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Journal

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METKEM Journal

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In this Issue

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Cover Photo

Mr. S. Ramaswamy, Production Superintendent, MCIC with Dr. Hermann Goez, Director BAO, Berlin. Mr. Ramaswamy recently returned from an extensive tour of West Germany and the continent.

...ION OF SMALL INDUSTRIES

...ELOPMENT of small-scale ... which forms an important aspect of the Community Project Programme is expected to receive an impetus as a result of the several decisions taken recently by the Community Projects Administration in consultation with the Ministry of Commerce and Industry and the All-India Khadi and Village Industries Board. These decisions aim at the promotion of small industries in community project areas on scientific lines having in view the requirements of a changing market. The programme, it is learnt, will be worked in an integrated way with direct participation of the Central Ministry of Community Projects and the All-India Khadi and Village Industries Board.

As our readers may be aware, Community Programme, wherever it has been launched, includes promotion of any industry, other than large and medium-scale industries subject to the availability of local raw material, tools and marketing facilities. For a development block consisting of about 100 villages, the allotment for small industries will be about Rs. 1·25 lakhs out of Rs. 15 lakhs of the total budget. It would appear, however, that it has not fully been possible to implement this part of the programme in many areas on account of the difficulties that project workers encounter in sponsoring a suitable cottage industry programme which will steer clear of competition from large-scale industries.

Mr. Remy Alexander, a member of the International Planning Team on Small-Scale Industries in India, sponsored by the Ford Foundation brought out the core of the problem of small industries in India when he said :

"Here is a multitude of men whose livelihood depends on a market changing under their eyes—their own village—while they are unable to foresee the impact of the change and are unaccustomed to planning in general. Some of their opportunities lie in the city, and in the foreign market, of which they know nothing. Their future depends not on simple improvements in the practice of their trade, but on their ability to produce well-studied, sometimes entirely new, objects designed to meet very specific requirements, different from place to place, from one class to the next."

Mr. Alexander has, also, suggested that at every block centre specialists with experience in production, and those who would be able to make an accurate appraisal of the difficulties and prospects of work of the village craftsmen should be available for giving general guidance and assistance. In addition, he says, there should be a Central co-ordinating unit which would keep in constant touch with the existing specialised Institutes, with the four regional Institutes of Technology for Small Industries which are proposed to be set up by the Ministry of Commerce and Industry, and with any other public or private organisation that could supply information to or advice required by the craftsmen. In any programme of assistance, Mr. Alexander remarks, basic opportunities should be offered to all, but special encouragement should be given with discretion: in one form to a craftsman who has the making of a businessman, in a different form to another who has outstanding talent in his craft but none for business.

Another proposal which the Commerce and Industry Ministry is actively considering at present in consultation with the Community Projects Administration relates to a scheme to establish experimental diesel generator sets in selected community project areas with a view to encouraging the use of electric power by small industries and for making such power available to them. The Ministry also proposes to constitute Regional Advisory Board for each of the Institutes and in such Boards each State is expected to be represented by two officers, one of whom might be directly concerned with the community project work in the State.

The Community Projects Administration has also taken some welcome steps to co-ordinate the small industries programme in the projects areas with the activities of the All-India Khadi and Village Industries Board.

Among the decisions taken are:

(a) the Board would give preference as far as possible to community project areas while expanding its work;

(b) loans would be given to craftsmen; subsidies would be given in deserving cases

These decisions are expected to be put into operation shortly.

Instrumental Methods of Analysis in Caustic-Chlorine Industries *

by

M. PADMANABHAN, B. Sc., Senior Chemist.

...ther industry there has ...t and ... keen demand for better ...s oper... rapid methods of analysis ...or over... ...ew or improved analytical des...n ...uments therefor in the caustic-...lorine industry. For analyses which are performed regularly, better results are found possible with the use of unitized apparatus for every specific analysis. The assembly of all the required components into a compact, integrated unit provides for better control of conditions, facilitates multiple determinations and tends to improve precision and accuracy, and to decrease time and space requirements. And as in industry, in the field of chemical analysis also, instrumentation is playing an increasingly important role.

This paper proposes to deal with some of the instruments commonly employed in chlor-alkali industries for chemical analysis.

