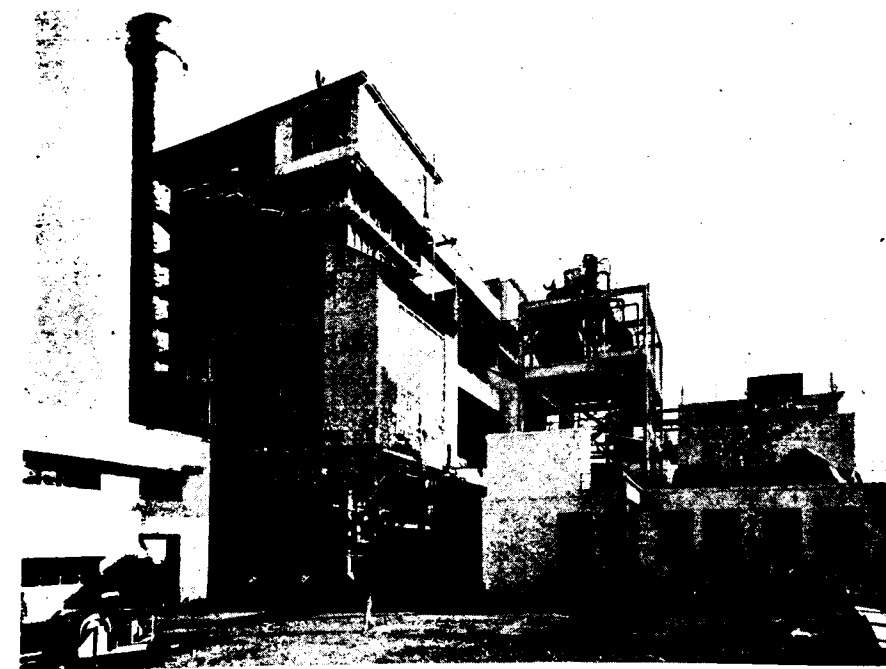
In the year 1929 the Central Railway (then known as the G.I.P. Railway) put up its own thermal electric station at Chola near Kalyan for supplying the needs of its electric traction. Under a reciprocal arrangement with the Hydro Companies, the Chola station was interconnected with the Hydro-system in 1940. The present capacity of the Central Railway's plant at Chola is 64,000 kW. In recent years, the Government of Bombay has installed 54,000 kW of additional thermal capacity at Chola, which has also been connected to the Tata-Railway grid, thus bringing the total capacity of the inter-connected system to 392,000 kW.

Although the hydro capacity of the Companies was augmented during 1951-52 by the installation of a 22,000 kW unit at Bhira, it was soon found that the Tata-Railway-Government system capacity would be inadequate to continue in future years to meet the fast-growing demands of the industrial and other consumers in the Bombay-Poona area. In order to meet this ever-increasing demand for power in an era of rapid industrialisation, Tatas have now come out with Trombay.

Trombay Thermal Power Station

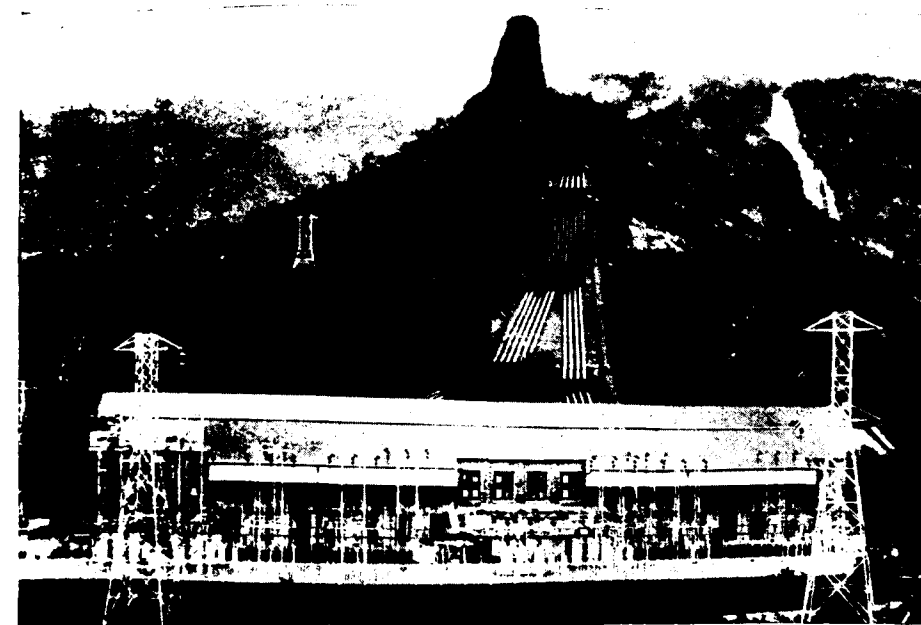
'Come out,' indeed! Trombay has been three years in the making, in the language of Hollywood.

