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Journal



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Jan.—Feb. 1954



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In this Issue

- RAILWAY FREIGHTS
- PRESTRESSED CONCRETE
- ICMA ANNUAL SESSION

AND

OTHER USUAL FEATURES.

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Cover Photo

Dr. Rm. Alagappa Chettiar distributing prizes on Staff Day.

RAILWAY FREIGHTS



A brief mention is made elsewhere in this issue of a resolution about railway freights moved at the Indian Chemical Manufacturers Association's annual session at Calcutta by Mr. R. Chakravarthy, our Resident Representative, in New Delhi.

In moving the resolution, Mr. Chakravarthy pointed out that the railways were part and parcel of the life and economy of the country, and that the Railway administration had an important role to fulfil in the successful implementation of the Five-Year Plan. The Plan contained several recommendations for the reduction of freights, and the Railway administration, he contended, had not carried out these recommendations. In other countries, he continued, the Railways were not considered as a profit-making agency only; they offered facilities and amenities for the promotion of trade and commerce and the progress of industry.

The present rating policy of the Railways still contained vestiges of the past practices of a by-gone era when the country was under foreign domination, Mr. Chakravarthy declared. Looking with disfavour on all applications for concessional freights had possibly become a force of habit with Railway officials. The Railway Board had set replies to all requests for concessions. Increase in operational costs, discrimination between one carrier and another and the ability of the industry to pass on the freight to the consumer, were the stock points stressed in replies from the Board.

The privileged position of Railway labour which was out of all proportion to labour employed elsewhere, was probably responsible for the high operational costs of Railways, Mr. Chakravarthy said. Efficiency of the service would come only with higher productivity, and it was not fair, he said, to penalise the carriers of goods for maintaining a small section of the community satisfied. He also cited the specific example of a three-fold increase in the freight of the salt used by MCIC, although the Company had increased the volume of traffic and had assured regular loading between fixed points, thereby contributing to a decrease in operational costs.

As for discrimination between carrier and carrier, Mr. Chakravarthy said that those whose scale of operations was larger had necessarily to be shown larger concessions in freights.

As regards the ability of the industry to pass on the increased freights to consumers, the speaker submitted that the basic chemical industry had a great responsibility to other industries for providing them with cheap raw materials; so if it added the increased freights to the prices it had originally fixed, the prices of several consumer goods would automatically go up.

Concluding, Mr. Chakravarthy declared that the recommendations of the Tariff Commission on the question of freights had not received adequate consideration from Government.



In the last two decades, considerable progress has been made both in the knowledge and application of prestressed concrete and soil mechanics. The principles of soil mechanics are being very widely applied in all major constructions in the world. In several places, earth dams are being constructed in preference to masonry or concrete dams. So also, prestressed concrete may soon supersede reinforced concrete to a large extent. We live in days of prefabricated structures, so prestressed concrete structures are likely to be preferred to other types. Two of the advantages of prestressed are lightness and ease of handling. Further, when manufactured on a large-scale, prestressed concrete would compare favourably in the matter of costs and performance.

ORIGIN

The idea of prestressing stemmed from studies undertaken to prevent crack formations in reinforced concrete, and to make a more efficient use of both steel and concrete. The knowledge gained in the process has largely

been responsible for the "invention" of prestressed concrete.

The first patent on prestressed concrete was taken as far back as 1886 by P. H. Jackson; slightly latter-day patentees were Dornbier, Lund, and Lakes. All their work suffered from certain basic disadvantages. For one thing, the physical properties of concrete such as shrinkage, plastic flow, etc., were unknown in those days. The ultimate compressive strength attainable under field conditions was less than 3,000 p. s. i.

For another, the tensile stresses applied in steel in the early attempts at prestressing ranged from 8,500 to 12,000 p. s. i. These stresses got reduced considerably due to shrinkage and the plastic flow of concrete, after the release of the bars from external anchorages.

Other early exponents of prestressed concrete were M. Freyssinet of France, Dr. Magnel of Belgium and Dr. Hoyer of Australia, each advancing his own methods for prestressing.

* Being the summary of a talk given by Mr. K. R. Dorairajan, a student of the College of Engineering, Kakinada, and son of Mr. K. V. Ramachandran, Senior Chemist, M. C. I. C. to the S. O. T. on December 28, 1953.

NEED FOR PRESTRESSING

Up to the present day, steel construction, rather than reinforced concrete, has succeeded in holding the field in long-span structures. The chief reasons for the failure of reinforced concrete are:

1. The dead load of reinforced concrete structures increases approximately with the square of the length of the span. This causes a sharp drop in the economic efficiency of the structure when a certain length of span is exceeded. Designed for the same loads, the economic span limits for reinforced concrete structures are:

For simply supported beams . . . 80 ft.
Continuous beams . . . 160 ft.
Flat arch beam girders . . . 300 ft.

total compression attainable being equal to the area of the compression triangle (as in the stress diagram (Fig. 1.) multiplied by the width of the beam. The tensile area of the concrete below the neutral axis is ignored because of the low tensile strength of concrete. Hence only about one third of the concrete in a rectangular beam is effective in resisting the stresses.

The use of high tensile steel in reinforced concrete work is also limited because of the considerable elongation of steel under high tensile stresses. Also, with a view to preventing excessive cracking in the tension side of the concrete, the working stress in steel reinforcement has to be limited to a maximum of 20,000 p. s. i. though steel itself has an ultimate strength of

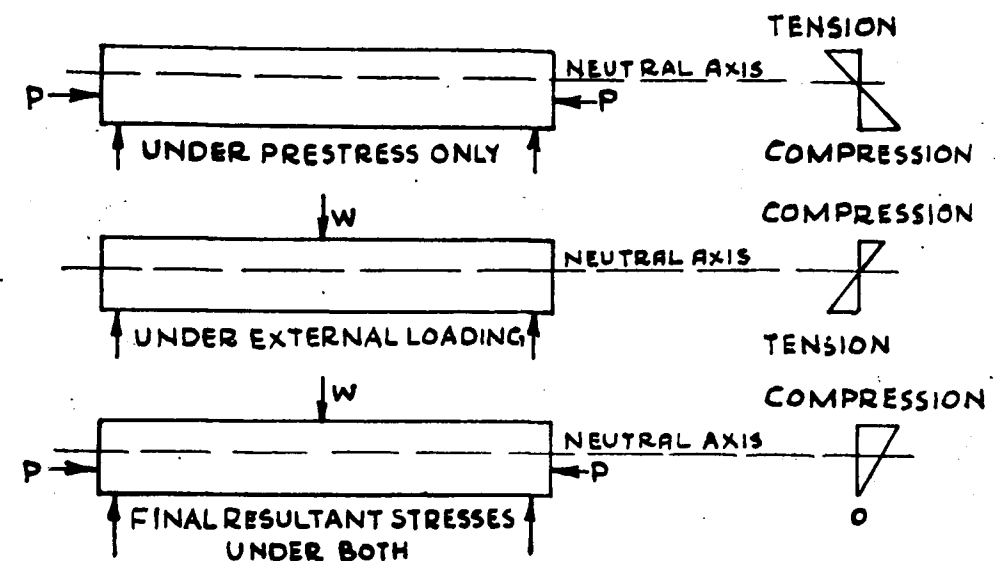


Fig. 1: Stress Distribution in a prestressed beam.
(P. Prestressing force; W. External loading.)

2. Steel and concrete cannot be used efficiently in reinforced concrete members subjected to bending, the 360,000 p. s. i. Consequently no economy can be attained in reinforced concrete.

3. One of the fundamental principles of the reinforced concrete theory is proper transmission of stresses from concrete to steel, so that steel may be considered as an incorporated part of the concrete section. Thus bond between the two materials is very essential, but in practice it has been observed that bond between the two is very ineffective when the bars are more than one inch in diameter or when high working stresses in steel are used. This inadequate bondage is all the more pronounced in the case of a large number of bars arranged in several layers.

In view of these considerations, steel structures have hitherto been preferred to reinforced concrete in long span constructions.

PRESTRESSING PRINCIPLE

The principle underlying prestressed concrete construction is to induce in a structure a state of stress opposite to that which will be existing under the final loading.

When loads are applied, the stress due to the loading will be superposed on the prestress, and thus a more economical stress distribution over the cross-section is obtained and the possibility of cracking in the tension-face of the member is avoided.

Let us assume that we have to construct a slab bridge of 66 feet span with a super load of 400 pounds per sq. ft. Consider a slab 32 inches thick which also weighs 400 pounds per sq. ft. The maximum bending moment at midspan, when freely

supported, is 52,27,200 inch-pounds per foot-width, and the resulting stress is 2,550 p. s. i. If the concrete were not reinforced, it should be capable of resisting this tensile stress. It will be obvious that no such stress can be resisted by concrete. Let us now assume that the slab is placed in a vessel containing an air pressure of 3000 p. s. i. Then the slab will be able to support its self-weight and also the super load. At mid-span, the total compressive stress in the top fibre will be 5,550 p. s. i. and the residual compressive stress in the bottom fibre 450 p. s. i.

The theory of prestressing can easily be illustrated by the following example.

Books side by side on a shelf have the shape of a beam. If we try to place this beam with only the ends resting on supports the beam will collapse, but if we compress the beam (of books) longitudinally and without eccentricity and support at the ends as before, not only will the shape of the beam be preserved, but the beam can also take some super-imposed loads.

Thus prestressing converts a concrete structure into a homogeneous one. Since steel is pre-tensioned, independent of the concrete, consequently serving to induce compressive stresses, the best high-strength steel and concrete of the best quality can be used with advantage in prestressed concrete work.

REQUIREMENTS

The concrete required is to be high-grade with a low water-cement ratio. Ultimate strength of the concrete should be of the order of 6,000

to 9,000 p. s. i. measured on six inch cubes. Allowing a factor of safety of 4, the working compressive stress will be 1,500 to 2,250 p. s. i.

The prestressing wires should be of cold drawn high-tensile steel with an ultimate strength of 150 tons p. s. i. and a yield point of 150,000 p. s. i. These wires are tensioned up to 120,000 p. s. i. initially. Final tension in the wires after all losses have occurred will be of the order of 100,000 p. s. i. Twelve-gauge wires are used in the Concrete-grip System, and wires of 5 mm. diameter are used in the Anchorage System.

PRESTRESSING METHODS

There are two principal methods of applying the prestress with an initial eccentric or axial compressive force. They are (1) The Concrete-grip System and (2) The End Anchorage-System.

In the Concrete-grip System, high tensile, cold-drawn steel wires are

into position. After the concrete hardens, the steel wires are cut off from the bulkheads. The wires then contract and increase in diameter and press against the surrounding concrete, thereby transmitting to the concrete the initial force in them as compression. This method is called the Concrete-grip System and is found to be very suitable for the manufacture of railway sleepers, piles, small joists, pipes and pre-cast elements for dwelling houses.

