MOTOR INDIA

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MOTORINDIA

MOTORINDIA wishes readers, patrons and motorists A BRIGHT & PROSPEROUS 1962.

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ON THE COVER

A new British invention, "REDI-SPARE", repairs punctures and re-inflates a tyre speedily.

In use the connector is screwed onto the tyre valve, then the canister is screwed onto the free end of the connector. This automatically releases a special quick-sealing medium, together with pressurised air, into the tyre, sealing the leak and re-inflating the tyre.

"Redi-Spare" can be used on tubed or tubeless tyres, and will inflate a tyre up to a pressure of 32 pounds per square inch.

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editorial

DUNLOP'S SAHAGANJ KEEPS THEM ROLLING

The rapid development of road transport in India over the last decade has opened up several new avenues of progress. Today trucks, lorries and buses link most parts of the country, carrying goods and people to regions once remote. With the growth of road traffic, has grown the demand for tyres and other rubber goods for industrial purposes. The production of automobile tyres is expected to be doubled from 1.61 million to 3.7 million by the end of the Third Five Year Plan.

In this context, there has been nothing sensational about Dunlop's progress over the last twenty five years in India—except its signal SUCCESS. Dunlop is a name known throughout the world, being one of the oldest rubber companies and a leader in its field. In 1936, Dunlop was the first to start the manufacture of tyres for automobiles in India at its Sahaganj factory, and the Sahaganj programme, based on leadership and persuasion, has moved forward apace through the years.

In the short span of twenty five years, amazing innovations have been developed in this factory. While Sahaganj was the first to manufacture car tyres in India, it was oddly enough, the first factory to produce pneumatic tyres for the lowly bullock cart—the cheapest and most common mode of transport in rural India, where buses and lorries cannot ply. Thus Sahaganj set the trend for the modernisation of this important means of rural transport in our country. The full significance of this Dunlop innovation can best be appreciated when it is borne in mind that bullock carts today haul as much freight as our railways.

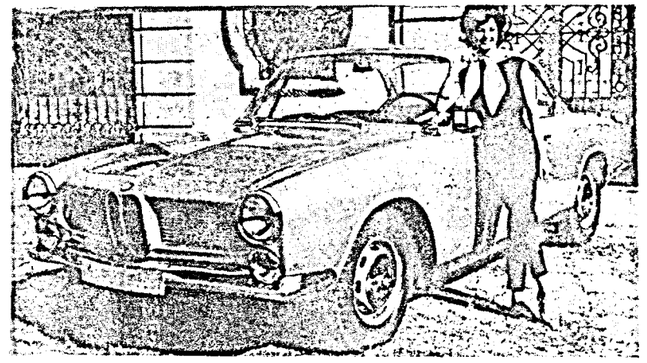
And Dunlop's Sahaganj is not content to rest on its laurels. Even in this its Silver Jubilee year, it has installed new machinery to add yet another product to its growing range — giant tyres for the inter-continental Boeing jet airliner. And so, Dunlop's Sahaganj grows from strength to strength, from service to greater service to the nation, providing higher living standards and purchasing power for our countrymen, and more products for our needs.

From Gordon Wilkins

THE TURIN MOTOR SHOW

Record Production & Exports

The Turin Motor Show opened In a cheerful atmosphere, with the italian motor industry breaking records for production and exports. From January to September 1961 they built 501,483 cars and 47,018 trucks, increases of 11 per cent and 48·8 per cent over the same period last year. Exports are booming; 171,963 cars, a rise of 9·9 per cent and 6,787 trucks, a rise of 63·7 per cent. The proportion of exports is rising alongside the rapid increase in home market sales. New car registrations in Italy are up over 25 per cent this year. There is now one car for every 21 people in Italy.



On display at the Turin Motor Show was this delectable B.M.W. 3200 CS, "coupe for four."

Station Wagons Fiat 1300 & 1500

As this was the fourth major international motor show in six weeks, there were few new models, but Fiat cater for the advancing popularity of the station wagon with a new four-door model for 1300 and 1500. It has a one-piece lift-up tail gate which is reduced in width at floor level to allow space for two big horizontal tail lamp clusters.

Fiat to Produce 3000 Vehicles A Day

Fiat, are one of the most self sufficient vehicle manufacturers in the world, producing almost everything from the steel and light alloys to the lubricating oil for their cars. Their present output is 2500 vehicles a day and it is expected to rise to 3,000 by March 1962.

Sales

The Fiat 6000 remains by far the most popular car in Italy with 100,607 home market sales in the period January—August 1961. Next comes Fiat 1100 with 43,652 sales, but the competition is increasing, especially from the Renault Dauphine built in Italy by Alfa Romeo and the Austin A-40 built by Innocenti. Here are the Italian prices.

Dauphine	795,000 lira
A-40	880,000 lira
Fiat-1180	890,000 lira

Fiat Domestic Sales

Fiat still holds 63 per cent of the Italian car market, but not so long ago they had about 90 per cent. Their determination to fight on all fronts is shown by the expansion of their range to over 20 models, from the little two-cylinder 500 to the luxurious 2300S coupe with body by Ghia which has disc front brakes, a four speed all synchromesh gearbox, does 123 m.p.h. and costs £ 1,540 in Italy. The Fiat 1100 Special has been given new doors and side panels and revised interior trim without the former ribs indicating that it is likely to stay in production for some time yet. The 500D and 600D have padded sun visors; the 500D gets screen washer and courtesy light, the 600D has glove shelf front ashtray and adjustable backrests.

Renault Dauphines, Ford Anglias & Austin A. 40s.

Alfa Romeo sold 15,662 Dauphines in the first 8 months of the year and Innocenti 9,954 A. 40s. Top seller among cars imported complete was the Ford Anglia with 4749 registrations against VW's 4549.

The Guilietta & Flavia

Alfa Romeo have made several changes to the Guilietta sedan, giving it the grille of Guilietta Sprint and wider lid for the trunk. Lancia have given the Flavia slightly more power, (110 bhp. net: against 102) and extensions to the shaft housings on the crankcase and the rear-mounted clutch have shortened the propeller shaft, which is now in one piece, with no central support. Adjustable air ducts have been added to the instrument panel.

Maserati 3500

Maserati are stepping up the output of their 3500, which like the 5,000 can now be had with Lucas fuel injection into the ports, giving

233 bhp at 5,500 r.p.m. from 3,485 c.c. (an increase of 15 b.h.p.)

New Body Designs

The Italian coachbuilders had a hall to themselves and their new designs provided the major interest of the exhibition. New bodies for the Fiat 1300/1500 were particularly numerous. The Italian coachbuilding industry is now highly organised for quantity production of top quality bodies and is already making bodies for several foreign factories. Pininfarina is doing the convertible body for the Peugeot 404. Bertone, who has just moved to a splendid new factory employing 800 workers, is sending coupe bodies to Germany for NSU and BMW. Vignale, who has been making the Italian coupe on the Triumph TR3 chassis for the Italian market is planning a TR4 coupe for export. And now Carrozzeria Touring, who are just completing a big new factory at Milan are going to assemble Sunbeam Alpines and possibly other Rootes models for Common Market countries. I expect other British manufacturers to be using Italian-built bodies before long. Already the top five, Pininfarina, Ghia-OSI, Bertone, Carrozzeria Touring and Vignale have a combined production capacity of about 225 bodies a day, fully trimmed and painted. And nowadays "body" often means the whole car, except for the mechanical parts.

The "Mills" Ferrari

One of the most discussed cars in the show was a delightful little coupe by Bertone bearing an enigmatic name plate with one word only: "Mills". It is said to be the design study for the new small Ferrari, which will have an engine of just under 1,000 c.c.; a high-performance baby which will certainly be the most expensive thing in the 1-litre class.

Lancia Flavia Coupe

Another designwhich was much admired was the new Lancia Flavia coupe by Pininfarina. While retaining practically the same grille and headlamps as on the standard model, he avoided the rather heavy frontal appearance of the standard sedan body, and the interior, with its almost flat floor, proclaims the advantages of front wheel drive.

Pininfarina's Lozenge Car

The curious lozenge car which Pininfarina showed last year was on view again. It has one wheel in the nose, two under the rear seats and one in the tail. But alongside it was a more conventional four-wheeler designed to take advantage of the same efficient streamlining. It should be able to cruise fast on a very low fuel consumption, but I don't think it will start a new fashion.

Conservative Fashions

With the exception of these two experimental projects, the Italian fashions are now fairly conservative. The aim now is to produce elegant but practical cars which will not date quickly. In this they are succeeding admirably. The most popular of all the Alfa Giulietta models apart from the TI sedan is the original Super Sprint coupe by Bertone, which was designed nine years ago. There is a lesson here for manufacturers who cannot leave well alone, but must go on making pointless changes year after year. Very few designs are ever improved by a "face lift" and the London Show displayed some awful warnings showing how easy it is to wreck a good design with a few ill-considered changes.

The Jaguars

Oddly enough, the Mark X Jaguar, which attracted so much attention at the London Show stood almost unnoticed in Turin, while the sport-loving Italians gathered round the E-type. But one of the best Italian designers told me he regarded the Mark X as the best looking production model in Turin. A feature of the interior trim on the new Italian cars is the widespread adoption of the newest soft and flexible plastic materials which are challenging leather on even the most expensive models. But gaudy effects, with multi-coloured cloths and metallic threads are rare. Colours are sober and instructments are legible.

New Look BMW 1500

Incidentally, an interesting change has come over the BMW 1500 in a few short weeks. At Frankfurt, its lines, evolved by Michelotti, were much admired,but there was some surprise at the gaudy interior treatment which seemed to draw its inspiration from the juke box and the piano accordion. All that has been swept away and the interior on the car shown in Turin has been re-done in impeccable taste.

NEW TYRE, 25 BETTER

A new tyre by B.F. Goodrich, said to be 25% longer running than its predecessors has been announced, Tyres, says Goodrich, usually wear on the outside tread area and are either scrapped or recapped when the outside tread disappears. Hence, Goodrich moved some of the rubber from this centre area to the outside tread area which accounts for their 25% longer running figure.

WHAT'S WRONG WITH BEING AN OIL COMPANY IN INDIA ?

Private enterprise in the Indian petroleum industry has so far kept up the flow of petrol and petroleum products into this country. The following article highlights the increasing importance of Oil products and Oil Companies in shaping our modern India.

Lopsided Logic

We are getting tired of hearing about those rich, foreign, oil distributing and refining companies in India. We are getting tired of hearing our Union Minister for Fuel, Mr. K. D. Malaviya, and Members of Parliament talk about the oil marketing companies growing tremendously wealthier out of marketing and refining oil in this country, and tired of newspaper columnists, who shudder piously each time they mention an oil company or an oil man. We are getting tired of the implication that for an oil marketing and refining company to exist and operate in India is a national affront, and that for such a company to be rich is sinful. Will someone tell us what is wrong with being an oil marketing and refining company or with an oil company's making a legitimate profit on its huge capital investment? How long do you think an oil company could last if it did not make a reasonable profit or if its operations resulted in sustained losses year after year? It requires quite a lot of money just to keep an oil company going.

Govt. cannot run Oil Industry

And who is going to find, produce, process and distribute oil in this country, if not the oil companies? The answer provided by our wiseacres, perhaps carried away by the idea of the socialistic pattern of society, is THE GOVERNMENT. But our government should take note, that no government yet has been able to build up a successful oil industry, although many have tried. The Indian Government may well take note of the experience of the Soviet government in this field. The Soviet government has the greatest potential oil resources in the world, and it runs its own industry. Yet Soviet production and distribution is hardly capable of meeting the demands of but five percent of the total population, and most of the production, is reserved for the use of the government and of the huge war machine. As against this, the average Indian motorist buys nearly 200 gallons of gasoline for his car every year and there is no man-made shortage to stop him.

Where Does Your Money Go ?

What happens to your rupee when you buy petroleum products? If you think that the oil marketing companies keep most of it, you are wrong. Out of every rupee you pay to the oil company for petrol, for example, the company spends 18nP. to procure the product and 8.5 nP. for distribution. Another 6 nP go in commission to the dealer who is an independent Indian businessman. And the lion's share, 66·5nP. go to the Government in taxes and duties. Upto the 27th September of 1961, the oil companies were left with 1 nP. for every rupee you spent, but since that date the excise duty has been increased, with no corresponding increase in the selling prices.

What has Happened to Oil Prices ?

Even taking into account the stupendous taxes put upon it, the price of PETROL at the pump has remained the same for five years while prices of most other things have gone up. As for KEROSENE AND DIESEL OIL, the price paid by the consumer has risen because of tax increases. But the prices of all THREE products, excluding taxes, has actually gone down. Specifically, the selling price of a gallon of KEROSENE, not counting taxes, was 79 nP. in 1956 and is 61 nP. today. DIESEL OIL priced at 83 nP. per gallon five years ago, now stands at only 72 nP. The selling price, exclusive of taxes, for a gallon PETROL in 1956 was Rs. 1·08 nP. whereas today it is only 91 nP.

Some hard truths

Whence do the oil companies get their money? Out of the earth? Oh, no. Oil brings wealth only as it is transformed into useful goods, which are then marketed all over the country. The oil companies get their money out of your pockets. They coax it out of you with bargains. You can have all the gasoline you want, at the prices fixed by the government. You can have varnish and insect sprays, synthetic rubber and machine oil, nail polish and floor wax. You can have gas in your home and in your factory and liquid gas in tins to hook onto your stoves or refrigerators.

You get some products you did not even know had petroleum in them. It is in your soap and detergents. It is in your nylons, in your lipstick to keep it moist, in covers of books to prevent cracking, in your rain coat, your shoes, your medicine, your paper lamp shades, your roofs.

You pay the oil companies crores of rupees a year for all kinds of things that make it easier to live. And what do these bloated capitalists do with all that wealth? Their thousands of employees get the biggest share of the kitty. These employees are among the best paid in India—certainly better paid than government employees. There are not many strikes, and the rare ones they have, are in the refining industry. In the drilling end things are free and easy.

Government's Share Rupees 119 crores

These oil companies have some crores left after paying their help, so they give most of it to the Indian Government. The oil industry pays the biggest tax bill of any industry in India. Last year the petroleum products' contribution to the Central Government revenues was Rs. 119 crores. If a profit is made after that, the shareholders get their share. Since you customers are so steady now, the dividends over the years seem to add up like compound interest.