Trombay is a thermal station, consisting of two turbine generator units of 50,000, 62,500 kW each, fed with steam from two boilers, each having a capacity of 600,000 lbs. per hour of steam at a pressure of 1335 lbs. per square inch and a temperature of 955° F. The plant is of the semi-outdoor type, designed on the unit system with one boiler and one turbine per unit with central and automatic control for two units. The boilers are of outdoor construction and are designed to burn gas, oil and pulverised coal. Sea water is used for condenser circulation. A 50-ton outdoor gantry crane straddles the turbine generators for lifting the heavy equipment.



Trombay Thermal Power Station: It consists of two turbine generator units of 50,000 and 62,500 kW each

Bhira Power Station: This is a 22,000 kW unit



Our Friend

The Tata Electric System

THE CUSTOMER WE PROPOSE considering in this issue is THE TATA ELECTRIC POWER SYSTEM. Proudly we present their story... as the salute of one unit of enlightened free enterprise to another unit of enlightened free enterprise.

This apart, a special reason for telling the Tata tale in this number is that the Trombay Power Station was formally commissioned in January. The first set is now in commercial operation generating 50,000 kW. More about this later.

The Tata Electric Power System serves the highly industrialized Bombay-Poona region in Western India. It is the principal power system in India and is interconnected with the Central Railway Thermal Power Station at Chola, near Kalyan. Since March 1954, the Bombay State Government has established its own thermal station in the premises of the Central Railway Chola Station, which is operated by the Railway authorities. The entire output from the Chola Station is delivered to the Tata Power System.



Mr. N. N. Jengor,
Director, Tata Electric System

Below :
Mr. S. M. Zubair,
Chief Engineer

The units are controlled by a centralised boiler-turbine-generator control board. The feed water and combustion are automatically regulated.

The Trombay thermal station, being located near the load centre, will greatly facilitate the regulation of the power system. It will have a high thermal efficiency of about 29 per cent and will operate at a high load factor to diminish the incremental cost of energy.

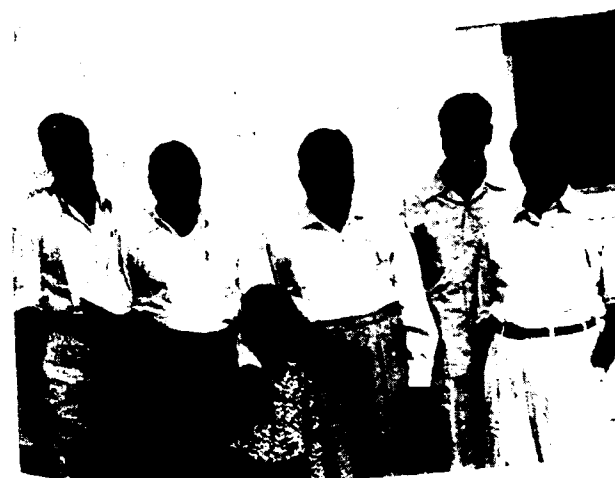
Around the turn of the century, when Bombay was very much a town of candlelight and the bullock

cart, Jamshedji Tata drew up his plans to achieve the twin miracle of light and power electricity for the city. It is a melancholy thought that the great man did not live to see his dream come true, but come true it did after him thanks to the continuing vision of his successors, their skill and enterprise.

(The Editor wishes to acknowledge his gratitude to Mr. R. Srinivasan of the Tata Hydro-Electric System for showing him around, rather up, Trombay and for other help given; also to Mr. Faruk Mulla, Public Relations Officer, for notes, pictures and photographs supplied.)



WELCOME VISITORS



L. Top : Mr. D. R. Vedamuthu, Gnl. Mgr., Travancore Bank, Mr. Charles G. Gorton, V. G. G. Nayar, Mr. Edward De Jong of Bank America, San Francisco, Mr. M. R. Ahuja, Representative, Bank of America, New Delhi, Mr. S. K. Nair, Mgr., Trav. Bank Ltd., Quilon

L. Centre : K. R. Sankaranarayan, Mr. R. Sambasivan, Dist. Engineer, W.C.E.S.C., Kozhikode, Kannan, son of V. G. G., Mr. P. V. A. Narayanamurthi, Dy. Chief Elec. Engineer, DVC., Master Narayanamurthi, Mr. C. R. Ramanathan, Resident Engineer, W.C.E.S.C., Cannanore

L. Bottom : Mr. J. Sharma, Jaipur, Dr. N. J. Neuschmid of Osterreichische Metallwerke A. G. Ranshofen, Austria & V. G. G.