The End Anchorage System consists in post-tensioning the steel wires after the concrete hardens. The cable of wires in this case is enclosed inside a steel sheath or some form of wrapping like tarred paper. The steel sheath is placed inside the form work, and the concrete is poured. After the concrete gets hardened, tension is applied to the cable by means of jacks. The steel wires are finally anchored at the ends of the beam either by machined keys in "sandwich plates" (Belgian Method) or by mating conical concrete members

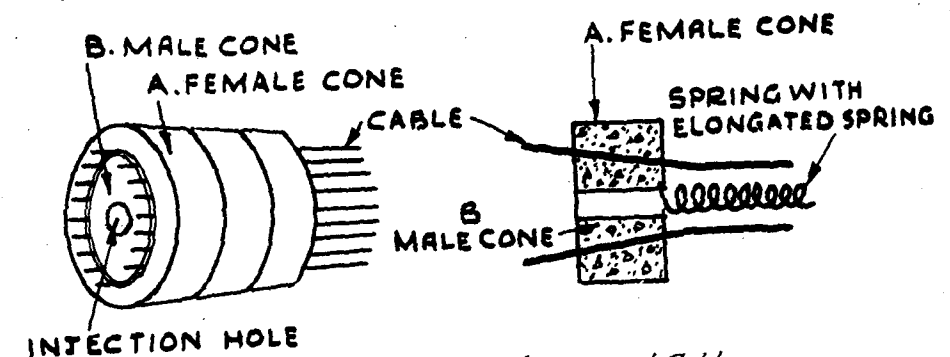


Fig. 2: Freyssinet Anchorage and Cable.

stretched between bulkheads to a pre-determined extent; the moulds are then placed surrounding these wires and concrete is poured and vibrated (French Method). The jacks are released. The anchorage blocks are either left as such at the ends of the beam or covered with concrete.

The Freyssinet Anchorage (Fig. 2) consists of a cylindrical concrete block 'A' with a conical hole in the centre. Into this can be fitted another conical concrete member 'B' with a central cylindrical hole. In between these two blocks the wires are passed and locked. Cement grout is injected into the core of the cable through the central hole in the male cone to prevent any corrosion of the steel wires.

Dr. Magnell's sandwich plate anchorage (Fig. 3.) consists of flat-cast steel plates bearing two grooves in the upper surface and two in the lower. Inside each groove formed between two plates two wires can be

passed and anchored by a machined key. The cast steel plates can be stacked one over the other, and are made to butt against a steel distributing plate with a rectangular hole through which the wires pass. The sandwich plates are locked together by bolts and cross-pieces. While passing the wires into the steel sheath, the wires are made to converge to a distance piece held in a bolted frame and taken out through the anchorage block at the other end. Finally cement grouting of the core of the cable is effected as in the Freyssinet method.

POST-TENSIONING OF CONCRETE TANKS

After the construction of the cylindrical concrete wall, a special type of wire-winding machine is suspended from a track placed on the top of the

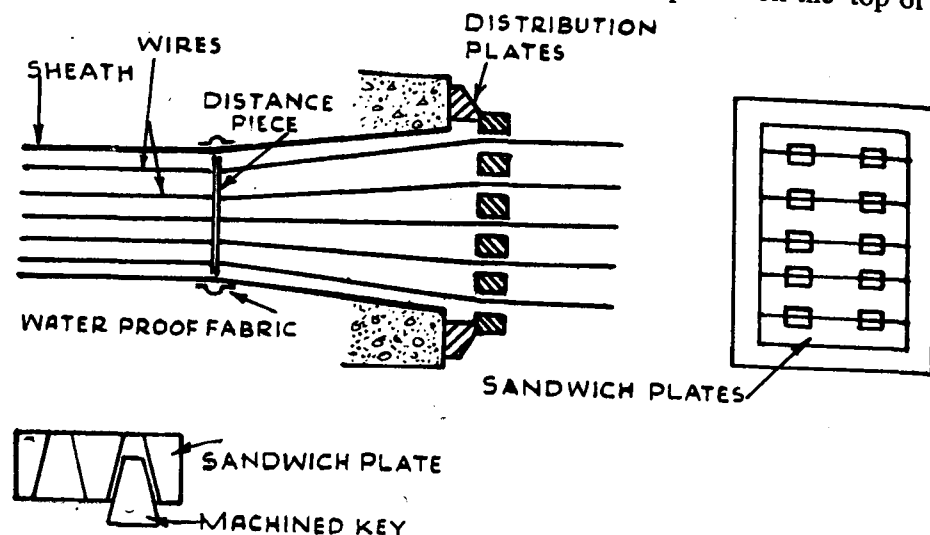


Fig. 3: Dr. Magnell's Anchorage System.

passed and anchored by a machined key. The cast steel plates can be stacked one over the other, and are made to butt against a steel distributing

wall. A platform carrying coils of high tensile wires circles round the outer surface of the wall. As it goes round the tank, wire is passed out through a

die and stretched automatically to 1,40,000 p. s. i. The platform is gradually raised to suit the desired spacing of the wires. Finally, a thin application of pneumatic mortar is given over the wires. The quantity of reinforcement steel is stated to be approximately 75 per cent of that necessary for a reinforced concrete tank of the same capacity.

ELECTRICAL PRESTRESSING

Prestressing has also been effected by applying electricity. The bars are threaded at the ends and placed in a bath of molten sulphur and then placed inside the form work. The concrete is poured and allowed to harden. The bars are then electrically heated for two minutes with a current of 400 amperes at 5 volts. The sulphur-coating over the bars melts and breaks the link between the concrete and the steel and allows the bars to elongate. The nuts at the ends are tightened and the bars hooked, so that they remain permanently stretched.

APPLICATIONS

Several structural members such as columns, valley beams, rafters and purlins, can be made of prestressed concrete. Railway sleepers of prestressed concrete are being made and employed in the advanced countries of the West. Prestressed concrete pipes are used for purposes of withstanding high pressures of fluids circulated

through them. Pipes of one foot diameter made of prestressed concrete are able to resist pressures up to 175 p. s. i. Prestressing is also being used with advantage in the construction of storage tanks for oil or water. The elimination of ring tension and shrinkage stresses throughout the walls of a cylindrical tank prevents the occurrence of even fine cracks, ensuring thereby perfect liquid tightness. Prestressed concrete slabs are being employed in runways for airfields, railway platforms, etc. To mention one example, the airfield in Paris is of prestressed concrete slabs, and was designed by M. Freyssinet.

CONCLUSION

There is considerable economy of materials in prestressed concrete construction. A prestressed beam, for instance, requires only about thirty per cent of the steel and about fifty per cent of the concrete required for a beam of reinforced concrete to resist the same bending moment. But it should be remembered that prestressed concrete constructions will call for special quality materials and for skilled labour and supervision, and would therefore be more expensive than reinforced concrete. However, if we consider the durability and elegance of prestressed concrete structures, the extra cost involved would be amply justified.

HOW WE DID IT...

1. Rectifier Formation 2. Electro-deposition

by S. RAMAMURTHY

ONE of our mercury arc rectifiers had to be opened out recently for the replacement of a broken anode insulator. After the replacement, the rectifier had to be 'formed' again. By 'formation' is meant the elimination of traces of moisture and occluded gases from the rectifier by working it with a low voltage, and progressively increasing the current till it reaches the rated value. The load is formed by a suitable resistor.

When the Rectifiers were first formed, prior to being commissioned in

July 1952, one of our two banks of electrolyzers—the Billiter cells—was because of power restriction not in operation. We therefore adapted one of the Billiter cells for the purpose of serving as a variable liquid resistance.

Now with full power available, a method had to be devised whereby the rectifier could be loaded artificially without production being affected. It was also necessary to arrange the connection of the artificial load with the minimum length of bus-bars.

An idea of how we did it can be had from Fig. 1. Two coils of $1\frac{1}{2}$ in. x $\frac{3}{8}$

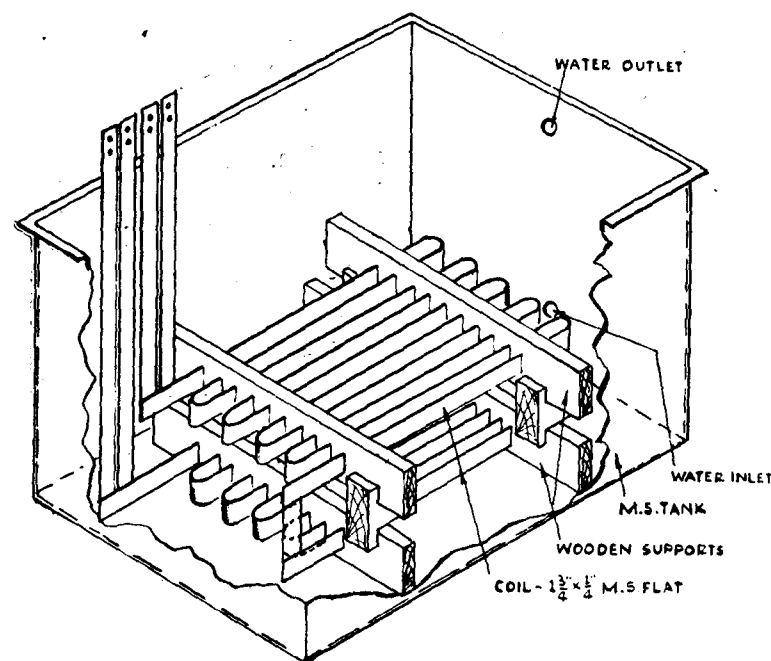


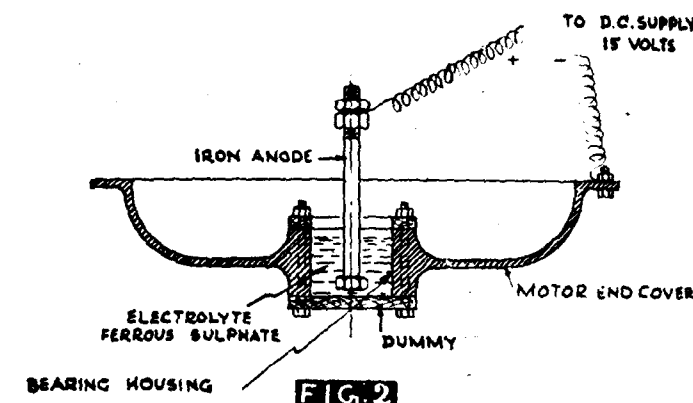
FIG. 1

Resistor in the formation of the rectifiers.

in. mild steel flat, each 28 feet long, were made in two layers, and welded one below the other, with connecting pieces. Wooden spacers were provided, and the whole assembly was put into a tank fitted with inlet and outlet connections for cooling water. The flat iron resistor was connected across the rectifier output terminals beyond the cathode circuit-breaker. Rubber hoses were used for the inlet and outlet connections of the cooling water to prevent the water lines from becoming energised. Water was passed in and out of the tank at the rate of about 800 gallons per hour, the outlet water being returned to our Boiler House. The resistor worked satisfactorily with a current of 4000 amperes passing through it. The temperature of the outlet water was about 56 deg. C. The arrangement was simple and compact and the formation of the rectifier could be completed easily.