1. *Moisture determination in Bleaching powder :* Moisture is most commonly determined as the loss in weight of a material dried in an air-oven at a temperature slightly above the boiling point of water or in case of heat-sensitive materials, in a vacuum-oven and at a lower temperature. Although oven-drying methods are satisfactory for many materials, organic or inorganic, they are totally unsatisfactory for many materials which contain volatile materials other than water or are heat-liable. Attempts have been made to determine moisture in such cases by physical means, such as conductivity and capacity, but these methods will have to be standardised or calibrated against another method or procedure before they can be put

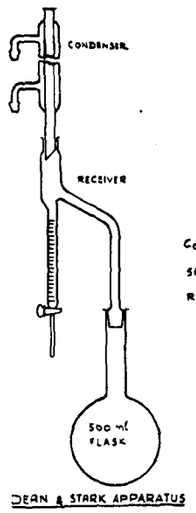
* Being a paper presented at the Symposium on 'Instrumental Methods of Analysis' during the second annual convention of the Indian Association of Analysis and Analytical Chemists, held at Hyderabad (Dn.) in December, 1953.

to use. And the need for a standard reference or an absolute and independent method is satisfied by distillation procedures which are found to be good for the determination of true moisture.

Principle of the distillation procedure: The sample under test is distilled with an excess of a liquid which has a boiling point higher than water and is immiscible with it. Heat is applied to the mass. Water and liquid are distilled off, the excess liquid as vapour removing the last traces of water and driving it from the boiling flask. The combined vapours are condensed and collected, and the separated water is measured.

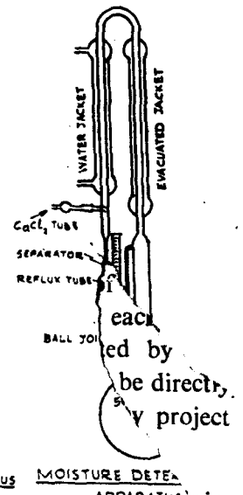
In its simplest form, the distillation apparatus consists of a boiling flask for the sample and boiling liquid, a condenser for condensing both the water and the liquid, and a trap which collects and measures the liberated water. The trap is so constructed that the condensing liquid flows back into the boiling flask. The condenser functions as a refluxing unit, enabling the last traces of moisture to be removed from the sample and the excess of distilled liquid to wash those traces of water into the measuring trap.

Fig. 1 shows the trap arrangement for the use of a distilling liquid which



DEAN & STARK APPARATUS

Fig. 1



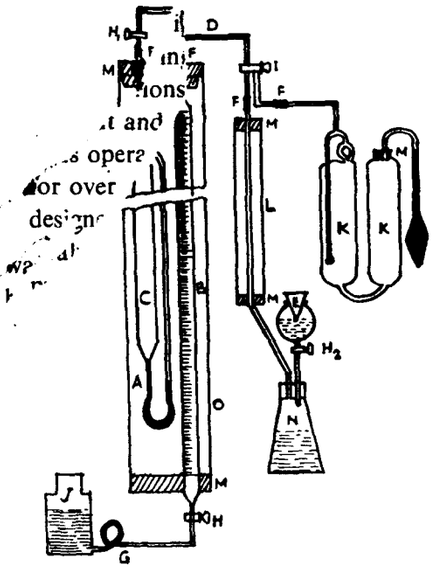
MOISTURE DETE… APPARATUS

Fig. 2

is lighter than water, for example xylene—sp. gr. 0·88 boilling point 142 deg. C. The trap contains a calibrated tube, sealed at the bottom and calibrated upwards from the end, with a small liquid reservoir above the calibrated portion.

To eliminate the hazard of using flammable liquids like xylene, non-flammable liquids such as ortho-dichlorobenzene sp. gr. 1·305, boiling point 178 to 180·5 deg. C—could be used. But the use of these liquids necessitates a different type of trap as shown in Fig. 2, because it is heavier than water. Here the collected water remains on the liquid and the liquid must be withdrawn from beneath the

collected water and returned to the boiling flask. The trap is calibrated downward from the top. As thorough mixing of the water and the distilling liquid happens all through the period of distillation, at times an emulsion is formed at the trap, difficult to break, and making it impossible for the clear separation of the water.



CO_2 DETERMINATION APPARATUS

Fig. 3

A. Drop of water above mercury in Manometer; B. 100 ml. Gas burette; C. Compensator tube; D. Capillary tubing; E. Funnel for introducing acid; F. Strong rubber connections; G. Rubber tubes; H. H_1 & H_2 – Two-way Glass Stop Cocks; I. Three-way Cock; J. 500 ml. Levelling bottle connected by rubber tubing 'G'; K. Caustic potash pipette; L. Condenser; M. Rubber stoppers; N. Receptacle for sample; O. Water jacket enclosing 'B' & 'C'.