R. Top : Mr. T. N. Puri of Burmah-Shell and Mrs. Puri

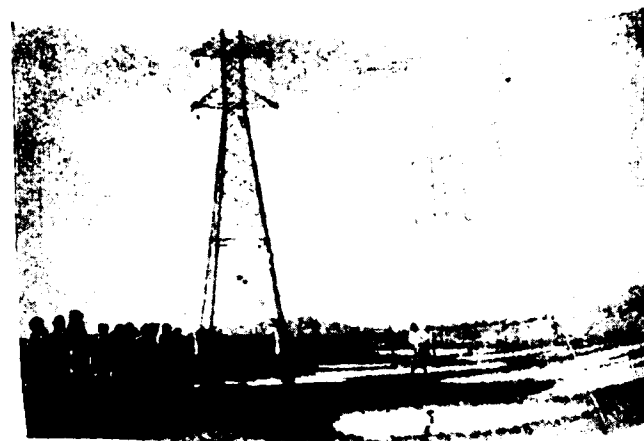
R. Centre : Mr. P. P. Adalja, Mrs. Adalja, Mrs. Rukmini K. Nair, Mrs. Vijaya G. Nayar

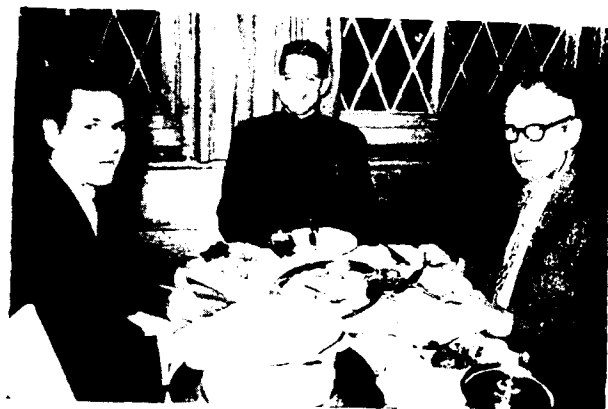
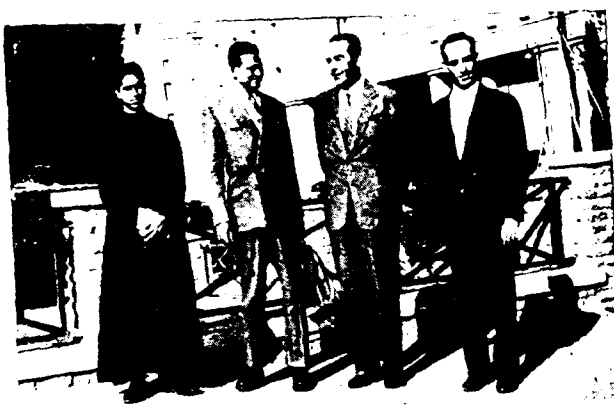
A group of the engineers who visited ALIND on Feb. 3

Paying out across the Bombay creek



ALIND transmission line across the creek





Round the aluminium world in forty days !

by V. G. G. Nayar

IT WAS PRIMARILY A GOOD WILL TOUR.

In the last few years ALIND had secured in Europe and America a host of friends. I thought I would reinforce this bond with personal contact. Other objectives were : (a) technical developments in the various countries in applications of aluminium in the electrical conductor field could be studied ; (b) new sources for supplies of required quantities of our raw materials and equipment could also be established.

I saw Rome . . . and the Pope ; he looked a kindly, affable sort of person ; beautiful Switzerland was most interesting with its cuckoo-clock-like meticulousness ; West Germany was active, serious and

Left :

(1) With V. G. G. Nayar (second) are Mr. Ilario Properzi (third) and Mr. Claus Reich. Rev. Father Philip (first) is from Kundara and is now in Rome

In pictures 2, 3 and 4, besides Nayar others are :

(2) Mr. Kern of Aluminium Commerciale and Mr. E. Schmid of Volkart Bros., Zurich

(3) Mr. Charles G. Gorton and Mr. Hans Schwaborn (standing) of Messrs. Muller & Schwaborn of Koln-Mulheim and Mrs. Schwaborn (sitting)

(4) Mrs. Russ Electroofen (centre)

Below :

Mr. Hockstrauss, Manager, Mr. Muller, V.G.G. & Mrs. Muller



hospitable. The United Kingdom was slowly emerging out of its war-time austerities, and after many years appeared normal. With her population of 15 million and an area of three million-odd square miles, Canada barely touched a fraction of her resources, but she is probably already having the highest *per capita* production of wealth for any single country. In spite of this, there is a disarming modesty about the Canadian citizen which is hard to find anywhere else.