A simple, but very useful, application of electro-deposition was recently made by us for building up the worn-out housings of ball and roller bearings. In old pumps, motors, etc., housings of ball bearings are apt to become loose, due to constant removal and refitting, vibration, etc. The method usually adopted for rebuilding the housings is to take a light cut on the lathe, then groove, spray with metal, and finally finish to size on the lathe. This method, though quite good, involves a number of operations, and requires

skilled labour for the lathe work and metal spraying. Electro-deposition of



Electro-deposition.

iron on the surface of the housing is simpler and has been found to give good results. The method employed by us for depositing iron on the bearing housing of a motor is as shown in Fig. 2. The electrolyte used was ferrous sulphate (concentration 275 grams per litre). Direct current was obtained from a battery-charger and a current of 4 to 6 amperes was found to be satisfactory. So far, plating up to $\frac{1}{32}$ -inch of thickness has been made. The deposit was very adherant, and quite tough for the purpose of keeping the bearing tight. By suitably adapting this method, worn-out shafts which require light addition of metal can also be built up. The method promises to be very useful in the maintenance of machinery.

I. C. M. A. ANNUAL SESSION

Inauguration by Mr. K. C. REDDY

“THE most urgent problem of the Industry is to consolidate itself by bringing its idle capacity into full production. As increase of production is the keynote of Government policy, the Chemical industry looks to Government for incentives that would help it,” declared Mr. Purushotamdas Popatlal in his presidential address to the thirteenth Annual General Session of the Indian Chemical Manufacturers Association held at the Great Eastern Hotel, Calcutta, on November 30, 1953.

Mr. K. C. Reddy, Union Production Minister, inaugurated the session.

Representatives from all over the country were present.

Mr. R. Natarajan, Secretary, and Mr. S. Ramaswami, Production Superintendent, represented MCIC at the meeting. Also present was Mr. R. Chakravarthy, our Resident Representative in New Delhi, on behalf of the Fertilisers and Chemicals (Travancore) Limited, Alwaye.

Continuing, Mr. Popatlal said: “Government patronage was, and still very largely, is necessary even in the most highly industrialised countries. The phenomenal progress of the chemical industry in the U. S.,

for example, in recent years would not have been possible but for major Government assistance in the form of accelerated tax amortizations, bulk purchase and resale of vital materials, direct loans, loan guarantees, commitments to purchase at specified floor prices and Government financing of part of the cost of exploration for minerals. Developments in the U. K. were equally generously assisted.” (Classic examples were the Dyestuffs (Import regulation) act in 1920 and the safeguarding of Industries Act in 1921.)

DEVELOPMENT COUNCIL

Welcoming the appointment of a Development Council for Heavy Chemicals, Mr. Popatlal said that it was gratifying to note that the Council had already begun its work. The wise counsels of such a representative body would be of great benefit to the acid and fertiliser industries, he added.

Referring to the transport needs of the Chemical industry, the speaker observed that high railway freights and low priority of movements had been long-standing grievances with the industry. Mr. Popatlal said that in the United Kingdom, for instance, the British Transport Commission laid

emphasis on service rather than on profit. “The young chemical industry has been the worst sufferer in this regard as its requirements of bulky raw materials from different sources are numerous and its products are diverse—each having its own transport characteristics.”

NEED FOR CO-ORDINATION

Stressing the importance of co-ordination of Government policies for a centrally administrated industry like the chemical industry, Mr. Popatlal said: “In a vast country like ours, complete streamlining of policies and absolute uniformity are more idealistic than practicable, but when the treatment of industry varies so widely from State to State as to interfere with its day-to-day working, and discriminate, however unwittingly it may be, between units in different parts of the country, we feel that something must be done to arrest this process of piece-meal administration of highly individualistic policies. It is difficult to resign ourselves to the fact that the Central Government have to rely more on their persuasive powers with the States in matters like Sales Tax than on any statutory or constitutional remedies.”

Concluding his address, Mr. Popatlal declared that Sindri had not only laid the foundation for an industry vital to the nation's agricul-

ture, but what was more significant, the nucleus had been formed for major heavy chemical industries.

Mr. K. C. REDDY'S ADDRESS

Inaugurating the deliberations of the session Mr. K. C. Reddy said that by unravelling the intricacies of the constitution of matter and by synthesizing various products, the chemist had developed a powerful instrument. Although this instrument had sometimes been misused and applied for destructive ends, its potentialities for constructive gains were enormous. With the help of chemical fertilisers, for instance, an increase in agricultural production had been achieved, he said. “In the shape of various chemicals, plastics, artificial textile fibres and numerous substitutes for natural products, chemistry has contributed to the reducing of shortages, the evening-out of disparities and to a general rise in living standards. It has opened up a large field in the manufacture of drugs and pharmaceuticals and thereby helped in the alleviation of suffering and the promotion of the well-being of humanity.”

Referring to the First Five-Year Plan Mr. Reddy said that although it laid greater emphasis on agriculture, irrigation and power generation than on industrial development, the emphasis was bound to shift in the next Plan.

As regards the various issues affecting the industry referred to by Mr. Popatlal in the course of his address, Mr. Reddy said that they were issues to be dealt with by several Ministries, but that Government would continue to give due attention to them.

In closing, Mr. Reddy paid a tribute to Mr. P. C. Ray, the founder of the Association, and commended the useful work in which it had been engaging itself in the last fifteen years.

Mr. B. K. Muzumdar, the incoming President, thanked the Union Minister.

RESOLUTIONS

Resolutions passed at the Association included, among others, the following :

(1) The Association urges Government to formulate at an early date a co-ordinated and comprehensive policy for the chemical and allied industries in consultation with the Association.

(2) The Association views with grave concern the large un-utilized capacities in different sections of the

chemical industry and urges upon Government to take a more positive and protectionist attitude in determining import policies.

(3) The Association while welcoming the labours of the Tariff Commission in considering cases of tariff protection to industries including chemical industries is of the opinion that the present organisation of the commission as set up to-day cannot go very far in promoting the rapid development of chemical industries, and would, therefore, recommend to Government to consider the feasibility of strengthening the personnel of commission, especially for looking into cases of industries at their planning level.

(4) The Association would stress the need for a more sympathetic Railway freight policy in regard to the chemical and pharmaceutical industry. (This resolution was moved by Mr. R. Chakravathy, our Resident Representative in New Delhi. A brief summary of his speech appears elsewhere in this issue.)



THE BRITISH WORKER: By FERDYNAND ZWEIG, Penguin Books, Harmondsworth, Middlesex.

WHAT sort of a person is the British Worker? We shall never know, as Professor Mace rightly says in his Foreword to this book. The answer largely depends on whether the leader writer in *The Times* or the cartoonist in *Punch* or the editor of the *Daily Worker* asks the question.

Here is, however, a picture of the British working man as he appears to an honest and intelligent foreign observer.

Professor Zweig sees the British worker at work, in the home, and at leisure. But wherever or in whatever circumstances he is seen, he is seen not as a unit of manpower, but as a

personality. The result is therefore a rich, human document, a near-social novel.

To quote from Mr. Mace's Foreword again: "*The British Worker* is an invaluable source book for the student of social psychology."

Some of the things that we learn from the book are that in the life of the British Worker (1) sport occupies the place previously occupied by religion; (2) at least one in four either never bothered about women or after the age of thirty led a completely chaste life; and (3) the worker's interpretation of life is inclined to be materialistic, qualified by a certain idealism derived from the Bible.

If some Indian student of social psychology were to attempt a similar study, we could have the answers to some of our own special problems. Far better, perhaps, it would be if some visiting foreign professor were to undertake the task.

— R. P.



Mr. S. Vaidyanatha Iyer, Board Chairman, welcomes Dr. Alagappa Chettiar.

THE Staff Association Annual Day which was celebrated on January 10 was a memorable function in many ways. For one thing, we had as our chief guest Dr. Rm. Alagappa Chettiar, the well-known commercial magnate, philanthropist and patron of the sciences. He made a sparkling speech spiced with wit and anecdote.

For another, we had with us on the occasion Mr. V. Seshasayee, after a long absence. As this was Mr. Seshasayee's first appearance in Mettur after his recent illness, he was particularly welcome.

The proceedings began with an invocation song by T. K. Sitaraman, our popular Radio star.

Mr. Seshasayee then said 'welcome' to Dr. Alagappa Chettiar and other guests in a brief speech and requested Mr. S. Vaidyanatha Iyer, Board Chairman, to present to Dr. Chettiar, an address of welcome on behalf of the Board of Directors of the Company.

Staff Association

Mr. Seshasayee paid a glowing tribute to Dr. Chettiar for his munificent donations to various educational institutions.

The desirability of having a standard form of prayer was also touched upon by Mr. Seshasayee. The hymn *Raghupathi Raghava Raja Ram* appeared to him to be most suitable, he said. It was brief in form, rich in content, catholic in appeal, and prayed to God only for the granting of wisdom to all.

In the address presented to Dr. Chettiar, Mr. Vaidyanatha Iyer referred to the singular appositeness of the founder of the Central electro-chemical Research Institute being associated with the Staff Day celebrations of a pioneer electro-chemical company, like MCIC. Indeed, Dr. Chettiar was an overdue guest, and the Company was grateful to him for the honour of his presence with them on that day, Mr. Vaidyanatha Iyer added.

Turning to staff, Mr. Vaidyanatha Iyer said that despite loss in production on account of continued power shortage, the Directors had been pleased to sanction increments, bonus, etc., and that staff and labour should put forth their best efforts for maximum production during the year.

Mr. T. Subbaratnam then presented the Annual Report for 1953. The report gave a succinct account of the activities of the Staff Association for the year.

Dr. Alagappa Chettiar then gave away the prizes to the various successful contestants in sports and games.

The Annual Day gives staff, among other things, an opportunity to revel

Annual Day

themselves incognito, but this year not many made up their minds, faces or bodies! Indeed, there was such a paucity of Fancy Dress competitors that it proved to be a walk-over for a cripple! K. Rajagopal, Engineering Superintendent, was the cripple. His make-up as a wounded war veteran simply beggared description. His only other competitor was V. Subramanian who showed up as *Kali*, the disguise in which Rajagopal had made costume history in the last season.

Now to a brief account of Dr. Chettiar's speech: It would be impossible to recapture the fine, careless rapture of his address, but still here goes our lame and halting report.

Dr. Chettiar first said that he considered it a great privilege to have been asked to participate in our Staff Day function. He then expressed his "sincere admiration" for the good work that was being done by MCIC.

Paying a tribute to Mr. Seshasayee for all that he had been doing for the cause of industry in S. India, Dr. Chettiar humorously referred to him as a "chemical compound". Despite his frail physical frame, Mr. Seshasayee had been able to achieve great things because of his integrity and goodness, he said.

Stating that man was a beggar not by necessity but by choice, Dr. Chettiar remarked that a great deal of energy would have been lost, if the Mettur Dam had not been constructed. All the energies locked up in nature should be released for the benefit of man, he said.

"In the good old days men were content with food and shelter, but

with the march of civilization they demanded what were called consumer goods. The scientists of the country should think in terms of the convertible value of things — if I may say so — in the interests of the common man."