Drilling 4 miles Deep

With the crores that are left, the oil companies drill holes at any place that looks as if it might have oil. They drill as deep as four miles; they drill in the desert, in the jungle, in the ocean; the derrick may be standing in stickly waves of heat or may be covered with thick ice. They drill where savage tribes have wrecked the rigs, and where a plane has to bring in supplies and machinery. Sometimes they may spend 75 lakhs of rupees for one hole and no oil at all. They spend millions just to find out where to put the drill down. They pay lakhs of rupees more to other people for the privilege of using their land to drill on. If the drill hits an oil sand, they give the owner of the land a proportionate share of the oil they find.

Pipelines

And what if the oil is next door to the end of the world with no customers in sight? They build a pipeline to the sea or to a refinery, which they also have to build, then build a harbour so that the tankers they build or buy, can take the oil to their customers. They have to put up a lot of cash before you can drive into a petrol pump and say "Fill it up." It may be a year or two before the money begins coming back. It may be ten years. It may be never.

How Crude Oil is refined

Of course, you have no use for that black crude oil, and so the refining comes in. This process takes tons of crude oil and separates the molecules, then pieces them together to give them a new look. There are plants that separate gasoline from gas, and plants that make powdered sulphur out of gas, and plants that only process materials or other plants that make dyes, plastic explosives or drugs. There are plants that take out certain wanted hydrocarbons and put the dry gas back in the oil formation to bring up more hydrocarbons like a dumb waiter.

Huge outlay on Research

A refinery is always expanding, renovating, adding, experimenting, and revising. It has to keep ahead of the customers; it has to provide more gasoline in the summer and more and more fuel in the winter from the same spot and with the same crude oil. The inventions in this line come so fast that you stay in there pitching or go broke. So the oil companies part with a few crores of rupees because they must keep up. The companies also hire some of the top scientists to study how methods in industry can be improved and better products can be made. They have to have big laboratories and smart technical staffs. They have laboratories that test a hundred uses of petroleum in every thing from paints to pavements. The oil industry spends about one fourth of its income on research.

Low Cost Petroleum Shapes our Modern World

Since the end of World War II, the oil industry has spent hundreds of crores on making improvements and expanding facilities in India. Do they expect to make this towering investment pay? In time, yes. And then what will they do with the money they make, these rich oil companies? What they have been doing all along, namely,

1. Drilling more wells and finding more oil so that we will not run short in times of peace and war.

2. Building bigger and longer pipe lines from fields to refineries, from refineries to customers, so that supplies are always readily available.

3. Constructing better refineries and utilising the capacity of existing ones to their fullest, so as to make more products that will fill more needs in the life of every Indian.

So you see why I am tired about rich oil companies! Every one in India benefits from the use of low-cost petroleum products, a use that has launched and shaped our modern world.

FIRESTONE IN FRANCE

The Firestone Tyre and Rubber Company has started construction of a multi-million dollar tyre manufacturing plant in France. Harvey S. Firestone, Jr. participated in corner stone laying ceremonies during the dedication of the new plant which is located at Bethune, 123 miles north of Paris. Bethune is 21 miles west of Lille, an important industrial and railroad centre in northern France.

Experiments conducted by competent bodies like the Imperial Council of Agricultural Research and the C. P. W. D. have proved that bullock carts fitted with pneumatic tyres can carry at least 100% more load than iron-wheeled carts, and unlike them, cause practically no damage to roads. These advantages led Prime Minister Nehru to recommend greater use of pneumatic tyres on bullock carts, which, he said, would "immediately improve the efficiency of such carts by 100 to 200 per cent".

Tractor Tyres

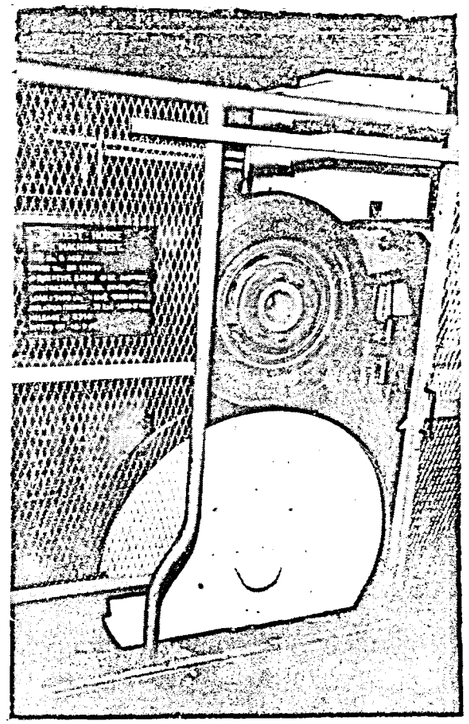
In view of the Third Plan target of attaining self-sufficiency in food production and of increasing the indigenous output of tractors by over 15 times, the demand for tractor tyres is bound to go up. The production of tractor tyres at Sahaganj, which has gone up by 25 times since manufacture commenced in 1948, is expected to increase further to meet the new demands.

Industrial Rubber Goods

The industrial power generation programmes have created new demands for industrial rubber goods like conveyor belting, transmission and vee belts and different types of hoses. To meet this, the Sahaganj factory started manufacturing these products in 1952. Since then production has gone up steadily, and recently the belting plant has been further expanded by the installation of an automatic belt assembly machine of the most modern type.

Dunlopillo

The production of Dunlopillo latex foam has also registered a phenomenal increase at Sahaganj since manufacture commenced in 1951. It is not always fully appreciated that Dunlopillo is primarily manufactured in this country for the needs of transport and the majority of its applications have proved it to have an economic advantage in terms of cost and durability.



A giant tyre being tested on a rotating drum at the Dunlop Test House, Sahaganj.

Research Facilities

In course of these 25 years the Sahaganj factory has developed into an useful institution for imparting scientific knowledge and training in rubber technology. The factory has an elaborate training scheme and a well equipped laboratory, the best of its kind in Asia. Notable contributions in the field of rubber technology have been made by research workers in this laboratory. The factory has now started accepting trainees from various organisations in India and also from neighbouring countries like Pakistan Afghanistan, Burma and Thailand.

A giant tyre being taken out of the mould after vulcanisation at the Dunlop Factory, Sahaganj.

Dunlop's Sahaganj Factory: 25 Years of Production

The Dunlop Rubber Factory at Sahaganj, near Calcutta, the biggest rubber manufacturing enterprise in Asia, completed its twenty-fifth year of operations last month.

Ten Crores Tyres Plus...

This factory went into production 25 years ago as the first large-scale tyre manufacturing factory in India, and has since then produced well over 10 crore tyres of varying sizes and types. Over the years the factory's manufacturing capacity has increased by about seven times, and its range of products has extended from automobile, bicycle and bullock cart tyres to tyres for aircraft, tractors and earthmovers; latex foam cushioning, bicycle rims and a wide variety of industrial rubber products.

Factory Expansion

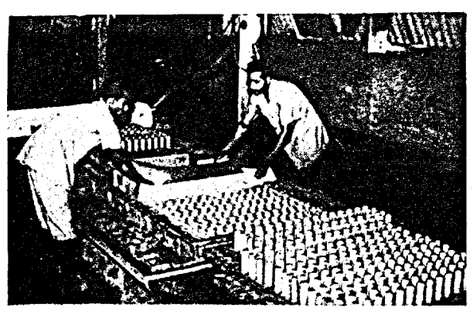
The existing capacity of the factory is being fully utilised, and recently some expansion programmes have been carried out to meet growing demands. The factory has plans for further expansion. For example, tyres for the Boeing aircraft will soon be manufactured for the first time in India at the new aero plane tyre plant of the factory.

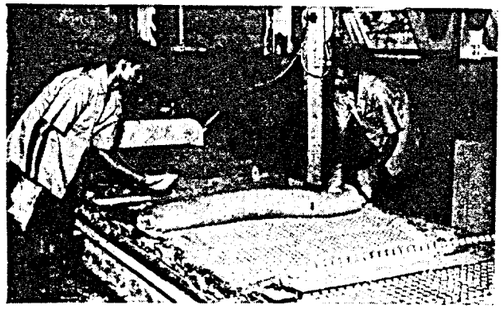
Automobile Tyres

During the last 10 years production of automobile tyres at Sahaganj has gone up by over 40% and that of bicycle tyres by over 95%. The factory now supplies about 60% of the country's automobile tyres and 80% of the bicycle and cycle-rickshaw tyres. Increased manufacture of bicycle tyres has enabled the company to export sizeable quantities of this product to markets in South East Asia.

A.D.V. Tyres

Among the other types of tyres manufactured at Sahaganj, pneumatic tyres for bullock carts, better known as A. D. V. tyres, have made an useful contribution in the country's development where, the ancient bullock cart still remains the staple means of transport.





A Dunlopillo bus seat being taken out of the mould after vulcanisation at the Dunlop Factory, Sahaganj.

INDIA'S BATTERY INDUSTRY FORGES AHEAD

Today, the battery industry saves a large amount of precious foreign exchange. Before World War II, India's annual expenditure on battery imports, for automobiles alone, totalled over one crore of rupees. Till recently, many special types of batteries were imported, involving a drain on the country's foreign exchange resources.

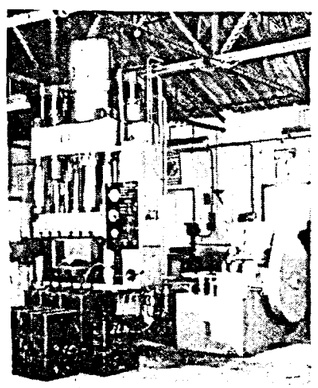
It is therefore most fortunate for India that batteries of the highest quality—not only for cars, but also for buses, trucks, ships, aircraft, and railways are now being made in India.

Pioneers in the Field

This has become possible largely because of Standard Batteries Limited who were the first in India to manufacture complete car batteries in 1945.

There are many other battery manufacturers who have come into the field since those early days of battery-making in India, but Standard Batteries Limited are still among the foremost national battery manufacturers. They now manufacture batteries for all automotive and special purposes—eliminating the need to import foreign-made batteries—to meet the country's rapidly growing requirements.

Shri M. S. Muthanna (Centre), General Manager, Telephones, Bombay, recently visited Standard Batteries factory at Santa Cruz. Picture shows Shri Muthanna being shown round the factory by Shri L. D. Char (Extreme Left), Director of the Managing Agents of the Company.



One of the 200-ton Hydraulic Presses installed at Standard Batteries' factory for making RPg railway battery containers.

This has been achieved within a relatively short period of 15 years. Today, 'Standard' Batteries are backed by some of the world's most advanced battery-making research. The company's personnel work on up to date plants and employ some of the latest techniques now being used abroad.

Famous Patents

In addition, the rights have been obtained on several world-famous battery-making patents for exclusive use in India by Standard Batteries Limited.

The role which these patents have played in revolutionising the country's battery industry can be gauged by studying battery-making developments during the last hundred years. Though battery types have remained more or less unchanged since the 19th century, great improvements have been made, especially in regard to capacity and quality.

The first lead-acid batteries were simple: lead sheets immersed in sulphuric acid. Some improvements were envisaged, but with the battery's transformation to its present form — even today most conventional batteries have merely pasted plates and wooden separators—all practical progress came to an end.

These conventional batteries were all right for their limited applications but industrial progress soon demanded more efficient, specialised machines, such as aircraft, heavy-duty vehicles, fork-lift trucks, tractors, steamships and diesel engines—which need modern specialised batteries. Such batteries are now being made for top performance and durability with the use of tubular plates ..first introduced a little over a decade ago.

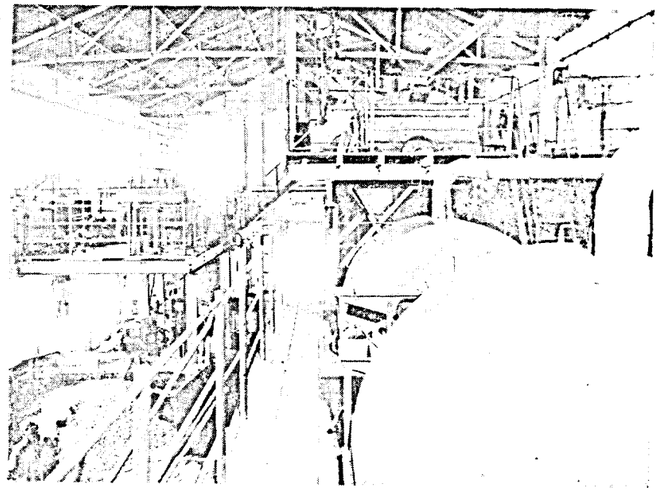
Revolutionary Tubular Plate

The tubular plate is recognised as the first major step in the advancement of battery-making technique. The positive plate, instead of being flat, consists of a row of tubes made of slitted hard rubber. These tubes contain the active material within, unlike the flat plates which had the active material pasted on the outside. These tubular plates retain the active material whereas the flat plates shed it gradually.

Thus the tubular plates reduced battery breakdowns which used to result from shedding of the active material...to increase battery life up to *two and a half times!* There is an additional advantage, too. Tubular plates hold more active material than it is possible to paste on flat plates. The more the active material, the greater is the power capacity of the battery. Thus tubular plates have naturally a far higher power capactiy.

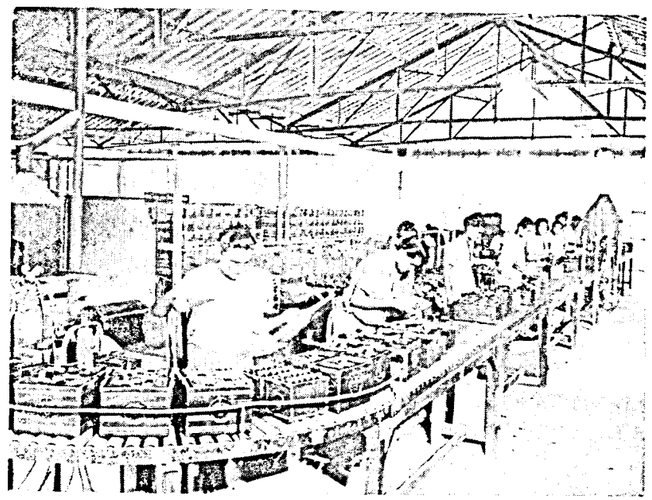
Many types of slitted tubular plates were developed subsequently but none of them proved to be an appreciable improvement on the earlier tubular plates.