And above all, I had the privilege of seeing once again the great American people during their historic election campaign. I was once again convinced that here was a nation simple in its aspirations, traditional in its virtues and conscious of its high destiny. Here were

Right : Besides V. G. G. others in this set of pictures are :

(1) (Front row) Mr. C. E. A. Bramley, Mr. Charles G. Gorton (third) and Mr. Wilmot Smith (Back row) Mr. D. Carter and Mr. A. C. Green of AWCO, Swansea

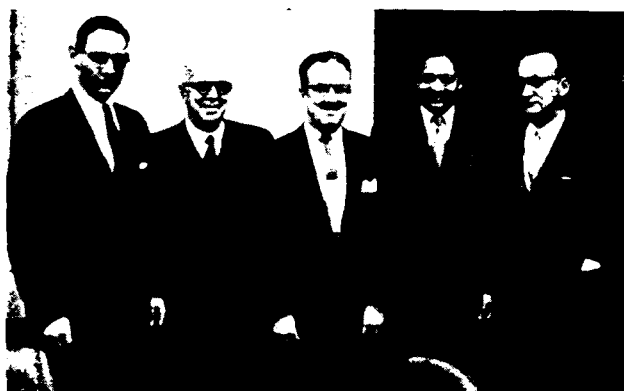
(2) Mr. Manuel Tama, Vice-President, Ajax Engg. Corporation, Trenton, U.S.A.

(3) Mr. Roger E. Schoerner, Vice-President and General Manager of South Wire Company

(4) Mr. W. E. Chambers, Manager, GI Industries and Utilities Dept. and Mr. Falinsky of Patents Division, Westinghouse Electric International Co.

Below : Mr. David B. Miller, Vice-President, ALCOA and Mr. John W. Wilson, Manager, Export Division





170 million people, capitalistic, if you measure the quantum of their personal wealth, but socialistic if you reckon their uniformly high standard of living. The more the contacts I made, the more I realised how dynamic, humorous, impatient, impulsive and very generous Americans were as a nation.

In Rome, I met for the first time, Mr. Ilario Properzi, the grand old man responsible for the most original metallurgical idea of the century—namely, continuous casting and rolling. In Switzerland, I saw Mr. Huenerwadel, a doyen among electrical engineers and one who had developed the uses of aluminium in *electro-technics* and Dr. Haenni, the versatile director of the executive training centre for the boys from the Aluminium Limited Group.

In the United Kingdom, the directors and senior executives of Aluminium Wire and Cable Company, Aluminium Laboratories Limited and Aluminium Union Limited readily and willingly showed and

Left :

With V.G.G. (fourth) and Mr. Percy E. Radley, Project Manager, Kitimat Development are executives of ALCAN at Kitimat

Mr. Philcross, Sales Manager, Mr. Albert Bards, Treasurer, Mr. T. F. Paterson, President, Mr. Ernie Johnson, Manager, (last) Preformed Line Products, Cleveland

Mr. Alexander Winn of ALCAN

Mr. J. W. Bells, Works Manager, ALCAN Foundries, Ewbicoke, Toronto

Below :

Mr. A. A. Defoe of Aluminium Laboratories Ltd., and V.G.G.



explained to me the latest technical developments in their units and in their country as a whole.

Our machinery suppliers in Germany were both charmingly hospitable and businesslike at the same time. They were co-operative too in discussing improvements in the design of their equipment and in meeting our requirements in every respect. The cable works of Messrs. Felton & Guillaume which I visited struck me as a most impressive show.

In the U.S.A. Mr. Frank Nichols who visited us at Kundara in 1955 and who is certainly one of the best friends of ALIND was my chief host—he very kindly worked out the details of my tour in his wonderful country. It was possible to meet all the main personalities of the aluminium business in the U.S. at an Aluminium Association function. Among them were "Chief" Wilson, President, Aluminium Company of America, Mr. David Reynolds, Vice-President of Reynolds Metals Company and Mr. Rhodes, Vice-President of Kaiser Aluminium Co., and

Right :

(1) Mr. Felix French of Aluminium Union Limited, Montreal

(2) V.G.G., Mr. H. M. Barbour, Plant Supdt., Reynolds Cable Mill, Alabama and Edmund Z. Lampe, Market Manager, International Divn. of the same company

(3) Mr. Termuende, President, Richmond Electric Co., Vancouver, Canada

(4) Mr. N. Nath, Managing Director, Electrical Machines Corporation, Calcutta and V.G.G.