Continuing, the speaker declared that the welfare of an increasing population (the population of the world was going up by 60,000 persons every 24 hours — that of India by 14000 —) could be achieved only by the production of more and more goods at less and less prices. Only by the application of chemistry to industrial uses, could the wants of men be met, he added.

"There is a power above. We can erect dams, but we need water. We have no hand in providing rain, although scientists have been working on it in their own way. Scientists should cultivate and develop a spirit of reverence for the Maker."

Concluding Dr. Chettiar congratulated the Staff Association on its achievements and accomplishments.



K. Rajagopal as cripple.

PRIZE-WINNERS

In Sports

GAMES.	WINNERS.	RUNNERS-UP.
1. <i>Tennis</i> : (Singles) Qualifying Round	P. B. Srirangan A. R. Narayanan	N. Sundaresan
2. <i>Tennis</i> (Doubles) (Handicap)	P. B. Srirangan and A. R. Narayanan	S. Ramaswamy and S. Ramamurthi
3. <i>Badminton</i> : (Doubles) Qualifying Round	S. Sambandamurthy and C. S. Ramaswamy N. Venkatachalam and S. Rajan	K. Ganesh and K. Sampath
4. <i>Badminton</i> : (Fives)	P. B. Srirangan P. R. Subramanian D. Rajan S. Panchapakesa Iyer and A. Krishnamurthi	R. Krishnaswamy R. G. Raghavan K. Subramanian N. Kalyanam and S. Ramamurthy (A.E)
5. <i>Volleyball</i> : (Trebles)	S. Muniappan A. P. Krishnan and T. S. Subba Rao	K. Sampath G. Jayaraman and M. A. Shanmugam
6. <i>Volleyball</i> : (Sixes)	N. Subramanian A. P. Krishnan P. B. Srirangan V. Subramanian S. Ramamurthy (A.E.) and A. Parameswaran	N. Venkatachalam V. Vaidyanathaswamy N. Srinivasan Bhaskaran T. Anthony and R. V. Ramiah
7. <i>Table Tennis</i> : (Singles) Qualifying Round	V. Vaidyanathaswamy T. V. Krishnamurthi	T. S. Subba Rao
8. <i>Table Tennis</i> : (Doubles)	V. Vaidyanathaswamy and M. Padmanabhan	S. Sambandam and R. Natarajan (J.E)

GAMES	WINNERS.	RUNNERS-UP.
9. <i>Tennikoit</i> : (Doubles) Qualifying Round	S. Muniappan and T. P. Ramaswami N. Venkatachalam and P. B. Gopalan	T. Anthony and C. S. Srinivasan
10. <i>Carroms</i> : (Doubles)	K. Rethinam and T. K. Sitharaman P. R. Subramanian	T. D. Krishnaswamy and N. Srinivasan T. K. Sitharaman
11. <i>Chess</i> :	K. Rajagopal and P. A. Raghupathy Iyer	A. R. Narayanan and T. V. Krishnamurthi
12. <i>Contract Bridge</i> :	A. R. Narayanan and K. V. Subramanian	K. Rajagopal and P. A. Raghupathy Iyer.
13. <i>Auction Bridge</i> :	A. R. Narayanan and R. G. Raghavan and K. V. Subramanian	S. Ramaswamy K. Rajagopal and K. Ramnath
14. <i>Literature</i> :	V. Subramanian R. S. Subramanian B. Hariharan and N. S. Parameswaran	P. R. Subramanian M. A. Arokiaswami D. Rethinam and R. Krishnaswami
15. 904 :	T. S. Subba Rao (Captain) N. Narayana Rao K. R. Ramakrishnan P. R. Venkateswaran T. G. Gengan T. S. Srinivasa Rao K. Ramanathan S. Ramamurthy (A.E.) A. Krishnamurthi M. A. Shanmugam and N. Sundaresan	
16. <i>Cricket</i> :	N. Kalyanam	
17. <i>Best Batsman of the Season</i> :	N. Narayana Rao	
<i>Best Bowler of the Season</i> :		
<i>Consolation Prize</i> :	K. K. DHARMARAJAN	

PRIZE-WINNERS

In field events

Cricket Ball Throw		A. R. Narayanan	
P. Chockalingam	I Prize	P. R. Subramanian	
S. Muniappan	II Prize	K. Sampath	
Long Jump		K. R. Ramakrishnan	
L. Venkatadoss	I Prize	V. Subramanian	
R. Krishnaswamy	II Prize	Vyyappan	Runners up
High Jump		S. K. Chakarapani	
R. Krishnaswamy	I Prize	G. Natarajan	
V. Subramanian	II Prize	V. Swaminathan	
Hop, Step and Jump		R. Natarajan (J.R.)	
L. Venkatadoss	I Prize	and	
T. Antony	II Prize	N. Venkatachalam	
Pole Vault		Fancy Dress	
L. Venkatadoss	I Prize	"CRIPPLE"—K. Rajagopal	I Prize
P. Chockalingam	II Prize	"KALI"—V. Subramanian	II Prize
Slow Cycle Race		CHILDREN'S EVENTS	
R. Dorairaj	I Prize	Musical Chairs for Girls	
J. Arumugam	II Prize	A. Danalakshmi,	
Shot Put		d/o Appu Chettiar	I Prize
L. Venkatadoss	I Prize	R. Santha	
T. A. Javanthinathan	II Prize	d/o R. V. Ramiah	II Prize
Tug of War		Potato Race for Boys	
S. S. Sastry		Manickam, s/o Vellayan	I Prize
A. P. S. Mani		Rajagopal, s/o Govinda-	
Arumugam		samy	II Prize
Mohamed Shah		Doraiswami, c/o Subra-	
Rajaram		manian	II Prize
Chinnan		110 Yds. Running Race for Boys	
Nagarajan	Winners	S. Raman, s/o O. B. S.	
Perumal		Srinivasa Iyer	I Prize
Subramanian		Chinnaraj, s/o Muthial	
A. V. Thomas		Naidu	II Prize
and		Pickers Events-Table Tennis	
T. A. Javanthinathan		R. Ethiraju	I Prize
		Ramaswamy	II Prize
		Throwing the Tennis Ball	
		Thangavelu	I Prize
		Robert	II Prize
		Jayaraman	III Prize



Society of Technologists: The types of A. C. motors, in general use, the principle behind the working of three-phase induction motors, the need for induction motors and their general classification were all dealt with in an interesting paper presented by Mr. C. R. Radhakrishnan, Junior Engineer, at a meeting of the Society of Technologists held on October 28.

On December 28, Mr. K. R. Dorairaj of the College of Engineering, Kakinada, (son of Mr. K. V. Ramachandran, Senior Chemist) gave a very fine talk on "Prestressed Concrete."

A summary of the talk is reproduced elsewhere in this issue.

Mr. K. R. Thiagaraja Iyer, Managing Director, Chemicals and Fertilisers Limited, presided.

Mr. K. R. Thiagaraja Iyer was himself the speaker at the meeting held on December 29, his subject being "Order in the Universe." In the course of an interesting talk, the speaker brought out how all the events in man's daily life could be related to a definite order and how both man and matter were governed by certain fundamental laws.

Staff Association—Office-Bearers:

Office bearers for the new year are:

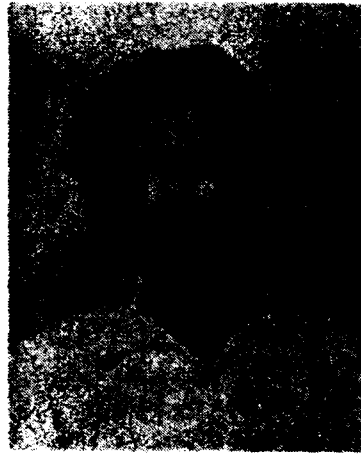
N. Krishniah	Vice-President.
N. Sundaresan	} Joint Secretaries.
N. Kalyanam	
P. Vedanayagam	Treasurer.
T. D. Krishnaswamy	Sports Member.
A. Krishnamurthy	} Members in charge of Reading Room and Library.
V. Muthuswamy	

The opportunity of the annual general body meeting of the Association on January 3, was availed to wish *bon voyage* to Mr. S. Ramaswamy, Production Superintendent—and outgoing vice-president—who was leaving on a brief business tour to Europe and the U. K. Later there was a dinner.

A feature of the election this year was that for the first time in the history of the Association there were nine members contesting the available seven seats. Usually, it was a job finding as many nominations as there were vacancies!

Pictures: Films screened in recent months included:

High Barbaree, Show-off, This man's Navy, Search, Dick Tracy (M. G. M) Strangers on a train, The great Jewel Robber, Robin Hood (Warner Bros.), Unto the Blue, Radio Service, Nurse (B. I. S.), Triumph in the wilderness, Women and the Community, The Human Body, Peanuts—a valuable crop. (U. S. I. S.)



M. Perumal

Obituary: The death occurred of M. Perumal, Attender, Soap Plant, on November 7, in pathetic circumstances. Perumal went to his native village, Jalakantapuram, to see his ailing mother, and was so moved by her condition that he himself collapsed. In his death, we mourn the loss of loyal, active and well-behaved young man. May his soul rest in peace!

School functions: The United Nations Day was celebrated by the Mettur Chemicals Secondary School on November 11, with Mr. K. Rajagopal, Engineering Superintendent, in the chair. Mr. Rajagopal spoke at length on the organisation, aims and objects of the UN.

January 26, the country's Republic Day, was celebrated with great eclat by the Mettur Chemicals School. The function was attended by a large gathering of pupils and members of the public. Mr. R. Natarajan, Secretary, Mettur Chemical and Industrial Corporation Ltd., who presided hoisted the National Flag and took the

salute during the march past of the pupils. Later, the pupils gave a demonstration of their attainments in scoutcraft and citizenship training.

Addressing the pupils, Mr. Natarajan dwelt on the importance of the day.

With the distribution of sweets to the pupils and the singing of the National Anthem, the function came to a close.

Mr. P. B. Srirangan, skipper of the Mettur Chemicals Cricket Team, inaugurated the Mettur Chemicals Secondary School Cricket Club on February 5. The function was largely attended.

After "setting a cricket ball rolling," Mr. Srirangan commended, in a brief speech, the enthusiasm evinced by the pupils of the school and advised them to develop a sustained interest for this king of all games.