The next major advancement—in fact, the greatest battery-making development in recent years—came with the invention of the Pg Positive Plate. This patent has today attained immense popularity in Sweden, Norway, Denmark, Germany, U. S. A. and U. K.



The Standard Batteries' Oxide Mill.

Pg batteries are now being made in India, too — exclusively by Standard Batteries Limited under Indian Patent No 47394 — for buses, trucks, tractors, fork-lift trucks and other industrial trucks.



A view of the automobile battery assembly line at the Standard Batteries factory.

New Construction

The Pg tubular positive plate consists of a row of thin perforated P. V. C. tubes with spun glasswool lining. Inside each the active material is packed around a thin special-alloy lead spine.

The Pg Tubular Plate presents many advantages over the slitted tubular plate. P. V. C. tubing has such great mechanical strength and rigidity that its walls can be kept very thin. This makes more space available for the active material and helps to add 30 per cent more latent power to the battery.

Besides, the spun glasswool lining of the Pg tube ensures that the active material is not shed. This contributes to an even longer battery life. At the same time, the prevention of shedding eliminates the need for the usual extra space at the bottom of the battery for active material. This makes it possible to use longer plates which increase power capacity by another 10 per cent.

Again, since the P. V. C. wall is well perforated and the glasswool lining is very porous, the electrolyte has greater freedom of access

WHAT IS A BATTTERY ?.... *By I. C. Anand*

A battery is nothing more than a device which may be used repeatedly for storing energy at one time, for use at another. This energy is stored in a chemical form and is delivered from it in an electrical form.

Components

The battery used on automobiles consists of a Container, Top Covers, Vent Plugs, Positive and Negative Plates, Separators and chemically pure Sulphuric Acid (electrolyte)

Container

The Container is usually made of hard rubber or bituminous materials, both acid resisting. The 6 volt batteries have 3 compartments whereas the 12 volt batteries have 6 compartments and each compartment or cell is of 2 volts.

Top Covers

The Top Covers are also either of hard rubber or a bituminous product with 3 holes in them to keep the elements of the cells in their position.

Vent Plugs

The Vent Plug has the function to allow the electrolyte or distilled water to be poured into each cell. This vent plug has a hole on the top of it or at the sides to not only prevent the splashing of acid, but to allow the gases to escape through the hole and if this hole is blocked by allowing the dirt to settle on the surface of the battery and vent plug, the gases being unable to escape, sometimes the container explodes.

(+) & (—) Plates

Both positive and negative plates have as their backbone a cast grid made of a stiff alloy of lead and antimony. This grid work of the battery plate is pasted with lead oxides and after formation(cooking) the colour of the positive plate is chocolate brown peroxide of lead, and gray spongy lead on the negative plates.

Separators

The Separators used in the batteries are of either chemically treated wood, rubber, perforated plastic sheets etc. Some manufacturers have tried to use a fine sheet of glass wool separators along with thin sheets of wood separators, but in an automobile battery this fine sheet of wood separator has no function to perform because there is no chance of growing lead trees in a cell. However, in the stationary batteries, this glass wool of ¼" thickness is wrapped round the plate and wood separators to prevent this process. The function or duty of a separator is to keep the negative and positive plates apart. This is necessary, because if any part of one group should come in contact with the other, it would produce a short circuit inside of the battery.

Electrolyte

The electrolyte is a solution in the battery and consists of a definite mixture of chemically pure sulphuric acid and distilled water. The ordinary cremonial sulphuric acid, must not, on any account, be used as it usually contains minerals which are highly detrimental to the plates. Great care has to be exercised when handling and mixing acid as it is extremely dangerous if handled incorrectly. The acid slowly and carefully must be poured into the water. If this operation is reversed, that is if the water is poured on the acid, great heat is generated giving off violent boiling which may not only cause ruined clothes but also seriouly injure the person. The liquid must be also thoroughly stirred with either a piece of clean wood or a glass rod to mix the electrolyte and sufficient time should be allowed for the liquid to

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to the active material. The electric resistance inside the battery is thus considerably reduced.

'Mitex' Separator

Another step forward was the introduction of the MITEX Microporous Rubber Separator with spun glasswool mat reinforcement.

The MITEX Separator is made to withstand the effects of sulphuric acid up to 50 per cent concentration of temperatures up to 80° C and lasts longer than the battery itself. It eliminates another major cause of failure: oxidation or corrosion of the separator by acid.

The MITEX Separator is made in India by Standard Batteries Ltd. and used in all 'Standard' Batteries, Together with the Pg technique, it ensures for Pg batteries longer life, lower battery costs per annum and larger power capacity.

'Instant Power' Batteries

The 'Instant Power' Battery, another patent which is very popular abroad, is of even greater importance in our country where charging facilities are not always easily availabe for lack of electricity. These precharged batteries, made by Standard Batteries Limited need only to be filled with electrolyte to be ready for use within minutes!

Indian Batteries in Foreign Markets

Today, Indian batteries are powerful, dependable and economical. In quality, Standard Batteries are equal to the world's best, and are already earning foreign exchange in the face of strong foreign competition. Shipments have been made to several countries, including Ceylon, Turkey, Burma and the Middle East.

Standard Batteries Ltd. have secured expert foreign collaboration and revolutionary patents. They have thus helped India's battery industry keep pace with the latest battery trends anywhere in the world!

cool before being poured in the cells.

Preparing a New Battery For Service

Now the battery is ready, but before it can be put into service, it has to be charged. Where there is a A. C. Currrent, a charging device called Battery Charger s used. The function of this machine is to convert A. C. into D. C. and also bring down the voltage pressure from 110, 220-250 or 460 volts to either 7·5 volts or 15 volts for 6 and 12 volt batteries respectively. Where there is a D. C. current, this battery charging machine is not required but to reduce the voltage pressure to the requirements of a battery, a resistance has to be put between the main current and the battery, otherwise, with heavy voltage pressure the battery will be ruined in a very short period while on the Charging Bank.

Places where freezing of water seldom or never occurs are regarded as having tropical climates. The automobile batteries operated in our country with weaker solution give far better results. The specific gravity of a fully charged battery should not be more than 1225° to 1230° at 80°F. whereas in cooler climates the specific gravity should be 1240° to 1260° at 80°F.

Battery Charging

The electrolyte is poured into each cell of every battery. After filling all the cells of the battery to a height of $\frac{1}{4}$" above the separators level, it is allowed to stand for 12 to 16 hours to cool down and also allow the elements to be well soaked before starting the initial charge and then it is given a long initial charge. It is usual to charge the battery at the normal rate as specified by the manufacturers. This charging is continuous for at least $\frac{3}{4}$ths of the period, after which the amount of charging current is reduced or the charging is sometimes discontinued for a very short period, if necessary, in case the temperature of the electrolyte during the charging process is found to exceed the temperature of 100 deg. F. This care has to be taken, for the life of a battery depends to a great extent upon this primary charge. Failure to take this precaution may seriously injure the elements. The battery is considered completely charged when each cell shows a voltage of 2·5 to 2.7 volts and the specific gravity has risen to the value stated by the makers. That is, the voltage and specific gravity shows no rise over a period of three hours.

Installing the Battery

The battery cradle must be well ventilated, the battery should be firmly secured in the cradle so that it does not bounce while the vehicle is in motion, otherwise there is chance for the container to break elements to disintegrate and cut short the life of a battery: connect the positive charging source to positive pole (painted red or marked P or +) of the battery, and the negative charging source to the negative pole (marked N or—) of the battery. The connecting cables must be flexible and sufficiently long to prevent any pull on the battery terminals.

Maintenance

For efficient service and better performance, keep the outside of the battery clean and dry, the cells do not require the addition of any electrolyte because only Distil Water evaporates and not the acid, therefore add distil water regularly and never allow the plates to become exposed to the air; this portion if affected by the oxygen in the air, becomes oxidized and such plates lose service, life and efficiency which results in failure earlier than the usual life of a Battery! Avoid discharge as a constant practice and never allow the battery to stand in a discharged condition for any length of time, give it a complete refreshing charge often enough that the plates are never starved or become covered with sulphation. Dampness and dirt permit the electric current to leak away. The connection and the surrounding parts must be kept clean and dry.

Battery Troubles — Causes and Remedies

1. Overcharging
2. Sulphation
3. Loss of capacity
4. Impurities

There are two possibilities of OVERCHARGING, as has been explained. When the water evaporates some quacks advise the addition of more electrolyte. This increases the strength of the acid, which attacks the separators, and they become charred. The plates touch each other producing a short circuit and there is so much heat that the grid frame of the plates expands, boils the solution, and splashes out. Sometimes the container also explodes, the active material becomes loose, sheds out and falls. Although there is a device (Voltage Regulator) to regulate the current, sometimes this too does not function well and overcharging continues. Therefore, it is necessary not to add acid, but to keep the voltage regulator always fully tuned up. Always pour in every cell DISTILLED WATER to top up about $\frac{1}{4}$" above the level of separators. However, if the acid is spilled out then add acid to make up the deficiency.

Sulphation

The sulphation of plates is a white plague of the batteries, which is very difficult to remove. The causes are either that the battery has been kept idle for a long time or the vehicle has too little running, perhaps less than 15 miles per day. The power consumed while cranking the engine does not get replaced or the battery connections are not connected tightly or the terminals are corroded and prevent the current passage or the cables are undersized. Therefore, if the battery is idle, give it a refreshing charge every 15 days; the same process must be repeated if there is inadequate running. Check the connections often and keep them well smeared with pure vaseline (not grease) and use cables of well known makers only.

Loss of Capacity and Impurities

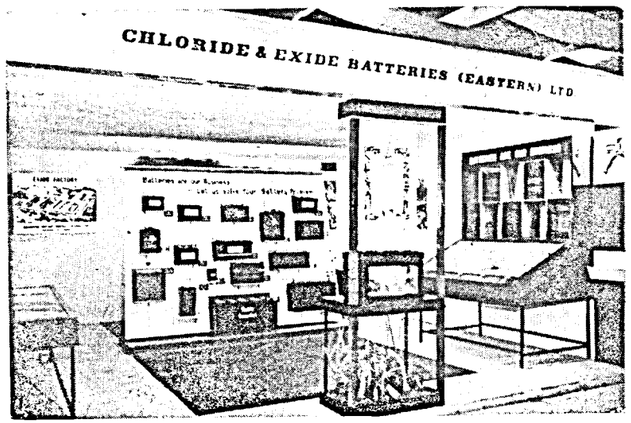
The loss of capacity results if the running of the car is inadequate.

BATTERIES ARE OUR BUSINESS

The theme 'Batteries are our Business" is cleverly and attractively developed at the C loride & Exide Stand in the U. K. Pavilion at the Indian Industries Fair. The display features models, charts and photographs demonstrating the latest advances in battery design and technique.

Included in the Exide display is a novel exhibit - a glass aquarium complete with tropical fish and interior lighting. The basic purpose of this exhibit, however, is not to arouse mere curiosity about marine life, but to provide a 'working model proof' of the porosity of the 'PROVIC' plastic separators incorporated in Exide batteries. Air pumped through a sheet of 'PROVIC'immersed in the aquarium demonstrates clearly the microscopic pores of this revolutionary separator material. This porosity is an essential property in separators because in batteries, separators not only have to form an insulation between adjacent plates, but also allow free access for the acid without any chemical deterioration. Actual service tests have proved that—PROVIC', an Exide invention IS the greatest single advance in battery manufacture for many years.

The Exide stand also exhibits the wide range of batteries which the Company manufacture, from the familiar compact Exide Motor Cycle battery to the giant Chloride Stationary battery weighing many tons which provides power to numerous telephone exchanges, hydro-electric projects etc. throughout India. Also displayed are the special batteries designed by Exide to meet specialised applications in the Army, Navy and Air Forces in India.



The Chloride & Exide stand in the U. K. Pavilion at the Indian Industries Fair.

The quality of the Exide-India production can be clearly seen from a comprehensive range of components and batteries on display all of which are produced at Associated Battery Makers fine Factory near Calcutta.

Another most interesting item in the Stand is an electric quiz which allows for visitor participation. It is operated by an electric switch board and demonstrates the application of various types of batteries for specific jobs.

The 'Photographic Section' of the Stand contains numerous illustrations with special emphasis on Research & Development and the world - wide tie-up of the Chloride Electrical Storage Co. Ltd., U. K. Organisation. Here, visitors will get an idea, through photographs, write ups and charts, how Exide units in every part of the world collect data on battery performance in their own specific regions and then forward it to Research Headquarters at Clifton, near Manchester for analysis. Clifton is more or less the nerve centre of the organisation, where physicists, chemists, and engineers are continually at work, devising ways and means to improve battery performance and lessen costs for consumer benefit. The result of their findings are immediatley made available to all Chloride Group factories. Thus a battery improvement devised at Clifton is put into operation at the Shamnagar Factory of Exide, near Calcutta, within a short time of the proving of original development. Because of this process of pooling information and constant research, Chloride & Exide have maintained their lead in battery manufacture for over fifty years, and it is this aspect of the organisation that is most forcibly impressed on the visitor to this Chloride & Exide display.

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the level of the solution is below the elements of the cells. There is local action due to some impurities having accidentally entered into the cells. The top of the battery is dirty. It has already been suggested as to how to keep a battery fully charged, in the case of impurities. p o u r the entire solution, wash thrice every cell with distilled water, then fill up every cell with the electrolyte and recharge. The d i r t y top allows the current to escape, therefore, it must be kept absolutely clean and dry.

However, all these reqnire the attention of technical experts. It is preferable to approach some reputable service people to get better service and more performance from a battery.

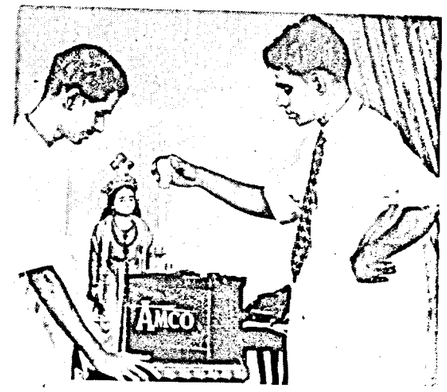
TOPPING THE CELLS

By Amco Chokkiah

The Battery which is the "HEART" of a car, requires much care and attention in its maintenance and upkeep. A car owner or driver can avoid many of the 'Battery Troubles' by keeping the battery in good trim.