Below :

Mr. W. E. Linne, Plant Supdt., Kaiser Aluminium, Newark, Ohio, greeting V.G.G.





Above :

Flanked on either side of VGG are Mr. A. R. Holland and P. H. Greer of Aberdare Electric Company, Dublin

Right (top) :

Mr. Stanley F. Rice of Aluminium Union Limited, London

Centre :

Mr. J. W. Sutton, Editor, Wire Industry and VGG



Mr. Robert R. Cope, Head, Electrical Section, ALCOA Research Laboratories, New Kensington

VGG and another member of the same organisation



Mr. E. J. Groom,
Editor, Light Metals

various senior executives from Anaconda, Reveres, Harveys, etc. President Wilson conveyed through me this message to the aluminium entrepreneurs in India :

" America is anxious to help you in every respect. But the initiative must come from within your great country. You have a long way to go, the *per capita* consumption is only 1/10 lb. against U.S.A.'s 22 lbs. We wish you all success."

During this tour I visited some of the biggest aluminium conductor plants in the world, including Kaiser Aluminium's Newark works and Reynolds' Listerhill works.

A pleasant interlude was a day with the South Wire Company in Carrolton, Georgia, a top-notch house of medium-size (like our own) and engaged in more or less similar activities, with our own zeal and expansive and progressive outlook.

At Pittsburgh was the formal convention of the American Wire Association where my paper on *Certain technical aspects of the Properzi casting and rolling equipment* was presented to a packed hall of interested wiremill proprietors and executives from the USA and practically all countries in the British Commonwealth and Western Europe. Mr. Frank Nichols was good enough to introduce me and ALIND to the audience in very kind and generous terms. My paper, as well as his own paper on the *Progress of the Properzi Process*, was certainly well received. The Wire Convention enabled informal discussions with competent and senior private and technical men on



Mr. Frank R. Nichols and members of his family

uses of aluminium in the electrical field all over the world.

No one who goes to Pittsburgh can escape the majesty and grandeur of the Aluminium Company of America's gigantic office building, the world's first and biggest aluminium sky-scraper. It is a thing of beauty well-engineered. It was also possible for me to include a visit to the great New Kensington research laboratories of Aluminium Company of America.

In Canada the main places of "pilgrimage" were Kemano and Kitimat. Kemano is very near the arctic circle, and the power house 1,600 ft. long x 100 ft. wide x 160 ft. high scooped out from under the mountains, is one of the world's marvels of engineering. The transmission line between Kemano and Kitimat in the mountainous terrain is breath-taking in the challenges it has posed to construction engineers.

I also visited the good old Shawinigan Falls, works of Aluminium Company of Canada where I had my training, back in 1947-48. Mr. Lomer Pellerin, the technician who helped us to commission our Kundara plant were all cordiality and cheer. Mr. Alexander Winn who was in charge of my training in Shawinigan Falls is now looking after all trainees in ALCAN, and was very happy to be met again. A day was spent at the Aluminium Laboratories Limited, Kensington where I met my old

friend Mr. Defoe, Chief Engineer of the Electrical Division.

Aluminium Union's vice-presidents and executives evinced great interest in extending to us technical and other co-operation and meeting our requirements of aluminium metal to the maximum possible extent. A big, new source of supply of metal opened out through the willingness of the great Aluminium Company of America organization to supply a portion of our increasing requirements.

A return from the bewildering prosperity and reassuring hospitality of the American Continent to an England feeling high and dry after the "Eden war" made one feel a bit tense and frustrated. But our friends in the aluminium business were as optimistic and cheerful as ever.

Mr. Charles G. Gorton, who is proud to be designated our "London Office," accompanied me in my travels in Europe and the U.K. We are glad he is spending some months with us here in Kundara.

All the people whom I met in all the countries wish us godspeed and full success and the least I could do in reciprocating their hospitality and kindness is to thank them most sincerely and tell them how much we in ALIND and in India appreciate their understanding of our problems and their determination to see us through the many hurdles confronting us in our great task.

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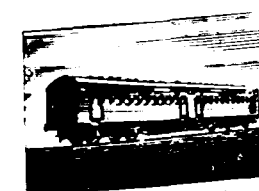


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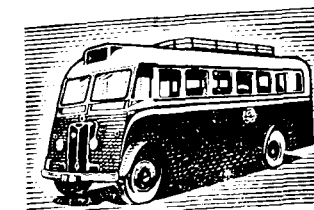


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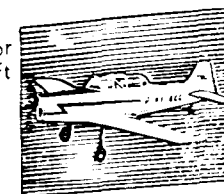


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