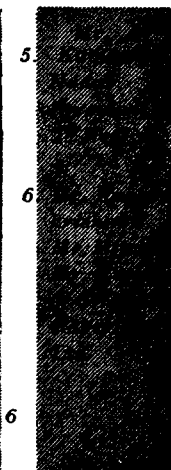
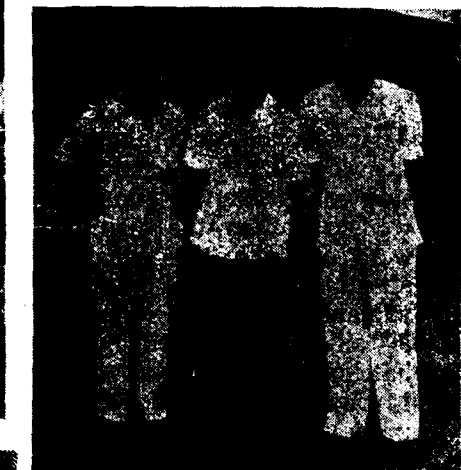
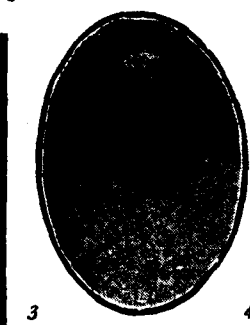
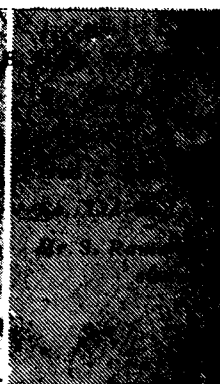
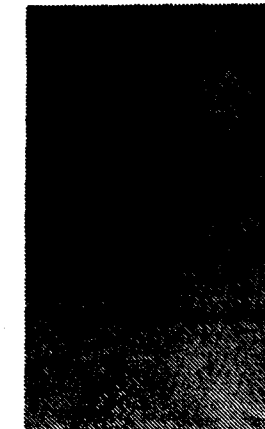
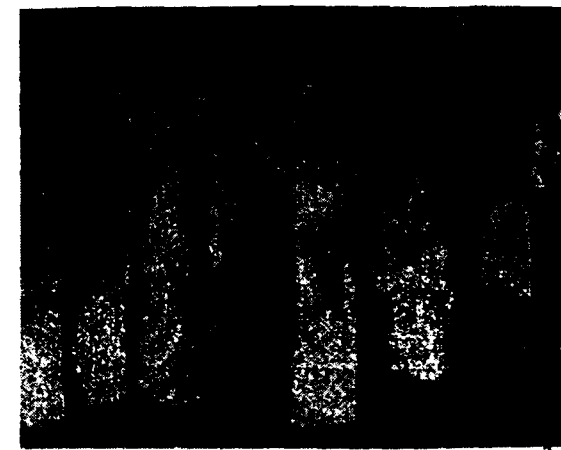
The function came to a close with three cheers to Mr. Srirangan.

Weddings: Our congratulations and good wishes go to the following couples who recently entered the married state.

R. Lakshminarasimhan (Operator Brine Room) with Miss Pankajam.

G. Krishnamurthi (alias) Gopal Accounts Section, with Miss Kasthuri Bai and Mr. R. Srinivasan with Miss Rani Bai, daughter of Mr. G. Venkataramiah Naidu, Staff and Welfare Officer. Mr. Krishnamurthi is Mr. Naidu's brother.

Mr. Naidu held a reception in connection with the last two weddings on February 6, which was largely attended.





Cricket: Playing against the Municipal High School XI, Salem, on our grounds, on August 30, we first piled up a big total of 182 runs. N. Narayana Rao (58) and N. Kalyanam (26) were the main scorers. When we took the field and the visitors scored only 69 for 7, our hopes soared high. And then came a big stab in the back, and we had to content ourselves with a draw.

How it all came about is a little saga in gallantry. One of our promising youngsters, Kolandaisamy, whom we had lent to the visitors (as they were one short) nonchalantly defied all our bowlers for more than thirty valuable minutes in a fine innings of 34, aided and abetted by some good batting from Shaukat Ali (32) and Marimuthu (25) and was still there, until we called it a day, baulking us of what seemed certain victory.

M C I C.—182 (Narayana Rao 58, Kalyanam 26, Ramalingam 3 for 48, Seshadri 3 for 45).

M. H. S.—131 for 8 (Kolandaisamy 34, N. O. Shauckati Ali 32, Marimuthu 25, Narayana Rao 4 for 29, Raju 2 for 45).

A glorious unbeaten century by our Narayana Rao was the highlight of the match played against the G. H. M.

High School, Salem, played here on September 6, which we won by the very comfortable margin of 112 runs. Narayana Rao thus became the second centurion of our club, the first to achieve this distinction being R. R. Murugiah who hit up two centuries in one season in 1951. (115 n.o. against M. S. V. Thatham's XI, Srirangam, and 102, retired, against M. R. C., Mettur Dam.). Narayana Rao's score included twelve fours. His century took him 107 minutes. Kalyanam, with a stylish 50, put on 75 runs with him for the 3rd wicket. Incidentally, our total of 213 for 5 (declared) is the highest ever achieved by us! Our bowlers, Ganesh and T. D. K. Sami, proved much too devastating for the visitors' batsmen.

M C I C.—213 for 5 (declared) (N. Narayana Rao 100, not out, N. Kalyanam 50, Noor Ahmed 2 for 21).

G.H.M.H. School, Salem—101 (K. Ganesh 4 for 9, T. D. K. Sami 3 for 19, R. G. Raghavan 2 for 31).

Tennis: Recent entrants are fast picking up the game. The pace of progress of A. R. Narayanan, in particular, is terrific.

Volleyball: We played a Sixes match against the P. S. G. Arts College, Coimbatore, on our grounds on October 17. It was practically a one-sided affair, and our players were on the wrong side!

Neither did we fare any better in a Trebles match with a Mettur Town team played here in November 1953, being routed again in two straight games.

Really, it is galling to think that our Team which was once a name to

conjure with in and around Mettur, should of late be displaying such poor form.

Badminton: Something to write home about in this department. We played two Fives matches against the Mettur Recreation Club Team in October last and won both of them, the first match in two straight games.

The courts are, however, as deserted as ever. 'Why,' one asks. Echo answers 'why'.

Tennikoit: Our veterans have practically "retired"—or so it seems. It looks as though the freedom of the tennikoit court has now been conferred upon the youngsters of the colony. And although we blush to mention it, it looks as if the boys would, one of these fine days, give us, their elders and betters, a severe hiding.

Table Tennis: Continues to be popular and is attracting many new players. The superior or inferior quality of the balls that we order is of little account to some of our players! When it comes to breaking, they would not discriminate—no, not they. A redeeming feature, however, is the wear and tear on the table is not correspondingly as high.

Caroms: All of a sudden there has been such a stampede for this indoor game that players have to wait for hours on end before they can get a chance. And seriously speaking, we have some very good pocketers.

Contract Bridge: This is a very popular pastime now and there are always enough players to make a fifth, sixth and even seventh at a table! As

the onlooker sees most of the game, it is little wonder he is more vociferous than the players themselves as to how each hand ought to have been played!

Staff Day Tourney: A great deal of preparation goes into this annual affair, and credit is to be given to the members of the Tournament Committee (R. Govindarajan, M. Padmanabhan, K. Sampath and S. Sambandamunthi, headed by our energetic Sports Member, N. Venkatachalam) who organised this year's matches and events. Quite a heavy programme was gone through in record time. Once or twice, however, a match could not be played on the scheduled day for such valid reasons as 'Dusserah holidays', 'Loose tension in one's tennis racket', and so on! But, by and large, the sportsmen vouchsafed magnificent co-operation to the Committee.

Cricket: (4 entries.) The first match between T. S. Subba Rao's XI and K. Sampath's XI played on November 29, ended in a victory for the former by 72 runs. After an initial set-back, K. R. Ramakrishnan and A. Kolandaisamy came together (playing for Subba Rao's XI) and put on 81 valuable runs for the 5th wicket, themselves scoring 55 and 35 respectively. C. Kandasamy, our new pace bowler, in a deadly spell, captured 6 wickets for 33 runs. Excepting for K. Ganesh who played a lone but brave innings of 30, not out, none of the other batsman in Sampath's Team fared well and they were all out for 66.

T. S. Subba Rao's XI: 138 (K. R. Ramakrishnan 55, A. Kolandaisamy 35, T. S. Subba Rao 22, C. Kandasamy 6 for 33, K. Ganesh 4 for 38).

K. Sampath's XI : 66 (K. Ganesh 30 n. o., K. R. Ramakrishna 4 for 23, N. Narayanan 3 for 19, T. S. Subba Rao 2 for 4).

P. B. Srirangan's XI defeated R. G. Raghavan's XI in a very exciting match on December 6, by one wicket. Batting first, the latter piled up a good total of 132. Kalyanam gave a brilliant display and hit up 58 and R. G. Raghavan scored 33. When Srirangan's XI went into bat, four wickets fell for 25 runs. Only T. D. K. Sami showed anything like confidence, but the question was whether the remaining batsmen, beginners for the most part, would sustain him. P. R. Subba Rao, who was No. 6, attempted a recovery by playing a stubborn innings (though he scored only 12) and added 36 useful runs for the fifth wicket. Then with Raju came another 29 runs, and the score was 90 for 6. When C. S. Srinivasan next came in and went out for 0, tension mounted. The score was 95 for 7. In came T. A. J. Nath, swung his bat lustily, collected 6 runs and went back. It was 105 for 8. All the while T. D. K. Sami remained most unperturbed, playing orthodox cricket, punishing the loose ones, scoring only in 2's and stealing a single in the last ball of the over, thus cleverly farming the bowling.

Sambandamurthy who came in as No. 10 refused to emulate his predecessor, and was rightly content to protect his wicket. The stand with him yielded 23 valuable runs.

When Sambandam's contribution was 4, Kalyanam was brought on to bowl, and he at once clean-bowled him off the very first ball. The total came to 128 for 9 and excitement

reached fever-pitch. In came No. 11, P. R. Subramanian, who was wielding a cricket bat for the first time in his life, and who had to survive the five remaining balls of the over from Kalyanam, before T. D. K. Sami could take over. As the fieldsmen crouched around him vulture-like, the second ball flew past his bat and stumps, but no damage was done. Three more balls went the same way and when the last ball also went wide of both bat and the stumps, the cheering was deafening. T. D. K. Sami now facing R. G. Raghavan easily scored the 5 runs needed, and gave his side a great and well-earned victory. He had given a masterly display, scoring 82, n. o., and was cheered all the way to the pavilion.

R. G. Raghavan's XI—142 (N. Kalyanam 58, R. G. Raghavan 33, T. D. K. Sami 4 for 54, Raju 3 for 42).

P. B. Srirangan's XI—133 for 9 (T. D. K. Sami 82 n. o., R. G. Raghavan 5 for 61, N. Kalyanam 2 for 40, K. R. V. Raman 2 for 30).

The finals between P. B. Srirangan's XI and T. S. Subba Rao's XI played on December 13, ended in a victory for the latter by 44 runs.

Put into bat after losing the toss, T. S. Subba Rao's XI lost 6 wickets for 53 runs. Then came N. Narayana Rao who began to hit the bowling all round. He received wonderful support from the left-handed veteran S. Ramamurti (A. E.) who himself scoring only 7, added 42 useful runs to the seventh wicket. Narayana Rao was unlucky to be run out after a fine innings of 59, when the total was 101.

Srirangan's XI fared worse when their batting turn came. Two wickets fell for 8, and when T. D. K. Sami, the hero of the previous match, came into bat, he was naturally the cynosure of all eyes. Facing Narayana Rao he played defensively to the first ball. While playing slightly back to the next delivery, the ball caught the edge of the bat and disturbed the stumps. It was a big blow for the team. Excepting for another stubborn innings of 22 from P. R. Subba Rao, none else could stand up to Narayana Rao. The end was nearing and when A. Krishnamurti caught Sambandam in the slips, Subba Rao's XI had won. N. Narayana Rao capped a fine batting performance with fine bowling as well, capturing 7 wickets for 23 runs.