Topping up of cells of a battery periodically with distilled water is of fundamental importance. Every time this is done, a gassing charge should be given to the battery by driving the vehicle over a long distance, so as to keep the electrolyte well stirred in order to maintain an uniform density throughout.

The level of electrolyte in each cell should be maintained at a half inch above the tops of the separators. It is essential to see that the entire area of the plates and separators is in contact with the electrolyte, as otherwise they become exposed to the open air and get h e a v i l y sulphated. Usually, sulphation reduces the capacity and shortens the life of battery. Distilled water alone should be used for filling up the cells. Well-water or tap-water should not be used at all because they contain various mineral salts and chlorine which in due course will destroy the cells, undergoing i n t e r n a l chemical reactions.



On the right, Amco Battery Expert, Sri Chokkiah.

Generally, Automobile Batteries are assembled in hard rubber containers and therefore the level of electrolyte cannot be seen without removing the vent plugs of the cells. The level can be determined with the aid of an instrument called the "Hydrometer." This consists of a long thin glass barrel with a rubber bulb syringe for drawing out the electrolyte and a glass-float with calibrated specific gravity readings. A hydrometer helps to determine the capacity of a particular cell of the battery.

The lowering of the level of electrolyte in a cell depends upon the running distance of the vehicle, climatic conditions, and the charging rate of the generator. If the level goes down frequently even under normal climatic conditions, it is an indication that the generator is charging at too high a rate. In such instances the Dynamo and the Voltage Regulator must be adjusted properly in a well equipped Service Station.

Sometimes, colourless liquids such as kerosene, alcohol or turpentine are mistaken for distilled water and added to batteries by the drivers or the cleaners of lorries and buses. In such cases the electrolyte must be removed completely from the cells immediatley together with the impurities and the cells should be washed clean with fresh distilled water before refilling with electrolyte of the same specific gravity.

Thus you see that topping of the cells is an important factor in the proper maintenance of batteries for ensuring a pleasant and smooth drive, and trouble - free running

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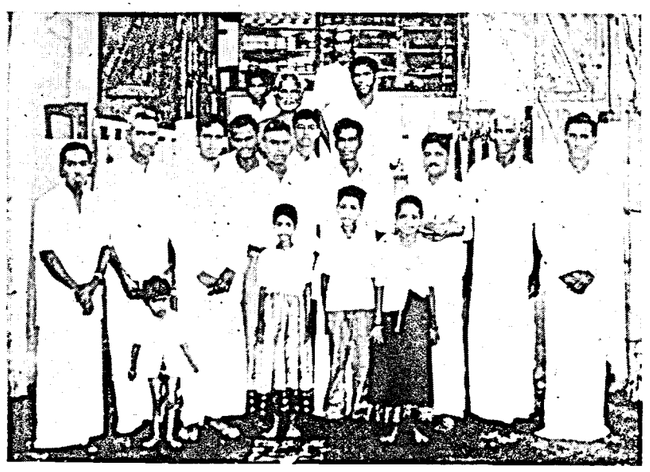
NEW AUTO SHOP AT TIRUCHIRAPALLI



Messrs V. Chokkiah, V. Rajan and R. Balasubramanian recently celebrated the opening of their firm, The Imperial Automobiles at Butterworth Road, Tiruchirapalli-2, opposite to the Imperial Trades, Battery Dealers. They had got up a pleasant function at their new premises, at which the trade was well represented and messages of congratulations were received from well wishers all over the country.

Mr. MANUBHAI SHAH

Visits

ACME BATTERIES

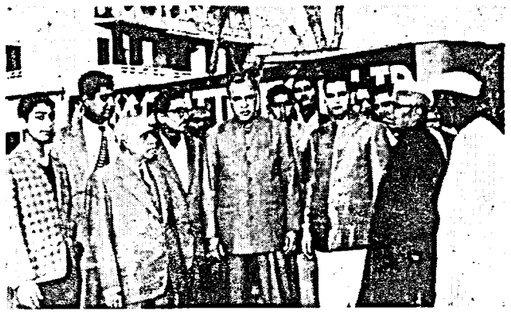


Photo taken on the occasion of the recent visit to the factory of Messrs. Acme Batteries of Industries Minister, Mr. Manubhai Shah, shows the Minister with Mr. A.R. Suri, Chairman, and others.

A COLD AND DAMP BATTERY CAUSES hard starting

Is your engine hard to start these days? That's probably due to the recent cold wave.

Many parts of India have been getting more than their fair share of cold and wet weather recently —and more than the usual number of motorists have been finding their cars reluctant to start.

Hard starting is often caused by slight electrical faults which may not be noticed in fine weather but are accentuated when cold or damp conditions prevail. Batteries which have seen considerable service often fail when called upon to start a fairly stiff engine after a cold or damp night.

Battery Care

There are many ways in which the battery may be hampered in the task of delivering its full charge, but the most common power-waster is terminal corrosion.

Sulphated connectors to the battery terminals impose a considerable electrical resistance, which can make all the difference between a start or a non-start when an additional load is put on the battery.

The connectors should be removed from the battery, thoroughly cleaned together with the battery terminals, lightly smeared with vaseline, then replaced.

Where the sulphating is very bad, it may be difficult to remove. Here several applications of strong ammonia will quickly dissolve the deposits—but do not allow the ammonia to come into contact with the electrolyte, otherwise it will neutralise it.

Very often the connectors are difficult to remove due to excessive sulphating. Again, use the ammonia treatment, then apply a fairly hot spanner to the binding nut, hold it in position a few moments to expand the nut, then turn. Do not under any circumstances, apply excessive force in removing the connectors, otherwise you may do some expensive damage to the battery.

Clean Earth Essential

Another possible weak link in the electrical system is a poor earthing connection.

The usual procedure is to bolt the earthing cable or strap to a convenient point on the bulkhead, and often rust forms beneath the connection to form an electrical resistance.

Where this is suspected, the connecting bolt should be removed, all contacting metal parts thoroughly cleaned with emery paper, lightly smeared with vaseline, then replaced.

Generally speaking, bad connections caused through sulphating at the battery terminals or due to a poor earth, result in a sluggish starter-motor action, with starvation of input to the coil and consequent difficult starting, although very similar symptoms will result from a run-down or very old battery.

Usually under these circumstances you can get started by cranking, as all the available output of the battery can then be applied to the coil. Unfortunately many modern car manufacturers consider — quite wrongly, of course—their cars are too good ever to need cranking, and so don't bother to fit them with a crank-handle.

Keep a Good Charge

With the compensated voltage control which is incorporated in the charging circuit of modern cars, the battery, provided that it is in good condition, is maintained in a state of full charge and has an adequate reserve of power for any demands that may be called for.

On older-model cars, the usual arrangement is for a half and a full charge resistance to be incorporated in the charging circuit—the half-charge to be used during the summer months and the full charge during winter, when more demands are made upon the battery.

It often happens that the full-charge circuit provides insufficient current to maintain the battery at full charge in the cold months, especially if the car isn't used much or has extra electrical accessories fitted.

The generator output in such a system can be increased by slipping the commutator cover off and slightly moving the regulating or third brush in the direction of commutator rotation. It should be clearly emphasised that the output must not be increased by more than an additional two to three amps above the normal reading on full charge, otherwise the generator may overheat and burn itself out.

DEPARTURE OF MOTOKOV'S DEPUTY MANAGER

A photograph taken at the Santacruz Airport on the eve of departure of Mr. Ivan Peter. From left, to right are: Mrs Shashi Sharma, Master Pappu Sharma, Mr. S. K. Chakravarthy, Partner, M/s Overseas Agencies, Bombay, and Mr. Ivan Peter, Deputy Manager, M/s Motokov, Dept. 74, Praha, Czechoslovakia.

HIMCO BATTERIES' PROUD RECORD

In 1937, Himco's Director K. R. Anand, conceived the idea to start manufacturing Electrical Parts for popular automobiles on the road. Battery Cables were the first on their production list. They were produced technically and mechanically to perfection to serve the purpose for which they were meant. Today automobile manufacturers in India use Himco Cables as original equipment.

In 1942, the Hindusthan Manufacturing Company was incorporated into a limited liability Company under the name and style of Himco Limited. Battery plates were first produced by this company and put on the market. Next came the turn of complete batteries which were also given a good reception and earned a good reputation. It was noteworthy that the entire equipment, to produce battery plates, battery cables and batteries, was developed and designed right within the four walls of their factory, and Major Allen, deputed by the Government of India to survey the manufacturing capacity of our country in 1943, was surprised to find, that, unlike other manufacturers, Himco's entire manufacturing plant was their own creation.

Railway Electrical Parts

In 1945, Himco turned their attention to Railway Electrical Parts, which were of a complicated nature and required a good deal of experiment, skill and patience. They sucessfully produced the railway materials for electric trains, to the entire satisfaction of the railway engineers and the Supplies Department. They also manufactured Full Wave Selenium Track Rectifiers and Luminous Indicators for the Railway.

In 1946, on re-organization, Himco (India) Private Ltd. was incorporated.

Ignition Parts

In 1952 Himco directed their energies to a highly technical and complicated line to experiment, develop and produce the Ignition Parts for the popular automobiles on the road in India and 95 percent of the raw materials required to produce these parts, were developed by them in India. Himco Horns, Horn Relays, Gasolene Tank Gauges, and Dimmer Switches, at present, have been accepted by leading automobile manufacturers as original equipment.

Electrical Equipment

In 1956 Himco took up the manufacture of Water Distilling Stills, Battery Chargers, Lead and Aluminium Melting Furnaces, Spot and Seam Welders, Ovens—all operated by electricity. Their equipment has found a good reception not only in the industry but also in various Government departments throughout India. They are one of the leading manufacturers of these industrial machines in our country.

Himco—T.P.M. Merger

In keeping up their tradition, for service and progress, to give shape to their expansion programme, and to provide better service to their customers, Himco (India) Private Ltd., and the Tin Printing & Metal Works Ltd. are being merged together. A new company with a capital of Rs. 75,00,000 has been incorporated.

Collaboration Agreements

The company has already secured a development manufacturing licence for the scheme. The collaboration arrangement with Messrs. Merit-Werk, Gummersbach, to manufacture all electrical components for automobiles for home consumption and export, has been completed. They have also completed collaboration arrangements with Messrs B&R Relays Ltd., Harlow, U. K. to manufacture Coaxial, D. C., A. C./D.C. Relays, Mercury Switch Relays, Miscellaneous Relays, Siemens and Halske Relays.

Manufacturing Programme

Their manufacturing programme has been phased to produce Lead Storage Batteries, Battery Cables, all types of Relays, Hydraulic Jacks and machines, all types of Spot, Seam and Butt Welders, Water Distilling Stills, Battery Chargers, Tin Containers, Cartons and allied products, Industrial and Domestic Ovens, Ignition Electrical Parts for Automobiles, Electric Horns, Voltage Regulators, Ignition Coils, Lead Oxides for batteries and paint industries.

The headquarters of this organization is being built up at 14·5 Mile, Talpat Range, Mathura Road, Faridabad—Delhi, on their own landed property of about 5,10,055 sq.ft. to house the Administrative Office, Development/Research and Production/Planning Departments, where constant endeavours are being made to find out new materials and new methods of production. The factory on 9,00,000 sq. ft. at Andheri, will in future, manufacture Lead Storage Batteries, Cables and Lead Oxides for which an American Automatic Plant costing over Rs. 6,00,000 has already arrived and is being installed. Their Associates, the Himco Batteries (Madras) Private Ltd., Madras, at present manufacture Lead Storage Batteries, but steps are being taken to open some more electrical and mechanical sections. The erection of another factory at Calcutta is also under active consideration.

They have at present three Service Stations—one at Sandhurst Bridge, Bombay-7, another at 52, Scindia House, New Delhi and a third at Mount Road, Madras-6. They also have Distributors, sub-distributors and dealers throughout India in all towns, so that they can serve the trade with promptness and efficiency.

In almost 25 years of service to the nation, the company has designed, developed and manufactured their own machines, jigs and fixtures to save a good deal of foreign exchange.

BATTERY FOR A LIFETIME

The Nickel-Cadmium Battery

One of the motorist's biggest headaches is his car's battery. If it is left unattended, it goes dead; if it gets low in extremely cold conditions, it is likely to crack. Hard jolts on potholed roads may break its hard rubber case, and without frequent additions of distilled water, it may cease to function altogether. Even with the best of care, it has to be replaced every two years, which may mean the purchase of at least eight new batteries for sixteen years of the car's life.

One Battery For 20 years

Yet there is a battery which has none of these shortcomings. One such battery will last you for the entire life of your car, and you do not have to purchase another battery for your car. In all probabilities, you should have to buy a new car for your battery, because it will last from fifteen to twenty years.

Not Known in India

The nickel-cadmium battery has been used fairly extensively in Europe for more than fifty years, but most people in India have hardly heard of it, and very few Indians are using this battery in their cars. But one enterprising person installed one in his car about four years ago and he has run it for over 50,000 miles without adding any distilled water and it is still full of life. Another Bombay man put these batteries in his diesel-powered yacht and laid it up for nine months without any attention. Then, when he stepped on the starter, the engines roared into life.

Swedish Inventors

The nickel-cadmium battery was first produced in Sweden in 1909, and it is now manufactured in a dozen other European countries including the Soviet Union. It is used in thousands of buses, diesel locomotives, air conditioning plants, yachts and liners, and in small portable electric lamps. The Queen Elizabeth, the Queen Mary and the Normandie, great ocean liners, all carried these batteries as sources of power in emergencies. The Germans used it in their V-2 rocket and Allied forces used it in planes, tanks, submarines and other fighting equipment. Using parts made in America, the Russians had four factories turning out the battery during the last war.

Revolutionary Process

The lead-acid battery, with which we are all familiar, generates electrical energy through the chemical reaction of a solution of sulphuric acid on a series of lead and lead oxide plates. The new battery delivers power through a chemical change in the plates of cadmium and nickel hydroxide using a concentrated solution of caustic soda or caustic potash, which permits the use of an unbreakable steel container. Acid would eat through this type of container, but the alkali does not react with steel.