T. S. Subba Rao's XI—101 (N. Narayana Rao 59, T. D. K. Sami 3 for 55, Raju 3 for 31, Antony 2 for 25.)

P. B. Srirangan's XI—57 (P. R. Subba Rao 22, N. Narayana Rao 7 for 23, K. R. Ramakrishnan 2 for 131).

Tennis: (Singles)—13 entries. P. B. Srirangan met with stiff opposition from T. V. Krishnamurti in the semi-finals. He staged, however, a remarkable recovery in the third set, after being down by 2 games to 5, and his opponent holding 5 set points, to win the set and the match. A. R. Narayanan was the winner in the qualifying round. P. B. Srirangan beat N. Sundaresan in the two finals in two straight sets. Sundaresan was somehow not in form on that day.

(Doubles)—7 entries. P. B. Srirangan won the doubles title also.

Partnering A. R. Narayanan, he beat S. Ramaswamy and S. Ramamurti in a keen and thrilling encounter.

Table Tennis: (Singles)—27 entries. A new champion was crowned this year. V. Vaidyanathaswamy after getting the better of Chandramouli and Srirangan in closely fought rounds, beat T. S. Subba Rao (last year's No. 1) in the finals after a tense five-game duel. T. V. Krishnamurti won the qualifying round.

(Doubles)—12 entries: V. Vaidyanathaswamy, partnering M. Padmanabhan, annexed the doubles title also, defeating S. Sambandam and R. Natarajan (J. E.) in the finals.

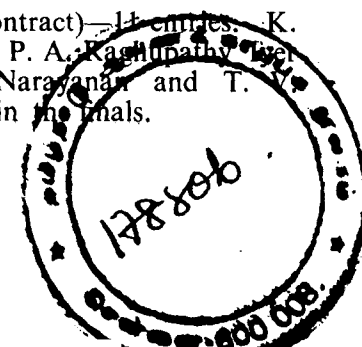
Badminton: (Doubles)—14 entries. S. Sambandam and C. S. Ramaswamy beat K. Sampath and K. Ganesh in the finals. N. Venkatachalam and S. Rajan were the winners in the qualifying round.

(Fives)—8 entries. P. B. Srirangan's Team beat R. Krishnasamy's Team in the Finals.

Volleyball: (Trebles)—9 entries. S. Muniyappan's Team beat K. Sampath's Team in two games in the finals.

Volleyball: (Sixes)—12 entries. N. Subramanian's Team beat N. Venkatachalam's in the finals in two straight games. Earlier in the semi-finals, M. Padmanabhan's Team gave a terrific fight to the runners-up.

Bridge: (Contract)—14 entries. K. Rajagopal and P. A. Raghupathi beat A. R. Narayanan and T. Krishnamurti in the finals.



Bridge: (Auction)—17 entries. A. R. Narayanan and K. V. Subramanian beat K. Rajagopal and P. A. Raghupathy Iyer in the finals.

Literature: 12 entries. A. R. Narayanan and partners beat K. Rajagopal and partners in the finals.

904: 12 entries. This game was introduced by popular request. B. Hariharan and partners beat P. R. Subramanian and partners in the finals.

Caroms: 10 teams—K. Rethinam and T. K. Sitaraman beat easily T. D. K. Sami and N. Srinivasan in the finals.

Field and Track events: As usual, quite a good number participated in these events. Tug-of-war was re-introduced this year after a fairly long interval. Sack race and three-legged races were abandoned. After last year's experience of abrasions and injuries, we reached the only conclusion possible in the circumstances—namely, that until we had a first-class and fully-equipped hospital on hand we should not stage these events, as it would mean overtaxing the resources and ingenuity of our first-aid post and personnel respectively!

Free World's Oil Refining Capacity.

In the free world outside the U. S. A. and Canada, oil refining capacity has doubled within the past six years, reaching an annual intake capacity of about 250 million metric tons at the beginning of 1954. There are firm projects in hand for adding about 50 million tons capacity within the next two or three years, over half of it during 1954. By the end of this year the total refining capacity will reach about 276 million tons. Western Europe's rapid refinery expansion is nearly ended, but new projects are in hand in India, Australia, Aden, Mexico and Brazil.

Annual refining capacity in the U. S. A. and Canada, which totalled over 300 million tons early in 1948, has risen since then by about 50 per cent to 460 million tons at the beginning of 1954. Thus, capacity in the whole free world, including North America, which was about 430 million tons in 1948, is now about 710 million tons, or 683 million tons if the idle capacity at Abadan and Haifa is left out of account.



The lovable showman: A great Hindu festival which is celebrated throughout the country with regional variations is the *Dusserah* or the Festival of Ten Nights. A feature of the festival, as celebrated this side of the Vindhyas, is the doll-show or *kolu* got up in most houses on the ten nights. As a rule, these shows are arranged by the distaff side.

The star attraction in Mettur during *Dusserah* this (Tamil) year was the *kolu* in the home of Mr. R. Narasimha Rao, our Boiler Engineer, and Mrs. Rao. And MISTER RAO had a hand in it. Mind you, Rao is none of your namby-pambies. Beside the stories of his exploits of big game hunting, those of Frank Buck of "Bring 'em back alive" fame would read like the minor adventures of a school-boy with a catapult!

The secret of success of the grand show put up by the Raos is easily explained. The dolls were not bazaar-brought, but home-made—made by the loving and painstaking hands of Mr. Rao and his helpmeet.

One "sequence" which elicited particularly warm praise was the story of Rama's Exile in the Forest.

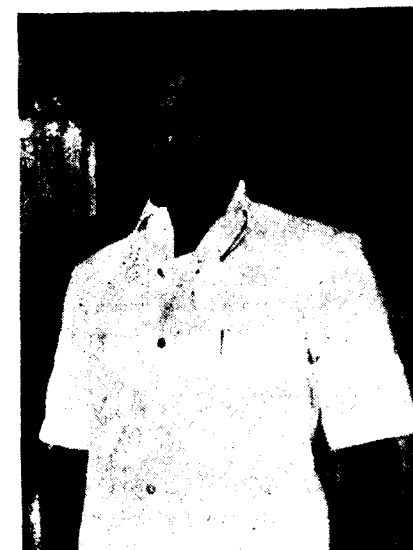
Mr. Rao's experience of erection and maintenance of boilers extends

over a period of nearly 30 years. Obtaining his certificate of Mechanical Engineering from the School of Engineering, Bangalore, as far back as 1921, Rao first served as a Shift Engineer with the East India Distilleries, Kulasekharapatnam. Later, for brief periods, he was with three sugar factories—Nizam, Vuyyur and Pugalur. He came to us in 1942, and evidently at Mettur, he found the right company—a company congenial to his soul. And we sincerely hope that he would be with us for many more years.

In his schooldays, Rao had played quite a lot of foot-ball, cricket and hockey. Small wonder, son Narayanan is such an outstanding performer both with the bat and the ball. Illustrious chip off the old block, eh?

* * *

Sweetness and Light: In Shakespeare's *King John*, Prince Arthur



R. Narasimha Rao.

pleads with Hubert, in a memorable passage, for sparing his eyes which Hubert had been asked to put out with red-hot irons.

In sooth, I would you were a little sick

That I might sit all night and watch with you :

I warrant I love you more than you do me.

And we have sometimes wondered whether some of our men do not simulate illness or develop one fever



G. Venkataramiah Naidu.

or another just to have Mr. G. Venkataramiah Naidu, our Staff and Welfare Officer, sit and watch with them !

However busy he might be, and often he has to be very busy — one of the pastimes of a Welfare State being perpetual form-filling — Naidu somehow manages the time to go a-visiting the sick. His message of cheer and hope has often acted like a tonic —

sometimes even more than a tonic — on our sick men.

If Naidu is such a ministering angel to-day, it is probably because of his Scouting background. As a college Rover — he did his Intermediate at the Finlay College, Mannargudi, and B. A. at the Loyola, Madras — Naidu distinguished himself by being the first in the Madras Presidency to secure the coveted "Rambler's Badge."

Naidu is quite a scholar both in Tamil and Telugu. In the High School, his second language was Telugu, and in the College it was Tamil—which is something of a feat—if you know your Tamil.

Before he started spreading sweetness in Mettur, Naidu was engaged in spreading "light" elsewhere—he was with the South Madras Electric Supply Corporation Limited, a sister company for five years—from 34 to 39.

As our Welfare Officer, the commissariat portfolio is Naidu's special responsibility. He minds the canteen business so well, indeed, that realising his gifts in the line, if he set up (on retirement) a swank establishment like Delhi's Imperial or Bombay's Taj, at least K. Ramanath, our Works Manager, will not be surprised !

(Mr. Naidu attended, as a delegate, the second annual session of the All-India Labour and Welfare Officers' Conference held recently in Madras.)

* * *



M. Ramaswami Naidu.

He gets up steam: Meet Mr. M. Ramaswami Naidu, our Boiler Engineer's able assistant. One of our trusted and sincere workers, he is an expert fitter.

Naidu has seen service in several parts of the country. Starting his career as an apprentice in the Fitting Shop of the Nizam State Railway, Naidu later served for some years with the Bombay-Abadan Steamer Service Company, Bombay. In 1924, he took a third-class certificate of the Steam Department, Bombay, and was for several years with the construction unit of the Tata Power House, Bombay.

In 1936, Naidu was with the Mettur Industries around the period of their boiler erection, came to us in 1937, went to Delhi in 1938, and came back to us finally in 1942.

Notwithstanding his age—he is fifty-four now—Naidu is a man of very active habits.

* * *

Fire-fighter: Yet another worker to whom we would like you to say "Hullo" is P. Rengaswamy, Fitter and President of the Workers' Union.

In a recent emergency, he displayed phenomenal courage.

Fire had started in a wagon loaded with bags of burnt lime—rain water having leaked on to them.

In bringing this fire under control, Rengaswami showed alertness, imagination and daring.

Rengaswami came to us in 1941. Prior to joining MCIC, he was with the Public Works Department and had worked with the transport section of P. W. Construction at the time of the construction of the Stanley Dam.

A good fitter, he is noted alike for his neatness and earnestness.



P. Rengaswami.

Rengaswami was elected President of the Workers' Union last year.



Hydrazine for removal of free chlorine in hydrochloric acid: Hydrazine in the form of hydrazine hydrate has been employed recently to remove free chlorine from hydrochloric acid. The hydrazine combines with the free chlorine to form hydrochloric acid and nitrogen. In the operation, chlorine-free acid is produced, and the amount of chlorine removed approximates 50 parts per million. This new method is said to offer advantages of both convenience and economy over conventional methods of additional scrubbing or use of antichlors.