Metals in Alkaline Solutions

The battery was invented in 1899 by Waldemar Jungner and Karl Ludvig Berg, who designed and sold a battery-operated fire-detector, known as a "pyrophone". They discovered that dry-cell batteries were not suitable for their purpose as they soon went dead, and hence they began the search for a new battery that would hold a charge during long idle periods. Testing metals which would work with alkaline solutions, they first decided to use nickel and iron. Meanwhile, Thomas Edison, the American electrical wizard, was working on the same problem independently, and at the turn of the century, he also made a nickel-iron battery.

Initial Defects

Both batteries gave trouble, and both manufacturers stopped production in order to do more research. Edison ironed out the snags and continued to manufacture nickel-iron batteries. But the Swedish inventors shifted to cadmium a soft, gray metal obtained as a by-product in the distillation of zinc, and in 1909, they succeeded in manufacturing a battery superior in many ways to all other batteries then available.

Secret Manufacture

By 1920, four firms in Sweden, England, France and Germany, were making nickel-cadmium batteries under various licensing arrangements. Plants in other European countries were manufacturing everything but the active chemical materials, which the "master companies" made by a secret formula and shipped in drums.

Durability

In the course of time, bus fleets and railroads reported that the batteries they had bought twenty years before were as good as when they were brand new. A cadmium battery installed in a Diesel rail car in Sweden in 1913 was still in use at latest report, after starting the engine more than 500,000 times. The cadmium battery became popular in motorcycles because it stood up extremely well under heavy vibration. Many were installed in European automobiles, although the price was about twice that of a lead battery of comparable power.

International Cartel Acquires Control of Production

The lifetime battery caused much anxiety to the producers of lead batteries, which have a normal life of eighteen to twenty-four months. Around 1925, the world's three major manufacturers of lead batteries began to acquire holdings in the cadmium battery firms. These manufacturers were, the Electric Storage Battery Company of Philadelphia, which owned the Willard Battery Company of Cleveland and Exide Batteries of Canada,

Chloride Electric Storage Company Ltd of London, and Accumulatoren Fabrik Aktiengesellschaft (AFA) of Berlin. By 1936 the cartel had established sufficient control to direct policy. Prices of cadmium batteries were then fiixed at about three times those of lead. Even this measure did not discourage buyers. Users all over the world, in Mexico, Brazil, Argentina, Chile, Uruguay, India, Malaya, Siam and South Africa enjoyed its advantages. The cadmium battery penetrated even to Afghanistan and Tibet.

Patents Expired

When the original Jungner patents expired, there was nothing to keep independent manufacturers from making the battery—except lack of technical information. Curious visitors were barred from visiting the battery plants in Europe. The Encyclopaedia Britannica, while devoting eight pages to the lead acid and the Edison batteries, did not mention the cadmium battery at all. Most of the leading physics textbooks used in high schools and colleges all described the lead battery, but not one of them mentioned the nickel cadmium type. Even today few technical men have ever heard—except by accident—of this superior battery with which European engineers have long been familiar.

Manufacture in the U.S.A.

During the last war, American experts, on the search for more efficient equipment, saw the battery and tested it. One of these experts was Lt. Col. H. B. Nichols, who recognised its possibilities for commercial manufacture. At the end of the war Col. Nichols secured the services of Karl Berg, son of the battery's co-inventor and one of the world's leading engineers in the field, and set up the Nickel Cadmium Battery Corporation at Easthampton, Massachussetts. The company is manufacturing batteries ranging in size from a tiny model for a hearing-aid to giant multiple units for diesel locomotives.

Diverse Uses

Oil companies were among the first to realize the tremendous advantages of using the cadmium battery for their oil field pumps. Lead batteries used in starting the engines that drive these pumps usually last only a few months. Cadmium batteries last for over five years and show no signs of deterioration. Cadmium batteries are also used in urban buses and in intercity diesel buses in America, where they go 8000 miles without a drink.

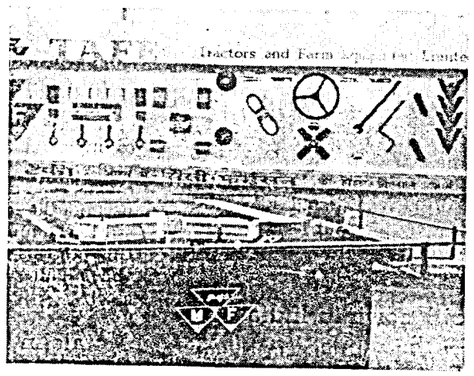
Of great interest to consumers are the tiny cadmium batteries for flashlights and portable radios, as well as hearing-aids. Still in the laboratary stage is a completely new type which, when it is finally ready for production, should replace one of the most troublesome parts of today's automobile.

Crash Proof

The cadmium battery is so crash-proof as to have survived train and airplane wrecks. However, it will not supplant all other batteries; the cheaper lead battery and the dry cell will always be satisfactory for many jobs, and the Edison battery has its own field.

TRACTORS AND FARM EQUIPMENT LIMITED

AT THE INDIAN INDUSTRIES FAIR



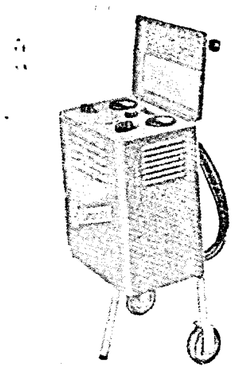
Tafe products arranged neatly in a section of the Amalgamations pavilion.

An attractive scale model of India's largest tractor manufacturing Plant was on show at the TAFE exhibit in the Amalgamations Pavilion, at the Industries Fair at New Delhi. The world-famous Massey - Ferguson tractors and implements will be manufactured at Sembiam, Madras. Construction of the Plant is progressing rapidly and it will be ready for occupation by March 1962.

Tractors and Farm Equipment Limited, formed jointly by the well-known Madras firm, Simpson & Co. Ltd., and the world-wide Massey-Ferguson organization, has been licensed by the Government of India to manufacture 7,000 Massey-Ferguson 1035 tractors a year in this country on a two-shift basis.

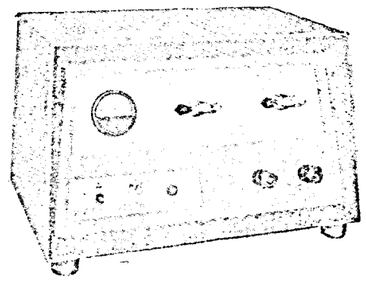
The theme of the TAFE exhibit at the Indian Industries Fair was "Made in India" in keeping with the Indian origin of most of the Massey-Ferguson Farm Machinery displayed.

TAFE also exhibited a number of Indian-made Massey-Ferguson products including Paddy Cage Wheels, Seeding Attachments and Tractor Hoods at the Export Pavilion in the Indian Industries Fair. Massey-Ferguson farm machinery made in India has so far been exported to 27 different countries.



The WZ—Combinatic Battery Charger.

Charger For Car Batteries



The workshop battery charger Type WZ-Combi/SL Freiburg 24/11

When used as workshop charger for car batteries of 6, 12 or 24 volts one has only to adjust the voltage switch of the WR-Combimatic (see fig. 1) to the desired value and the current selector to the ahgo value of the connected batteries. Due to an ingenious construction according to DIN 41774 the charging will take place without attendance and without any readjustment, always with a charge current rate suitable to the batteries and automatically adapted to its charging condition. The maximum current output of the charger of 25 amps permits the full charge of batteries discharged to 80% with a capacity up to 135 ab_{20} in 8·5 hours.

When fast charging of a battery of 6 or 12 volts is intended one proceeds as described above for normal charging. Then one adjusts the fast charging switch with a range of 0—60 min to the desired fast charging time. The current output of the charger increases to about 3 times of its normal value and after expiring of the present fast charging time the timer of the fast charging switch reduces automatically the current to the normal charging value. A red control lamp which lights up at the start of the timer extinguishes and thus indicates that the fast charging is terminated. The fast charging current is 90 amps for a battery of 6 volts and 75 amps for 12 volts with 2 volts/cell. The characteristic current curve guarantees the highest possible fast charging effect without causing a premature increase os the charging voltage to value exceeding the gassing voltage of 2·4 volts/cell.

The workshop charger type WZ-Combi/SL Freiburg 24/11—15 shown in fig. 2, brings with its SL-charging step an eminent technical progress. By this SL charging step the charging output is increased by 35%. With a nominal current of 11 amps the charging capacity is the same as with 15 amps. The current curve and the current values at the charging voltages of 2·4 and 2·65 volts/cell are according to DIN 41774 at all voltage and current settings. After adjustment of the Ah-value range, the charging will take place without any readjustment and without attendance even when charging over the weekend. The batteries will always be charged with a suitable current rate and according to the prescriptions.

Shama Engine Valves Limited Floated

Shama Engine Valves Limited, New Delhi, promoted by Messrs B. K. Khanna and Co Private Limited of New Delhi, was floated recently. The company has an authorised capital of Rs. 30 lakhs, of which the issued share capital amounts to Rs. 15 lakhs. The recent issue of equity shares was well received, and it is reported that subscriptions even in the first two days exceeded the amount offered by 2½ times.

6 Lakhs Engine Valves

The promoters have obtained an industrial licence from the Government of India for the manufacture of six lakhs of engine valves per annum on a single shift basis. Arrangements for technical collaboration have been made with Messrs. Bayerisches Leichtmetallwerk K. G. of Munich, West Germany, world renowned manufacturers of engine valves., which will be manufacturad at the company factory to be erected at Bhopal, and sold under the styling, "BLW—SHAMA". The company will instal modern plants, costing Rs. 17.5 lakhs, geared for mass production with quality and precision.

Rs. 26 Lakhs Capital Subscribed

The initial capital required was estimated at Rs. 26 lakhs, of which the promoters, directers and associates of the company have subscribed Rs. 4·25 lakhs, capital subscribed by the Madhya Pradesh Government is Rs. 1 lakh, loan from banks is Rs. 1 lakh,. loan from the Madhya Pradesh Financial Corporation is Rs.10 lakhs and capital subscription from the public is Rs. 9·75 lakhs.

The Madras Motor Parts Dealers' Association

Sri T. S. Krishnamurthy of The Motor & General Trading Co., 159, Mount Road, Madras-2 was unanimously elected as President for the year 1961-1962. The following were elected to the Managing Committee for the year 1961-62.

1. Sri K. R. Raghavan of Messrs. India Motor Parts and Accessories Ltd.
2. Sri B. I. Chandhok of Messrs. Upper India Trading Co., (P) Ltd.
3. Sri S. Natarajan of the Auto Parts Trading Co.
4. Sri P. Chandriah of the Modern Automobiles.
5. Sri M. V. Chauhan of Messrs. Visram Motors.
6. Sri D. V. D'Monte of the Indian Engineering and Trading Co.
7. Sri S. S. Kalyanpur of the Automotive and Allied Industries (P) Ltd.
8. Sri S. M. Subramaniam of Messrs. Modern Distributing Co.
9. Sri Satya Dev of the Auto Sales Company.

Mr. K. Vasudevan of Messrs. Overseas Manufacturers' Sales Co., and Mr. Sunder Singh of Messrs. Presidency Motors were co-opted to the Managing Committee. The Managing Committee of the Association elected as Office Bearers for the year 1961-62 :—

Vice-President :

Sri S. S. Kalyanpur of the Automotive and Allied Industries Private Ltd., Madras-14.

Honorary Secretary :

Sri B. I. Chandhok of M/s. Upper India Trading Co., Madras-2.

Joint Secretary :

Sri Satya Dev of the Auto Sales Company, Madras-2.

Treasurer :

Sri S. M. Subramaniam of Messrs. Modern Distributing Co., Madras-2.

Annual Report for the Year Ending 30—9—1961

During this year, three Extra-Ordinary General Body Meetings were held, which decided two major issues, viz.

(1) Action to be taken on the Surcharge, which the Government tried to collect from Dealers ;

(2) The handling of goods imported through the State Trading Corporation of India Ltd.

Surcharge not to be Collected

The Association successfully fought the first issue, as a result of which, the Government finally issued an order confirming that Surcharge, as distinct from Sales Tax, is not liable for collection by the Government.

S.T.C. Imports

While the goods imported under licence by the State Trading Corporation of India Ltd., have not yet arrived, indents have been placed and the Association is making further efforts to procure Licences to import other items also from rupee payment areas.

Enhanced Entrance Fee

During the first of these 3 Extra-Ordinary General Body Meetings, it was decided to increase the entrance fee from Rs. 10/- to Rs. 150/- and two members have been admitted at the new rate of entrance. The membership today stands at 131 as against last year's figure of 111; thus giving a revenue of Rs. 11,615-05 under this head as against Rs. 7,418-35 last year.

New Articles of Association Drafted

During the course of this year the Managing Committee met 19 times and these numerous meetings were mainly to discuss and solve the surcharge problem and to draft the new Articles of Association.

Another sign of the close co-operation of the members was seen at the two picnics organised ; one at the Camp Tonakela and the other at Poondy. Both these were full of fun for all members, who are now clamouring for more such events.

Flood Relief Donations

This year saw the members get together to do their little bit for flood relief also. Members' contributions totalled Rs. 1275/- and of this Rs. 600-80 was given towards a donation of rice at Madhavaram Village and the remaining Rs. 673-10 to the Ramakrishna Mutt Mission Relief work.

All India Federation

The All India Federation, which should have been registered quite sometime back has been delayed inordinately due to circumstances beyond the Association's control. As a result of the Managing Committee exerting full pressure upon all members it is hoped that early next year the Federation will finally be registered.

Talks with other Associations

In this connection the Honorary Secretary called on the Bombay Motor Merchants' Ltd., and Calcutta Motor Dealers' Association once and twice on the Delhi Motor Traders' Association. Discussions were held to strengthen the Associations in general, and useful tips were received and given to solve common problems. The Vice President also called on the Delhi Association and Mr. Agarwala, the General Secretary of Calcutta Motor Dealers' Association visited the Madras Association.

Annual Dinner

The Annual dinner at New Woodlands, was presided over by Mr. C. T. A. Pillai, Collector of Customs. Mr. T. S. Krishnamurthy, President, welcomed the gathering, and Mr. C.T.A. Pillai responded fittingly to the felicitations. A full length technicolor film was shown. Mr. Indu Chandhok proposed the vote of thanks.