Shevaroy bauxites for the dehydration of alcohol to ethylene: It is well known that certain naturally occurring bauxites and clays are used as catalysts in the dehydration of ethyl alcohol to ethylene. In the course of an investigation to study the specificity and capacity of Indian bauxites for this reaction, M. V. Pai and H. K. Joshi of the National Chemical Laboratory, Poona, have found that the bauxites from the Shevaroy

Hills, Salem District, have activities of a higher order than most other catalysts (both aluminas and bauxites) reported in literature, and can therefore be used with advantage in industry in place of the more expensive synthetic aluminas for the catalytic dehydration of alcohol to ethylene.

Manufacture of carbon products :

It is reported that carbon brushes for use in electric motors are now being produced on a pilot-plant scale at the National Physical Laboratory, New Delhi, and supplied to various Government Departments and other industrial concerns. For producing carbon electrodes of large size required for the manufacture of caustic soda and other industrial chemicals, a 200-ton extrusion press has been designed and built in the Laboratory. Preliminary trials have proved successful and rods conforming to rigid specifications have been produced by extrusion. Large-scale trials will be undertaken shortly.

Thorium from monazite sands: The monazite sands of Travancore have a thoria content of 4 per cent in addition to small amounts of other rare earths, particularly cerium. Thorium salts are used in the manufacture of incandescent gas mantles and in glass manufacture, metallurgy and benzene synthesis. Along with mesothorium and uranium, thorium is not

being applied in the field of atomic energy. In addition to rare earths, Travancore monazite contains as much as 28 per cent phosphorous pentoxide, which is valuable as a fertilizer.

A method has been developed by which both rare earths and phosphoric acid could be profitably extracted from the sand. The sand is digested with sulphuric acid and the extract evaporated. Most of the rare earth sulphates are crystallized out and separated. The phosphoric acid remaining over is separated from sulphuric acid by treating it with a calculated volume of alcoholic ammonia, which precipitates sulphuric acid as ammonium sulphate.

Salt production in India : In the course of his speech at the annual meeting of the Salt Advisory Committee held in Madras on November 11, 1953, the Union Minister for Production, Mr. K. C. Reddy reviewed the position of the salt industry in the country, and pointed out that the industry had made rapid strides in the matter of production.

The Minister said: "The total salt production in 1947 at the time of the partition was 516 lakh maunds against our requirements of 650 to 700 lakh maunds. Self-sufficiency was first attained in 1951, while the current year's production up to September

1953 is 820 lakh maunds which is the peak production ever attained".

Referring to consumption and the quality of salt, the Minister said: "Consumption in the country compared with the increased production is yet far below the standard of the world. Even per capita consumption of 14 to 18 lbs. per annum compares very poorly with the world's average of 40 lbs., America's 207 lbs., etc. This is mainly due to the under-development of our heavy chemical industries. The salt manufacturers should, therefore, explore the possibilities of starting chemical and other industries allied or ancillary to the salt industry. Though the Indian Standards Institution has prescribed the minimum percentage of sodium chloride in edible salt as 96 per cent, the standard has yet been kept purposely low in order to assist the backward manufacturers and to avoid hardships to them".

Indian blasting explosives project: An agreement has been reached between the Government of India and the Imperial Chemical Industries Limited, to establish a new company to manufacture India's requirements of commercial blasting high explosives. The company is to be known as Indian Explosives Limited and will have an authorised capital of Rs. 4 crores. The factory is to be located in Bihar close to the coalfields.

Imperial Chemical Industries, besides being responsible for planning the layout of the factory, and providing the designs for the plant and equipment, and for its erection and settling to work, will provide all the technical "know-how" required to operate the factory, and will train Indians to take over responsible positions.

The establishment of this important industrial undertaking will mark a significant step forward in the achievement of India's industrial plans.

India Association of Analysts and Analytical Chemists: The second annual convention of the Indian Association of Analysts and Analytical Chemists was held at Hyderabad (Dn) on December 30-31, 1953, under the presidentship of Dr. K. C. G. Doss of the Indian Institute of Sugar Technology, Kanpur. The convention was attended by delegates from several industries and scientific institutions in India.

Mr. M. Padmanabhan of our company attended the convention.

Dr. S. Husain Zaheer, Director, Central Laboratories for Scientific and Industrial Research, delivered the inaugural address.

A symposium on 'Instrumental methods of analysis' was also held. Mr. M. Padmanabhan presented a paper

on "The Analytical Instruments used in the Chlor-alkali industry" in which he dealt chiefly with the methods of determining:

- (i) Moisture in bleaching powder;
- (ii) Carbon-di-oxide in brine products and flue gases and
- (iii) Purity of chlorine by photometric analysis.

At the conclusion of the symposium Dr. K. C. G. Doss dealt with recent advances in instrumental methods of analysis.

Indian Science Congress: Mr. M. Padmanabhan, also, attended the 41st session of the Indian Science Congress held at Hyderabad on January 2, which was inaugurated by Prime Minister Jawaharlal Nehru.

Mr. Nehru said that the challenge of the day to science and scientists was whether the results of scientific research were going to be used for "evil things" or for the betterment of humanity and removing its many ills.

About 1500 delegates, including several foreign scientists, attended the Congress. Dr. S. L. Hora, President of the Indian Science Congress Association, pleaded for provision of comfortable places of work and good libraries with access to general libraries for scientists, and more studentships and fellowships for junior scientists.



கண் விபத்துக்கள்

T. S. சுப்பராவ்

தொழிற்சாலைகளில் ஏற்படும் விபத்துக்களில் கண்களுக்கு ஏற்படும் அபாயம் மிகவும் கஷ்டத்தை விளைவிக்கக்கூடியது. ஓடும் இயந்திரங்களிலிருந்து சிதறும் வஸ்துக்களினாலும், ரசாயனத் திரவங்கள் படுவதினாலும், விஷப்புகை காற்று முதலியவை தாக்குவதினாலும், "வேல்டிங்", மற்றும் இதர பிரகாசங்களினாலும், கண்களுக்கு அபாயம் நேரிடலாம். மூக்குக்கண்ணாடி, முகமூடி முதலியவைகளை அணிந்து விபத்துக்களைத் தவிர்க்கலாம்.

கண்களில் விழும் பொருள் ரசாயனப் பொருளாக இல்லாமல் கண்ணாடி போன்ற ஒரு பொருளாக இருந்தால் கண்களில் காயம்தான் ஏற்படும். எப்படியானாலும் நிரந்தரமான பார்வை நஷ்டம் ஏற்படக்கூடும். சிக்ரமாக

வேண்டிய சிகிச்சை செய்தாலும் இதைத் தவிர்க்க முடியாது. ஆகையினால், விபத்து நேரிடாவண்ணம் பார்த்துக்கொள்ளவேண்டியதே கடமை.

ரசாயனப் பொருள்கள் தூசி வடிவிலும், கனபதார்த்தங்களின் வடிவிலும் கண்களில் புகலக்கூடும். உதாரணம்: காஸ்டிக் ஸோடா. தூசி கண்களில் விழாமல் பார்த்துக் கொள்ளுவதற்கு தகுந்த கண்ணாடி அணிதல் அவசியம்.

திரவ ரூபமாகவுள்ள ரசாயனப் பொருள்கள் (உதாரணம்: கொதிக்கும் சோப், காஸ்டிக் லை, முதலியவை) கண்களில் புகாமல் இருப்பதற்கும் தகுந்த கண்ணாடிகள் அணிவது ஏற்ற தற்காப்பு முறையாகும். வாயு வடிவிலுள்ள ரசாயனப் பொருள்களும் கண்களைப்



பூ V. K. திருமலை.
தென் இந்தியா உடலழகு சாம்பியன்

கம்பராமாயண கதா காலக்ஷேபம் :

நவம்பர் 25-உழைதல் டிசம்பர் 9-உ வரை கோவை ஸ்ரீ ராமகதாரத்னம் ஸ்ரீ V. தியாகராஜன் அவர்கள் கெமிகல்ஸ் பள்ளிக் கட்டிடத்தில் கம்பராமாயண கதா காலக்ஷேபம் நிகழ்த்தினார்கள். இன்னொரு இடத்திலும் கவிதா ரஸம் ததும்பும்படியும் ராமாயண காவியத்தின் பரிபூரண சுவை கிடைக்கும் படியும் நாடகபாணியில் ஒவ்வொரு கதாபாத்திரத்தின் உணர்ச்சியும் தெளிவாகும்படியும், அவர் காலக்ஷேபத்தை நிகழ்த்தியது மேட்டூர் வாசிகளால் மிகவும் போற்றப்பட்டது. காலக்ஷேபம் பூர்த்தியான டிசம்பர் 9-ம் தேதியன்று பாதுகாபிஷேகம், புருஷஸூக்த ஸ்ரீஸூக்த ஜபம் இவற்றுடன் ஸ்ரீ ராம

பட்டாபிஷேகமானது கொண்டாடப்பட்டது. அதன் பின்னர் ஸ்ரீ கே. ராஜகோபால் அவர்கள் ஸ்ரீ தியாகராஜன் அவர்களுக்கு சபையார் சார்பாக ஒரு பண முடிப்பை அளித்து அன்னருடைய மேதையையும் திறமையையும் பாராட்டிப்பேசினார். கம்பரின் காவியரசத்தை எல்லோரும் அனுபவிக்குமாறும், இதர தமிழ்க் காவியங்களிலிருந்தும் எடுத்துக் கூறிய கவிதைகள் மூலம் தமிழ் மொழியின் சிறப்பை அவர் தெளிவாக்கியதையும் ஸ்ரீ ராஜகோபால் பாராட்டிப்பேசினார்.

சபையார் சார்பாக ஸ்ரீ தியாகராஜனுக்கு ஒரு வாழ்த்துப்பத்திரம் வாசித்து அளிக்கப்பட்டது. இறுதியில் ஸ்ரீ தியாகராஜன் பேசுகையில் சபையார் தனக்கு அளித்த மரியாதையும் புகழாரையும் கம்பனையும் தமிழ்த்தாயையுமே சேரும் என்றும், சிறுவர் உட்பட அனைவரும் ஆர்வத்துடன் காலக்ஷேபத்தைக்கேட்டு வந்ததே கம்பருடைய கவிதா ரஸத்திற்குச் சிறந்த நற்சாஷி என்றும் கூறினார்.



பூ V. தியாகராஜன்
—கம்பராமாயண காலக்ஷேபம்.

ஸ்ரீ வி. தியாகராஜன் அவர்கள் இத்துடன் தமிழ்நாட்டில் 74 இடங்களில் கம்பராமாயண காலக்ஷேபங்கள் செய்திருக்கிறார். அவர் அறிவாற்றலையும் திறமையையும் அனுபவித்து மகிழ்ந்த பெரியோர்களால் 'ஸ்ரீ ராமகதாரத்னம்', 'கம்பன் வல்லான்', 'கம்பர் கவி முழக்கம்' போன்ற விருதுகள் அவருக்கு வழங்கப்பட்டிருக்கின்றன என்பதையும் இங்கு குறிப்பிட விரும்புகிறோம்.



ஸ்ரீ ராதாகல்யாண மஹேந்திரசுவம்.