M. M. P. D. A. Annual Day Celebrations

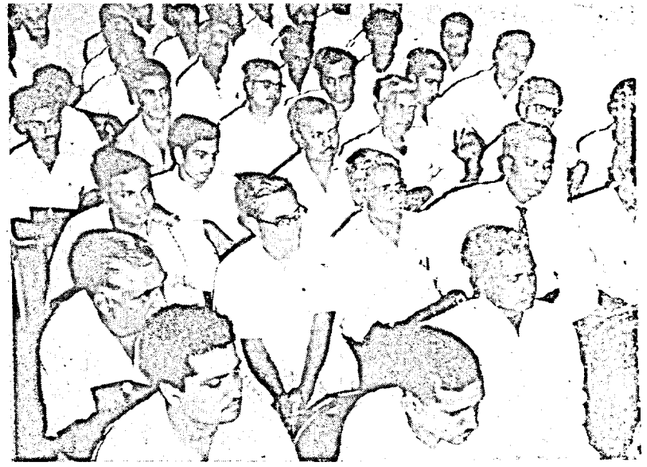
(Top right) : The General Body of the Madras Motor Parts Dealers Association photographed at their annual meeting.

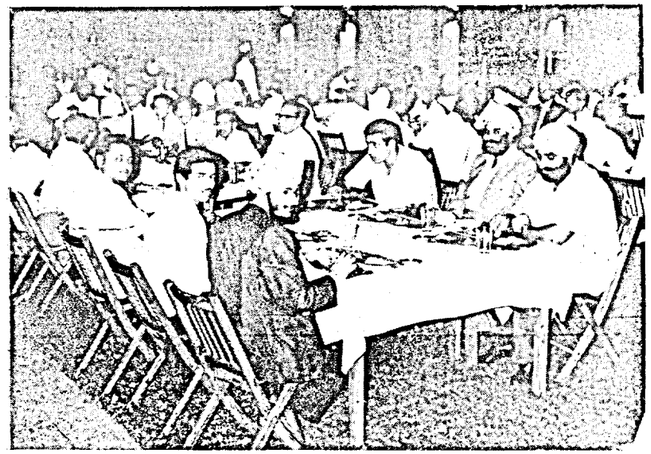
(Centre right) : A section of the Motor Parts Dealers and their guests at dinner at their Annual Day celebrations in New Woodlands Hotel.

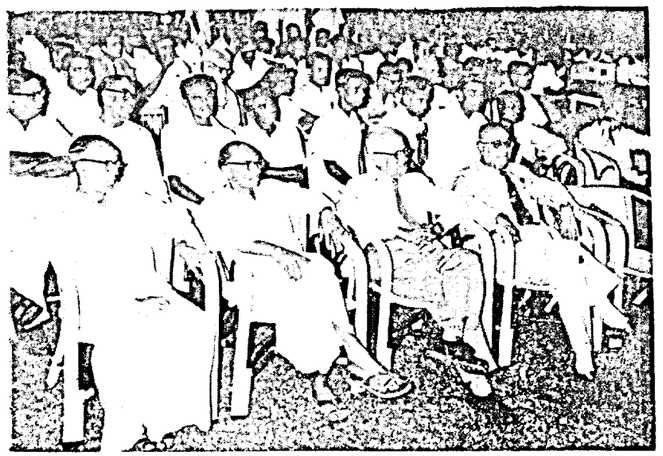
(Bottom right) : An interesting full length technicolour film was shown to the dealers after the dinner.

(Top left) : President T. S. Krishnamurthy postpones consideration of the amendments to the constitution moved by Mr. S. Natarajan.

(Bottom left) : The Collector of Customs, Mr. C. T. A. Pillai, who presided at the celebrations, addresses the gathering.





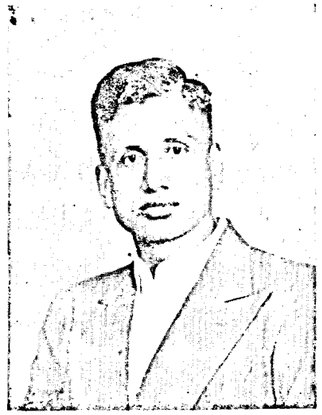


Madras Motor Parts Dealers' Association

NEW OFFICE BEARERS

MR. S. S. KALYANPUR
Vice President.

MR. B. I. CHANDHOK
Secretary.



MR. S. M. SUBRAMANIAM
Treasurer.

MADRAS LAMBRETTA CLUB

The following Office Bearers have been elected for the year 1961-1962 at the Fourth General Body Meeting of the Club held at the Club's premises recently.

Office Bearers:

Sri R. N. Pillai ... President
Sri S.S. Raghavan... Vice President
Sri A. Sagar ... Hon. Secretary
Sri U.N. Shiva Rao. Joint Secretary
Sri K. S. Mani ... Treasurer

Besides the above, ten Committee Members have been elected.

MADRAS MOTOR SPORTS CLUB

Sixth All India Race Meet

Date: 21st January 1962
Place: Sholavaram Air-Strip
Time: 8-30 A.M.

This year, with the close co-operation of the Clubs in South India, the entries that are being received are more than in the past. Some of the outstanding entries received so far include two racing cars, four motorcycles from Ceylon, a Riley Special and an Allard from Calcutta, a MGA/1960 Sports from Coorg and numerous competitors from Bangalore, Coimbatore, Poona and Bombay. Two Japanese Riders are also expected to compete on Honda Motorcycles.

Last year there were complaints of the poor visibility due to the dip in the Southern leg of the Track. This year this strip has been avoided and instead, the race track has been laid on the East, West and Northern legs, thus making it a "T" track. Spectator seats have all been arranged on the high mound near the intersection of the four tracks as a result of which most of the spectators will be able to see all the vehicles most of the time. The length of the Track this year will be two miles and racing will be anti-clockwise as against clockwise racing in the past

This year the organisation of the race is a joint effort of the Madras Motor Sports Club, Mylapore Round Table No. 3, and the All Nationals Association. A major portion of the proceeds will go towards local charities.

THE PREMIER AUTOMOBILES make all-round progress

Sri Lalchand Hirachand's comprehensive review

At the 17th Annual General Body Meeting of the Premier Automobiles Ltd. Bombay held on 22—12—61, its Chairman Sri Lalchand Hirachand made a comprehensive review of the achievements of the company and expressed confidence, hope and promise for the future.

He said that during the last year the Company's turnover increased to Rs 22,73,86,000/- as compared to the previous year's turnover of Rs. 20,94,87,000/-. 6913 cars and 6073 trucks were sold during the year.

P. A. L. Chairman Lalchand Hirachand

Net Profit Rs. 64.58 lacs

He added :

"The working of the Company for the year under report resulted in a profit of Rs. 60,59,495 after providing Rs. 56,44,279 for depreciation, Rs. 13,00,000 for development rebate and Rs. 55,00,000 for taxation. Adding to this, the balance of Rs. 3,21,332, being the amount of the previous year's "carry forward" (after adjusting the amount of dividend paid on forfeited shares now annulled) and the net surplus of excess provisions, income and claims received in respect of previous years Rs. 77,292, the amount available for distribution comes to Rs. 64,58,11?. Out of this your Directors have made the following appropriations.

	Rs.
To contingency reserve	10,00,000
To Dividend on equity shares at Rs. 9/- per share (subject to tax)	49,82,540
Balance to be carried forward	4,75,579

This year's turnover shows an increase of Rs. 1,78,99,000 over previous year's. In the same way the current year's profit shows an increase of Rs. 18,40,655 over last year's. This has naturally enabled us to maintain the dividend on increased capital.

Manufacture of Components

The progress made in the manufacture of components of motor vehicles by the Company is briefly summarised as follows :—

Axles & Transmissions

The Fiat transmission including gears is being manufactured in the factory. The manufacture of axles for the Fiat car is also satisfactorily progressing. The machining of the items like Brake Drums, Hubs, Ring Gears, Pinion and Axle Shaft has been completed and the assembly of the axles has already commenced. In a short time they will be used on the vehicles. The progress on the manufacture of front and rear axles for trucks has been steady.

D. L. F. Loan

As stated in the Directors' Report, an agreement in connection with the loan of 7,200,000 dollars from the Development Loan Fund of the U.S.A. has been executed. The aforesaid Agreement was signed on the 21st August 1961 in New Delhi by Mr. John Kenneth Galbraith, U. S. Ambassador on behalf of the U. S. Government and by me on behalf of the Company. A small ceremony was held in the U. S. Embassy in New Delhi on that day which was attended by several officials of the Indian Government and senior officers of the Premier Automobiles Ltd.

While signing the Agreement, Mr. John Galbraith said that this was the first Agreement he had signed for the private sector, since he became Ambassador and further observed:—

"There is nothing that is going to be more needed in the course of the Third Five-Year Plan than improved transportation, including improved road transportation. You (Premier Automobiles) are playing a very important and critical role in the provision of facilities necessary for this purpose. We have very high confidence in Premier Automobiles and it is our conviction that you will continue to do a very good job, that you will produce good automobiles, get them out in time and for a low price. This I am happy to note, is your intention and I wish you good luck."

While thanking the D.L.F. for this assistance I made a reply suited to the occasion as follows :—

"The initial success has been there. We have made considerable progress during the first two Plans, and it is our keen desire that the work should be carried on with greater enthusiasm, so that progress towards the objective for which the Government of India are working and for which people in Commerce and Industry are co-operating, may be accelerated. We greatly appreciate the assistance that we are getting from the American Government in the form of this loan. It is particularly a happy augury that, direct help is being given to the private sector. In this country, the private sector is playing a very important role in economic development, and I am sure that this assistance will help us to rebuild our nation for the betterment of all. The D. L. F. loan to Premier Automobiles will finance foreign exchange costs of importing machinery to produce components for Dodge and Fargo trucks and Fiat cars, and to modernise and expand the capacity of other portions of the company's factory. The expansion project made possible by the loan, is expected to enable India to save more than 2 million dollars per year in foreign exchange, now spent in importing sheet metal components. Premier's output will be increased from 12,000 trucks and cars per year to 21,000 units."

Foreign exchange shortage curtails expansion

The subject of expansion has been engaging the attention of the Government of India for some time. Subsequent to the meeting held by the Minister for Industries in January 1961 in Delhi, acute shortage of foreign exchange has developed and the Government have had to reassess the position. The thinking that was indicated in the meeting held in January was that so far as commercial vehicles were concerned each commercial vehicle manufacturer could increase the production to such capacity which he thought the market would accept. Freedom with regard to models and loading capacity was also given to the manufacturer. While the latter factors have not changed, the Government find it necessary to restrict the expansion in production capacity as there is not enough foreign exchange to meet the requirements of the manufacturers. Your company have been allowed to expand the production of commercial vehicles to 7500 on the basis of single shift working. We are also offered foreign exchange for the manufacture of the Meadows diesel engine. The total allocation therefore is as follows :—

(1) 7. 2 million dollars for the sheet metal equipment, expansion of Tool Room and removing of certain bottlenecks in the present capacity.

(2) Additional 3 million dollars

Further D. L. F. Loan for Dies

We are awaiting sanction for our application for a further loan of 3,000,000 dollars made to the D.L.F. for the purchase of dies for the Sheet Metal components for the Fiat cars.

Guaranteed by Bank of Baroda

I place on record our thanks to the Bank of Baroda Ltd. for giving guarantee in favour of the D. L. F. on the 26th September 1961, in respect of the loan of $7,200,000. The Bank of Baroda has also been good enough to agree to give the guarantee for the additional loan of 2,000,000 dollars.

for obtaining dies for the sheet metal parts particularly of the Fiat car.

It is estimated that the machinery acquired with this money will enable us to increase our production of Fiat cars to 9000 per year and of commercial vehicles to 9000 per year in two shifts.

In addition to the above, we will be allowed :—

a) Foreign exchange to the extent of 5 crores of rupees and

b) Additional 1.95 crores of rupees for purchasing machinery and equipment for forgings and castings.

For these two items negotiations will have to be made with the Agency for International Development, U. S. A. for a loan agreement. This money will be spent entirely in the United States of America.

c) In addition one crore of rupees will be given in foreign exchange from soft currency area and particularly from U. K.

It is expected that with the utilisation of this foreign exchange our capacity to produce commercial vehicles will increase to 7500 units on one shift basis of 15,000 vehicles on two shift basis.

As regards the expansion of car production the matter is still under Government's consideration and no decision has yet been taken.

Manufacture of Economy Car: Need for Rational Approach

In my last year's speech I had pointed out that it was not in the interest of the country for the public sector to take up the manufacture of an "economy car." Several representations from responsible quarters have since been made urging the Government not to create new productive capacity either in the private or public sector unless it was in the general interest of the national economy. The Jha Committee had already made its recommendations on similar lines against the introduction of an economy car at this stage. The Development Council for Automobiles Ancillary Industries and Transport Vehicles did not favour any allocation of foreign exchange being made for the production of a new car unless the priority claims of the existing Automobile manufacturers were fully met. The economy car is almost similar to the models currently produced. To profess, therefore, that such a model can be produced at a substantially lower price would be misleading. Our economy is based on high costs due to lower volume, less efficiency of labour, high prices of materials which have to be imported from abroad and the high taxation on local products. Unless therefore, the whole system is changed it will only be a miracle if costs could be brought down as steeply as expected. It would be useful if the Government paused a while and considered how the foreign automobile concerns declined to undertake the manufacture of automobiles on the ground of uneconomical production and therefore decided to close down their shops which were giving handsome profits. They had the experience, the know-how and all the resources ; so their decision to close down becomes significant in the context of the optimistic expectations of such low costs of the economy car. The recommendations of the French manufacturers are full of "ifs" and "buts". I would, therefore, appeal to the Minister of Industry to weigh the pros and cons of the problem more rationally before taking decision in the matter.

Effect of Hire Purchase Bill and heavy taxes on Sales

In the year 1961, the sales of vehicles have been very much similar to the sales in 1960. In the commercial vehicles however, there has been a little setback in the demand. This is partly due to the proposed legislation on Hire Purchase. Under this legislation the present right of the financiers to take possession of the product, if stipulated instalments are not paid, has been subjected to considerable restrictions. This has created a scare and the Banks as well as financing organisations have restricted their financing operations. As is well known, the commercial vehicles are primarily sold on Hire Purchase basis. If therefore, Hire Purchase operations are restricted, it has its effect on the demand for commercial vehicles. Secondly, the heavy taxation, particularly the heavy excise duties that were levied last year, is showing its effect gradually. The tight money market also has contributed to the fall in demand. The big waiting lists have shrunk and the commercial vehicles are now available practically on demand, even in the case of popular makes. How long this situation will continue, it is difficult to say. Let us hope that with the rising tempo of production in the Third Five Year Plan, the need for transport facilities grows rapidly and in consequence the demand for commercial vehicles also goes up.