ஆபீஸர் சங்க ஆண்டுவிழா :

ஜனவரி 10-உ நடைபெற்ற ஆபீஸர் சங்க ஆண்டுவிழாவின்போது, சங்கத்தின் தலைவர் ஸ்ரீ வி. சேஷசாயி, MCIC சேர்மன் ஸ்ரீ S. வைத்தினாத ஐயர், மற்றும் MCIC டைரக்டர்கள் முதலியோர் வந்திருந்தனர். விசேஷ அழைப்பை அங்கேகரித்து பாரதநாட்டு வள்ளல்களில் ஒருவரான டாக்டர் RM. அழகப்ப செட்டியார் அவர்கள் வந்திருந்து, விழாவில் கலந்துகொண்டு சிறப்பித்தார். இவ்வாண்டு விழாவை ஒட்டி நடந்த போட்டிகளில் ஜெயித்தவர்களுக்கு டாக்டர் அழகப்ப செட்டியார் அவர்கள் பரிசுகளை வழங்கினார்.

ஸ்ரீ ராதாகல்யாண மஹேந்திரசுவம் :

கெமிகல்ஸ் பஜனை சமாஜத்தின் மார் கழி மாத கிரிபரதக்ஷிண பஜனையை ஒட்டி ஸ்ரீ ராதாகல்யாண வைபவத்தை 1954 ஜனவரி மாதம் 3-ம் தேதியன்று சிறப்பாக கொண்டாடினர். இவ்விழாவில் மேட்டூர், சேலம் காம்பி, மற்றும் சேலம் ஜில்லாவிலுள்ள பல இடங்களிலிருந்தும் பக்தர்கள் வந்து கலந்து கொண்டனர்.

பாதிக்கவல்லது. உதாரணம் : ஹைட்ரோக்ளோரிக் அமிலம். இதற்குத் தகுந்த முகமுடி போட்டுக்கொள்ளுவதால் கண்களை மட்டுமின்றி, முகம் சுவாச உறுப்புக்கள் முதலியவற்றையும் காப்பாற்றிக் கொள்ளலாம். 'வெல்டிங்' வேலையில் ஈடுபட்டிருப்பவர்களின் கண்களை "அல்ட்ராவயலெட்" கிரணங்கள் தாக்கலாம். இவற்றிற்கு பாதுகாப்பாக கண்ணாடிகளோ, கண்ணாடி பொருத்தப்பட்ட தடுப்போ, உபயோகப்படுத்தப் படுகிறது.

விபத்து வருமுன் காப்பதே சிறந்தது. முன் ஜாக்கிரதையாக இருந்து கண்களுக்கு அபாயம் நேரிடாமல் பார்த்துக் கொள்வதின் அவசியத்தை எவ்வளவு வற்புறுத்தினாலும் தரும். ஆபத்து நேராவண்ணம் நிர்வாகமும் தொழிலாளியும் ஒத்துழைத்தல் அவசியம். தற்காப்பு வசதிகள் அளித்து, அவற்றை உபயோகப்படுத்துவதின் அவசியத்தை எடுத்துரைப்பது நிர்வாகிகளின் கடமை. தொழிலாளிகளும் பாதுகாப்பு விஷயங்களில் அலட்சியமாகவோ அஜாக்கிரதையாகவோ, முறைப்படி செய்யும் வேலைக் கிரமத்திலிருந்து பிறழ்தலோ கூடாது. வேலை செய்யும்பொழுது, கண்ணாடிகளை

கழுத்தில் தொங்கப்போட்டுக் கொள்ளுவதும், நெற்றியின்மேல் மாட்டிக் கொள்ளுவதும், சௌகரியமாக இருப்பதுபோல்தோன்றினாலும் துரதிருஷ்டவசமாக விபத்துக்கள் ஏற்பட்ட பின்னர் தான் 'ஐயோ, பாதுகாப்பை அணிந்து கொள்ளாமல் போனோமே' என்ற அங்கலாய்ப்புத் தோன்றும்.

விபத்து வந்தபின் என்ன செய்ய வேண்டுமென்பதையும் சற்று கவனிப்போம். முதலாவதாக கண்களை சுத்தமான தண்ணீரில் கழுவவேண்டும். குறைந்தது 15 நிமிஷத்திற்காவது இப்படிச் செய்து, பிறகு இரண்டு கண்களுக்கும் ஒவ்வொரு சொட்டு 'ஆர்ஜிரால்' (Argyrol) என்னும் மருந்தை உபயோகித்தல் நலம். பிறகு டாக்டரிடம் அனுப்பி அவர் அவசியமென்று கருதினால் கண் டாக்டரிடம் விபத்துக்குள்ளானவரை சோதனைக்கு அனுப்ப வேண்டும்.

முக்கியமாக எந்தக் காரணத்தை முன்னிட்டும் கண்களை கசக்கவோ, அல்லது அசுத்தமான துணியினால் துடைத்தலோ கூடாது.

மெட்கம் செய்திகள்

பகவத்கீத உபந்யாஸம் :

நூரணி மஹாமஹோபாத்யாய ஸ்ரீ அனந்தகிருஷ்ண சாஸ்திரிகள் அவர்களால் செப்டம்பர் 28-உ முதல் அக்டோபர் 4-உ வரை கெமிகல் காலனியில் ஸ்ரீமத் பகவத்கீத உபந்யாஸங்கள் 15 டைபெற்றன. உபந்யாஸத்தின் ஸமாப்தியை முன்னிட்டு அக்டோபர் 4ம் தேதியன்று புருஷஸூக்த மஹாயக்ஞம், லக்ஷார்ச்சனை முதலியன சிறப்பாக நடத்தப்பட்டன.



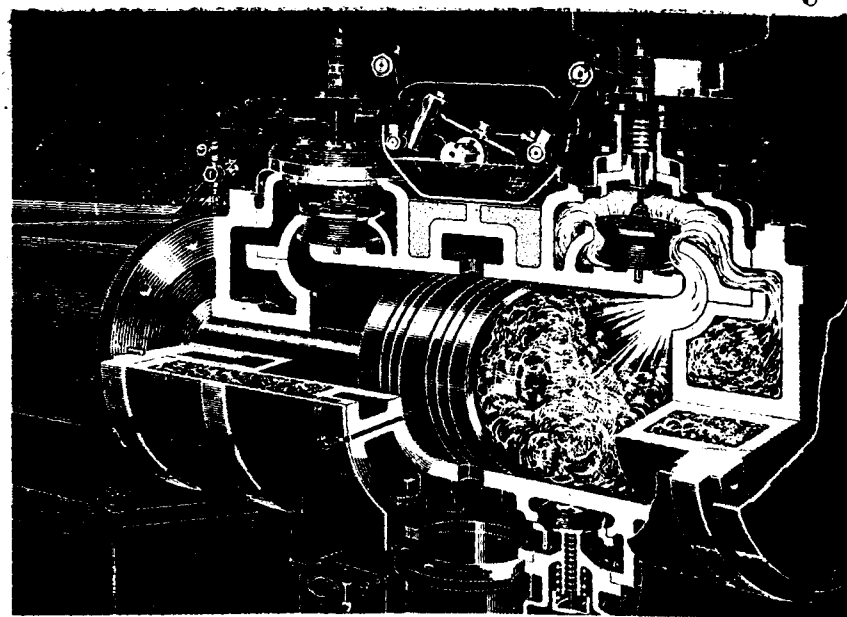
புருஷஸூக்த மஹாயக்ஞம் : வனோத்தாரை

உடற்பயிற்சிசாலை ஆண்டுவிழா :

பீம உடற்பயிற்சிசாலையின் இரண்டாவது ஆண்டுவிழா கெமிகல் காலனியில் அக்டோபர் 16-ம் தேதியன்று சிறப்பாக நடத்தப்பட்டது, அன்று காலை 8 மணிக்கு உடற்பயிற்சிசாலையில் பூஜை நடந்தது. அன்று மாலை கிரிக்கட் மைதானத்தில் பயிற்சிசாலையின் மாணவர்கள் சில உடற்பயிற்சிகளைச் செய்தனர். பின்னர் தென் இந்தியா உடல் அழகு சாம்பியன் ஸ்ரீ K. V. திருமலை பளு தூக்குதல் போன்ற சிலவற்றைச் செய்து காண்பித்தார். தென் இந்தியா சாம்பியன் ஸ்ரீ M. A. பாலு அவர்கள் 'ரிங்ஸ்' வேலைகளும், ஆசனப்பயிற்சியும் செய்துகாண்பித்தார். பீம உடற்பயிற்சிசாலையின் ஆசிரியர் ஸ்ரீ J. ஆறுமுகம் அவர்களின் வந்தோடுபசாரத்துடன் ஆண்டுவிழா இனிது முடிந்தது.



நூரணி மஹாமஹோபாத்யாய ஸ்ரீ அனந்தகிருஷ்ண சாஸ்திரிகள்.



How we mix oil and water ..for better lubrication !

The cylinder of a steam engine is a tough lubrication problem. The reason is that some of the steam nearly always condenses on the cylinder walls, washing off the lubricating oil, and increasing the risk of wear.

The washed-off oil could, perhaps, be replaced by increasing the oil supply to the cylinder. However, this would greatly increase the consumption of oil. Worse still, in a condensing engine the exhaust steam returns to the boiler as feed water; and if too much oil is fed to the cylinder, it may contaminate the feed water and cause boiler failure.

Experience finds the answer

As usual, the makers of Gargoyle Steam Cylinder Oils have an answer to the problem. To resist the washing effect of the condensing steam, they force it to *combine* with the oil in an emulsion.

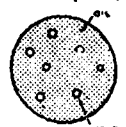
Thanks to careful control in manufacture, this emulsion has greater adhesiveness and film strength, to give full continuous lubrication. Moreover, the oil supply to the cylinder can be considerably reduced; so much so, that the exhaust and feed water may actually be contaminated *less* than by a non-emulsifying oil.

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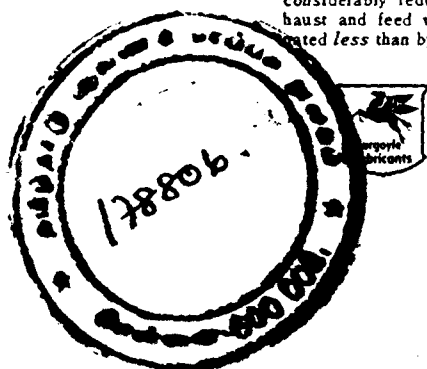
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Attention—Electrical Engineers

Much ink has recently been spilt in the technical Press both in the U. S. A., and on the Continent, about the available designs of aluminium to copper connectors, and their suitability for what they are called upon to do. Manufacturers of standard aluminium cable accessories, however, noticed with dismay, that complaints largely came from sources where information was totally inadequate for a full appraisal of results. In several cases, it was found that aluminium-copper fittings of the most unsatisfactory kind had been used. In the U. K., they use bimetallic junctions—kept dry by an insulating washer. It is desirable that aluminium-copper contacts are kept moisture-free by embedding them in some durable grease. Faults are not inherent in the aluminium conductor—these largely lie in the fittings used which, more often than not, are either improperly designed or crudely improvised.

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