Increased production of Commercial Vehicles

The Third Five Year Plan envisages an increase in vehicle production to the extent of doubling the present capacity. Under the Second Five Year Plan, the automobile production target was established at 60,000 units. For one reason or the other, this could not be reached and the maximum production came to 52,000 vehicles. In the Third Five Year Plan the target is fixed at 1,00,000 vehicles and the Government have already started taking steps to enable the manufacturers to expand their production. Hitherto, the Government have only considered the expansion of commercial vehicles, while the expansion of cars is still under consideration. I hope that expansion of the cars programme also will be given effect to before long. It is expected that more than 45 crores of rupees will be spent for the expansion programmes during the Third Five Year Plan.

Labour Relations

For the purpose of improving our relations with labour, we have entered into two Agreements with the Premier Automobile Employees' Union. By one Agreement, wage structure was revised, which is expected to give the workmen an annual additional income of nine lakhs of rupees. Under this Agreement, it can be safely said that we offer the best terms in the Automobile Industry.

Rs. 23 lakhs bonus for employees offered

The second Agreement covers the question of Bonus for the financial year 1959-60. The total amount approximating to Rs. 23 lakhs would be distributed as Bonus to all our employees. The share of the workmen, under this Agreement, whose earnings are below Rs. 500/- per month, comes to nearly Rs. 21 lakhs. All these terms were offered to Engineering Mazdoor Sabha, who have rejected them, if I may so, very unwisely.

Wages reclassification

The subject of wages reclassification etc. was referred to a Conciliation Board, of which the late Justice Bavdekar was the Chairman. The Court held elaborate deliberations and I understand, were about to sign the report. Unfortunately, the sudden death of Justice Bavdekar left the work incomplete. The Government have now appointed Shri Jeejibhoy to be the Chairman of this Board and it is hoped that the Board will soon conclude their deliberations and submit their report to the Government.

Research

While we are making progress with regard to the manufacture of parts and components, we are also making experiments and research with regard to design and other engineering problems. It was observed that some of our commercial vehicles have shown certain defects in the special conditions existing in this country. Our staff have redesigned some of the parts which will make the commercial vehicles more popular. A constant effort is being made to improve the methods of production and also improve the design, to make vehicles more popular.

Manufacture of the Meadows Engine

In last year's speech I had mentioned that as a result of the

Government's policy with regard to automobile manufacture, which was announced last year, the company will have the right to manufacture the Meadows engine. The Agreement with Automobile Products of India Ltd. for the taking over of the manufacture of Meadows engines by the Company was executed on 29th April 1961. In pursuance of this Agreement out of the sum of Rs. 24 lacs, the Company has paid Rs. 25 lacs to API in part consideration of the API having negotiated with the Government of India and agreed to cancellation of the Licence dated the 9th December 1955 issued to them for the manufacture of Meadows Engine and of API having negotiated with Meadows for the termination by mutual consent of the licence granted by Meadows to API under an Agreement dated the 16th March 1956. The balance of Rs. 9 lacs is payable in two instalments of Rs. 3 lacs and Rs. 6 lacs at the expiration of 12 months and 24 months respectively from the date of the Agreement.

The production of Meadows Engines has begun but it will take some time more before we can attain the full production as we have yet to import a number of machine tools required for the purpose.

In consequence of the transfer of diesel engine licence in favour of Premier, we have negotiated a fresh agreement with Henry Meadows Ltd. whereby Premier have obtained slightly favourable terms particularly regarding payment of royalty which has been substantially reduced.

Finance for Sheet Metal Project

As stated in the Directors' Report the Company had made an application for the issue of further equity capital of the value of Rs. 2 crores in shares of Rs. 100/- each, to meet the rupee expenditure that will be needed for the purchase of land, building etc. in connection with our sheet metal project. In addition a balance of Rs. 40,40,000 remained to be issued out of capital sanctioned by an earlier order of the Controller of Capital Issues.

The Controller of Capital Issues has now accorded his sanction for the issue by the Company of further 2,40,400 equity shares of Rs. 100/- each for cash at a premium of Rs. 10/- per share.

Factory sited at Kalyan

As stated in the Directors' Report the Company has selected a suitable land admeasuring about 300 acres on the Kalyan-Shill Road, near Kalyan for the new factory site. An Agreement with the Government of Maharashtra was executed on the 12th December 1961 in respect of the acquisition of this land. We expect to obtain actual possession of the land in a short time.

The construction work of the factory building at Kalyan has been entrusted to Messrs Hindustan Construction Co. Ltd. the well-known and reputed firm of construction contractors in the country.

Agreement with Chrysler

The existing Agreement of the Company with Chrysler Corporation had to be revised to bring it in conformity with the present day conditions. The modified Agreement has received the approval of the Government of India and will be valid upto 31st December 1966.

Under the provisions of this Agreement the Company has to pay to Chrysler Corporation in consideration of the manufacturing assistance and other benefits granted by the Corporation to the Company the following fee:

(1) when the total amount paid to Chrysler for a vehicle or components is more than 50% of the Chrysler ex-factory dealer net price: 1% of the value of that portion of complete vehicle not purchased from Chrysler.

(2) when the total amount paid to Chrysler as aforesaid is less than 50% of the Chrysler ex-factory dealer net price: 1½% of the value of that portion of complete vehicle not purchased from Chrysler.

The above scale of fee is applicable upto the production figure of 15,000 vehicles per year and thereafter the fee will be open to further negotiation between the parties.

Fiat Agreement Renewed

I am glad to inform you that the agreement with Fiat S. P. A. which was valid upto 12th September 1961 has been renewed for a further period of five years from 1st July 1961 and it has also received the approval of the Govt. of India.

Under the new agreement we have to pay to Fiat in addition to the payment for technical know-how etc. a fee of 2½% on £300 (being the agreed value of a CKD set exfactory) on each unit manufactured and sold by the Company upto 7,000 units manufactured per year and this fee will be reduced to 1.5% on each unit manufactured and sold by the Company beyond 7,000 units every year.

Out of 1,60,000 debentures issued in the year 1958, 1,57,462 debentures have been converted into 'A' Ordy. shares as on 8th December 1961, leaving a balance of 2538 still outstanding. By a special resolution passed in the meeting of the debenture-holders held on 2nd June 1961 the debenture-holders have accepted bank guarantee as security in place of lien which the debentures had on the fixed assets of the Company.

Production figures

For your information I may give the production figures for the five months ending on the 30th November 1961, and they are as follows:—

The Company produced 3014 cars and 1920 trucks and sold spare parts of the value of Rs. 67,06,938 during the five months ended on the 30th November 1961 as against 2730 cars and 2525 trucks and spare parts of the value of Rs. 64,01,443 sold in the corresponding period of the previous year.

Rs. 7 lakhs Damage by Fire

A fire broke out in our Factory on the night of 21st May 1961, which completely destroyed the Trim Application Dept., Trim Store and the Assembly Plant Office. As this day happened to be a weekly holiday for our workmen, there was no loss or injury to human life; the damage was confined to the materials of the approximate value of seven lacs of rupees. This damage was fully covered by insurance.

The business of the Premier Auto Electric Ltd. a subsidiary, was satisfactory. This Company took up the distributorship of more indigenous products, namely, automobile dash board instruments in Northern and Western India and Dagenite batteries in the State of Maharashtra and West Bengal.

The other subsidiary Company—the India Steering Gears Ltd. could not start business this year also due to non-availability of a licence.

The financial statements of both the companies have been published along with the financial statement of your Company.

The position regarding taxation is as follows:—

The income-tax assessments of the Company are completed upto the end of the financial year 30th June 1955.

The assessments of the Company as agents of Chrysler Corporation have also been completed upto 30th June 1960. The Company's application to the Tribunal for referring our case to the High Court is still pending.

The assessments of the Company as agents of Fiat Corporation have been completed upto the financial year 30th June 1960.

Donations

In addition to the donation of Rs. 25,000/- to the Poona Flood Relief Fund and Rs. 10,000/- for relief work at Poona mentioned in the Directors' Report, the Company has sanctioned a donation of Rs. 90,000/- to the Election Fund of the Congress Party and Rs. 60,000/- to the Election Fund of the Swatantra Party.

Welfare Activities

I shall now deal with some of the welfare activities in our works.

The Company has always been encouraging activities in the realm of sports. Members of our staff participated in the Times of India Cricket Shield, Football, Hockey, Hu-tu-tu, and Badminton tournaments in the city.

Adult education classes in Kannada are held in the colony under the auspices of the Bombay City Social Education Committee for such of the employees who desire to take advantage of the same.

There is also a Bala Mandir Primary School (run with the aid of the management), having over 300 children. The Workers' Education Classes conducted by workers-teachers trained under the Government of India Workers' Education Scheme, have been recently started and about 35 worker students attend this class.

I extend an invitation to all the shareholders to visit our factory this year also. To facilitate the visit, Saturday, 13th January 1962 has been selected and those of you who would wish to visit the factory are requested to register their names at the Head Office of the Company so that necessary transport can be arranged.

Before concluding, I take this opportunity to offer thanks to the staff and workers for their co-operation and the good work put in by them during the year under review."

GABRIEL INDIA MANUFACTURES SHOCK ABSORBERS

Gabriel India's plant at Mulund was recently opened by Mr. Y. B. Chavan, Chief Minister of Maharashtra. The plant will initially make 120,000 automobile shock absorbers a year. Gabriel India is jointly sponsored by the Gabriel Company of Cleveland, Ohio, U. S. A., the world's largest independent manufacturer of automobile shock absorbers, and Anand Automobiles of Bombay.

Indo-American Collaboration

The Chief Minister described the venture as a fine example of Indo-American collaboration in the sphere of industrial enterprise. Mr. Chavan said that there was ample scope in India for the growth of ancillary industries. The pace of industrial progress, he pointed out, was largely dependent on the development of subsidiary and ancillary units.

Mr. D. C. Anand, the Managing Director of Gabriel India Ltd., said that Gabriel India's shock absorbers would make a significant contribution towards saving foreign exchange. He stated that his company would supply its shock absorbers as original equipment to several Indian automobile manufacturers like Mahindra and Mahindra, and Premier Automobiles of Bombay, and Ashok Leyland of Madras. Gabriel India in its turn, depended on its own net-work of ancillary suppliers.

Phased Production

Mr. Anand said that the plant was only in the first phase of its manufacturing programme. The second phase, which had already been worked out, would involve an additional capital outlay. The third phase, to be completed in three and a half years, would effect a further saving in foreign exchange.

Mr. John Briggs, the President of the Gabriel Company of U. S. A. emphasised the importance of the concept of partnership of businessmen of different nations in new ventures. Mr. Frank S. Wilson, the Chairman of Gabriel India Limited, said that it was a privilege to locate the plant in the rapidly growing and progressive State of Maharashtra.

Foreign Exchange Savings

The first prototype shock absorber came off the manufacturing line on the 3rd August, 1961, and within 30 days the plant was operating at its full licensed capacity of 400 shock absorbers a day on single shift basis. Even with an indigenous content of 40%, this new unit would make possible a saving of Rs. 10 lakhs in foreign exchange, rising ultimately to Rs. 50 lakhs.

Mr. Naval Mody, Director, Gabriel India Limited, proposed a vote of thanks.

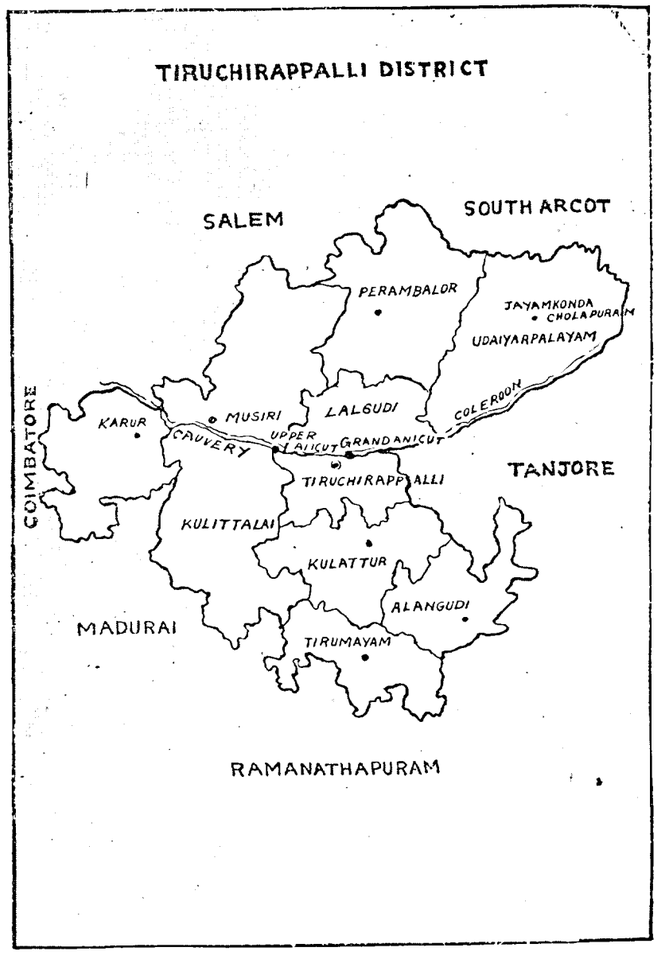
Tiruchirapalli district forms part of the granary of South India. This is one of the few districts in Tamilnad which presents an evergreen and cool appearance, year in and year out. The river Cauvery flows through this district.

Historically Tiruchi district has been of great importance. It formed part of Chola Kingdom with Tiruchirapalli as the seat of the great Cholas. In fact it has been of no little importance.

Even along the shores of Cauvery, many temples are found, which were built centuries ago. The temples at Srirangam, Tirvanaikovil at Gangaikonda Cholapuram, the Rock Fort in Tiruchirapalli with the temple at the top, the historic fort of Tirumayam are some of the places of interest which should not be missed by the tourists.

Triuchi district is bound on the north by the Salem and South Arcot districts, on the east by Tanjore district, on the south by Madurai, and Ramanathapuram districts and on the west by Coimbatore district. The former state of Pudukkottai was merged in the district in 1948.

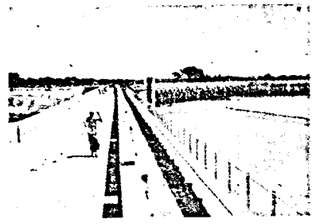
Tiruchi is one of the foremost educational centres in South India. The St. Joseph's College which is more than a century old and the National College have a prominent place in the history of education in South India. Industries also thrive in this district. Weaving is the chief industry. Kulithalai, Waraiyur are important towns producing handloom cloth. Cloth of superior quality is produced at Manamedu Thuraiyur, and Woraiyur for export. Fine varieties of sarees and dhoties are produced in Kulitalai, Karur and Tiruchirapalli. Silk weaving is carried on by the members of the Saurashtra community in Tiruchirapalli. Cotton ginning factories are functioning at Karur, Perambalur and Thuraiyur.



Paradise for Tourists

The Grand Anicut

The historic Grand Anicut dating back to the second century, is visited by a large number of tourists and



The Grand Anicut

engineers alike. To make the place more impressive it was electrified, and gardens and parks were laid out two years ago.

This anicut was built by Raja Karikala Chola. The anicut formerly consisted of a solid mass of rough stone in clay 1080 feet long. 40 to 60 feet in width, and 15 to 18 feet high, stretching across the outlet in a serpentine form. The "old dam" effectively withstood the floods of 1600 years by the mere inertia of its materials.

It is on record that thousands of Ceylonese labourers were employed for the work, after the conquest of Ceylon by the Cholas. This was the first step in the taming of the Cauvery and bringing in irrigational facilities to a large extent in the Tanjore delta. In addition to the construction of the anicut the Chola rulers seem to have constructed flood embankments to the Cauvery.

In 1804 Captain Coldwell repaired the Grand Anicut and provided dam stones on the crest and at the same time raised the river embankments above the Grand Anicut, thus forcing more water into the Cauvery. This Anicut stands as a fitting tribute to the master builders of Tamilnad.

Tiruchi Rock Fort

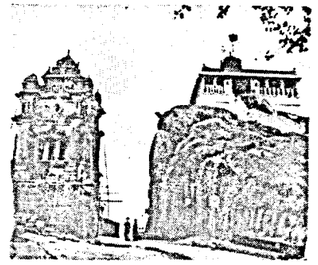
Tiruchi's Rock Fort (273 feet high) in the heart of the city, played a historic part in the Carnatic wars in which the British and the French fought for supremacy and it was on the Rock that the French dreams of founding their mighty empire in India foundered.

The Rock fort is very ancient and the temples there have interesting associations.

The main temple on the Rock is dedicated to Siva who is called Thayumanavar or Mathru Bhudeswarar. The name implies that he, who is a father deigned to appear even as a mother, because he attended on a woman at the time of her confinement, taking the place of her mother, who could not come to her, due to floods in the Cauvery.

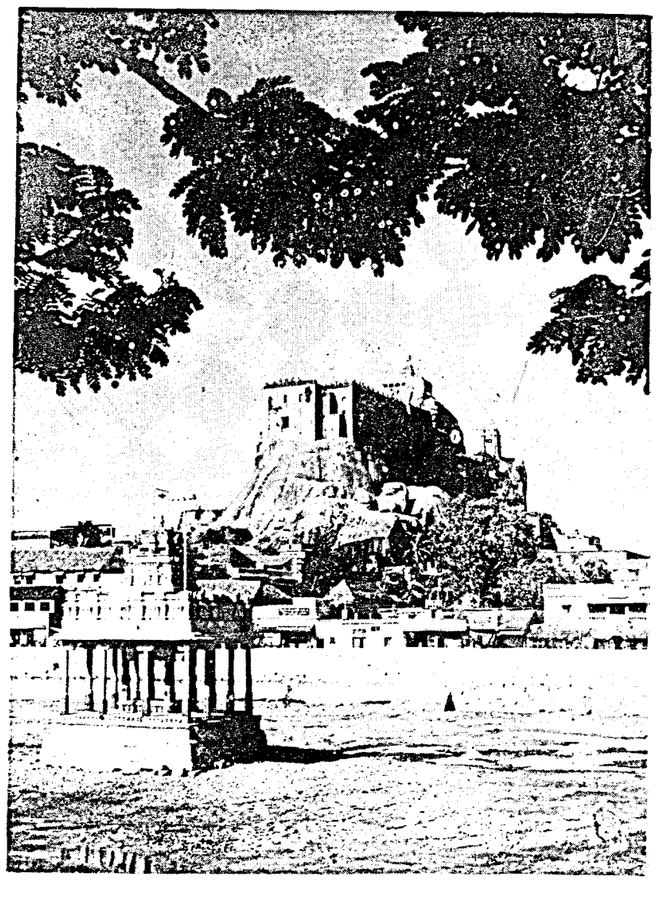
It is believed that the greater part of the town and the fort were built by the Nayaks of Madurai who were in possession of the place from the middle of the sixteenth century.

In its early days Tiruchi Fort was considered almost impregnable. In 1743, the Nizam's troops attacked

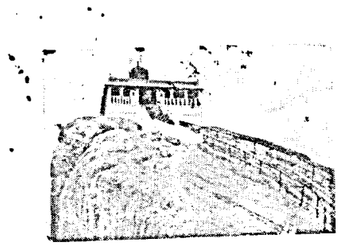


The Clock Tower

and captured the fort, driving away the Maharattas who held sway over the place for a brief period. From then it was ruled by Mohomedans, till it passed into the hands of the English.

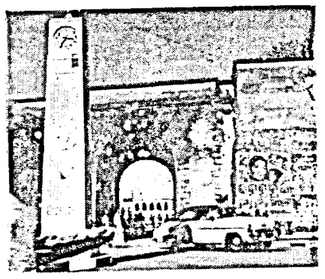


Rock Fort and Teppakulam



Uchi Pillaiar Koil

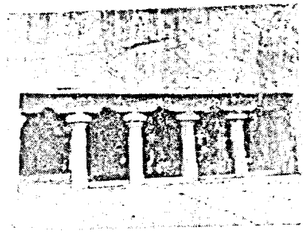
During the Carnatic wars, this fort played an important part. It was besieged many times. Chanda Sahib and Mohamed Ali became pawns in the Anglo-French power politics. Mohamed Ali took refuge at Tiruchi and a French force was sent to reduce the town. The English sent help to Mohamed Ali at Tiruchi. The success of Clive at



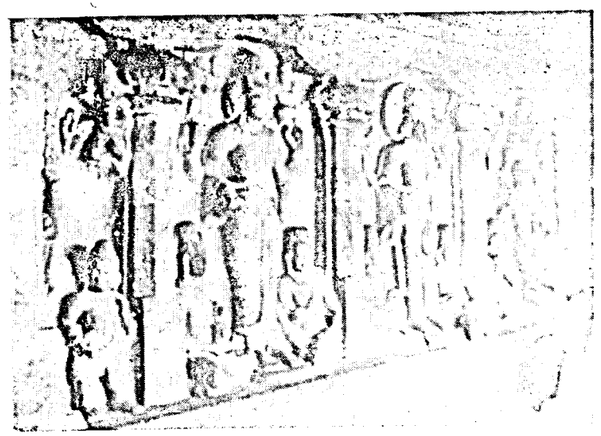
The Main Gate

Arcot unnerved the French forces besieging Tiruchi and they took refuge in the island of Srirangam. At the instance of Clive the English besieged the island and the French were forced to surrender. Chanda Sahib surrendered and was beheaded.

After Tiruchi came under the British, it became a military centre



Pallava Cave in the Fort



Sculptures in another Pallava Cave

of importance and remained so till the beginning of the twentieth century.

The rock has the appearance of an enormous bull lying down with head lifted up and it is sometimes called Virushabachala. A flight of 417 steps on the southern side leads to the top. A shrine dedicated to Ganesha is believed to have been built by Karicala Chola. This Uchi Pillaiar Koil crowns the summit of the hill. From the corridor around it, a grand view of the city and surroundings can be had.

There are two cave temples cut into the rock, one beside the passage leading the Uchi Pillaiarkoil and the other at the north western end of the street encircling the hill. These are the works of Pallava sculptors and were built by King Mahendravarman during the sixth century.

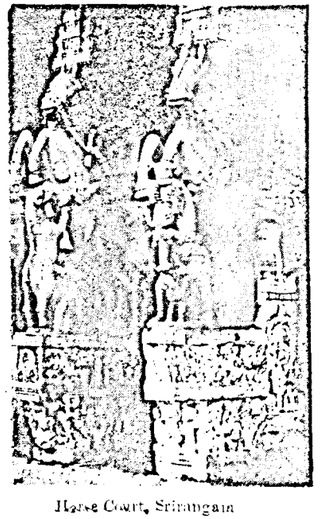
In the Nadir Shah mosque, west of the town, lie buried the Nawab Mohamed Ali and the headless corpse of his rival Chanda Sahib. This mosque is an important moslem place of pilgrimage for it contains the tomb of the famous saint, Sultan Saiyad Babayya Nadar Shah.

Srirangam

Situated three miles from Tiruchirappalli, Srirangam temple is dedicated to Lord Ranganatha. The temple is the largest in South India, possessing seven spacious enclosures round 21 impressive towers of varying heights.

In this temple the Lord is represented as reclining on the folds of a five-hooded serpent. The peculiar feature is that the Lord faces the south instead of the east, as is common in most shrines in India.

Sri Ranganathar occupies a very unique position even among Gods in temples. He was the god whom the Kings of the Solar race worshipped from the days of Manu. He is the



Horse Court, Srirangam

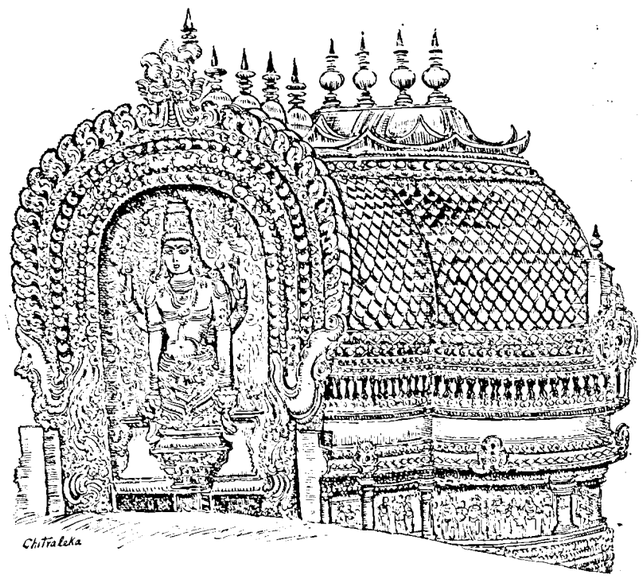
Perumal that Rama himself worshipped in the company of Sita. Sri Ranganathar is also known as Pathimar-padum — Perumal (the Perumal sung by all the ten Alwars), an honour which belongs to this Lord alone.

Very little is known for certain about the history of the temple. A local legend states that the image of the God was placed in the temple by Vibishana, brother of Ravana. Another legend says that the God was enamoured of the daughter of a moslem King of Delhi, appeared to her in her dreams and eventually brought her to his temple. A room in the fifth enclosure, ornamented in the Muhammedan style is said to contain her image which is called Thullukka Nachiyar or moslem Princess and every morning the idol is offered bread, green grain, butter, sugar and milk, which are considered to be the ingredients of a Mohomedan meal.

The city encroaches upon the temple and its last two outer enclosures are intercepted by a number of houses and bazars.

The fifth enclosure contains numerous mantapams and shrines. The white tower seen on the eastern side of this enclosure is the tallest and rises in nine diminishing tiers upto a height of 165 feet. Rangavilasa Mandapam on the southern side is also noteworthy for its architectural beauty.

The shrine dedicated to Venugopala (Krishna) and the Seshagiri



Ranga Vimanam, Srirangam

Rayar mandapam in front of the thousand pillared hall in this enclosure, are marvellous for their sculptures of beautiful damsels and rearing horses.

The sanctum-sanctorum within the first enclosure has had a gold plated. Vimana in the shape of Omkara. The dharsan of the Lord can be had from the Santhana mandapam (Hall of sandalwood).

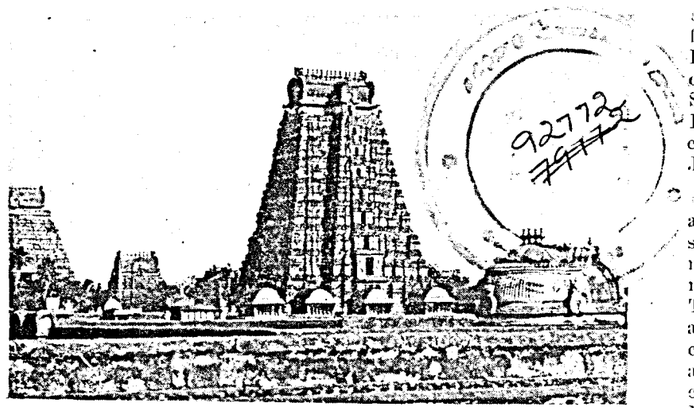
It is said the Chola King Dharmavaraman constructed the shrine as commanded by the Lord in his dream.

The sanctity and high esteem with which this shrine was held drew the attention of Edward VII, then Prince of Wales, during his visit to this country. He presented a golden plate which is kept in the temple treasury.

The temple jewels are more valuable than almost any others in South India.

There is a tradition that the celebrated Orloff diamond which figured as the chief ornament in the Imperial sceptre of the Czar was once one of the eyes of the idol at Srirangam and was stolen by a French deserter in the eighteenth century (Tours in India by Mr. J. D. Rose).

On 22nd March 1960, there was a fire accident inside the sanctum sanctorum but Ranganatha came out, not only unscathed by that fire, but more fresh and beautiful than ever. The Lord of Beauty in whom our ancient sages had seen infinite charm, had His beauty smothered and concealed underneath repeated coats of Thaila (oil). Grand Mahasamprokshanam was performed recently.



Srirangam Temple Main Tower

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