As the boiling liquid carries th heat effectively and rapidly to all particles of the sample, the water is removed quickly. Because the test is made in an inert atmosphere, all dangers of oxidation of the sample by air are eliminated. Even though these considerations may be claimed to be the chief advantages of the distillation method, there has been a failure to take into consideration some special techniques required for the materials under test, just as the emulsion formation experienced in the determination of moisture in bleaching powder using ortho-dichlorobenzene. Further, in practice, it is found difficult to get the trap and condenser clean and dry for the next experiment after one experiment is over. They will have to be cleaned with some detergents and a long stemmed brush and allowed to stand. In order to do this, it is necessary to carry several extra interchangeable traps and condensers.

2. *Carbon-di-oxide determination in lime products:* The assembly recommended by the Solvay Process Company is successfully used for the determination of carbon-dioxide in burnt lime, hydrated lime and limestone samples by gas evolution and absorption method. The instrument is shown in Fig. 3.

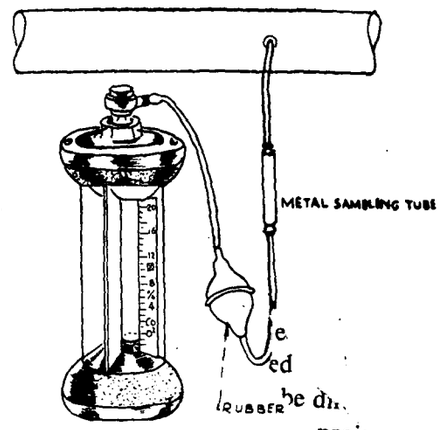
Operation: Initially, the mercury columns in the compensator tube are

levelled. The sample is placed in the receptacle N and concentrated hydrochloric acid is dropped from the funnel E and the contents boiled. The liberated gas is collected in the burette and measured, keeping the water level in the burette same as in the levelling bottle and also keeping the two mercury columns level. Then the liberated gas is absorbed in the potash pipette K and the residual gas volume noted as before.

The difference between the two burette readings, multiplied by a factor, gives the weight of carbon-di-oxide present in the sample. The factor is already determined by a series of actual tests on a sample of known carbon-di-oxide content, say, chemically pure sodium carbonate.

This is a satisfactory method for the determination of small amounts of carbonate and the time required for a test is from 5 to 10 minutes after the sample is taken in the apparatus.

3. *Determination of carbon-di-oxide in flue gases*: The use of a compact and portable instrument is described in a recent issue of *The Laboratory* published by the Fisher Scientific Company for the determination of carbon-di-oxide in flue gases of all types of boilers, lime kilns, etc. The instrument is shown in Fig. 4.



PORTABLE CO_2 INDICATOR

Fig. 4

To use the instrument, the metal sampling tube at one end of the rubber hose is inserted into the gas source, and the plug at the other end of the hose is pressed down on a valve which opens a passage into the instrument. Next the sample is pumped into the indicator by means of a rubber bulb. Lifting a finger from the plug releases pressure, sealing the instrument. The instrument is then given a shake to mix the sample with the absorbing fluid, which is a chemical solution possessing a special affinity for carbon-di-oxide. Absorption of the carbon-di-oxide creates suction, thus drawing the fluid up into the centre tube and giving a direct reading. The entire test takes under a minute and is not subject to errors of calculation.

4. *Chlorine analysis:* The chemical methods of determining chlorine concentration in process gases are laborious, and yet they yield only spot checks on the condition of a chlorination operation. Mr J. F. Arbogast and Mr. R. H. Osborn of Hercules Experiment Station, Hercules Powder Co., Wilmington, Del., claim to have designed an instrument for continuously analysing and recording chlorine concentrations between 0 and 100 per cent and it is said to be in continuous operation on a plant chlorinator for over two years. The instrument designed is based on photometric analysis as it makes use of a unique property of chlorine not shared by any of the other gases present in the reaction. That is its greenish-yellow colour while other gases normally present in process gas are colourless.

It is hoped that ere long the chlor-alkali industries in our country will be able to instal such instruments in their works and achieve better quality control.

5. *Common salt analysis:* A noteworthy application of instruments is made in the analysis of common salt to determine whether it conforms to the prescribed Indian Standards Institution Specification. The ordinary chemical analysis of water insolubles, calcium, magnesium and sulphate is an elaborate, time-consuming process. In its place, the National Chemical Laboratory, Poona, has recommended the centrifuge method. The set-up of the assembly consists in the main of a hand centrifuge with graduated centrifuge tubes. The method consists in the physical comparison against a standard, of the amounts of barium sulphates and the combined calcium and magnesium phosphate precipitates obtained from a known aliquot of a clear salt solution which is centrifuged after the addition of the necessary reagents.

This is a quick and approximate method for the assay of common salt easy of adoption by small scale salt, manufacturers, doing away with elaborate laboratory equipment and highly-trained personnel.

6. *Hydrogen analysis*: Gas mixtures are analysed by means of thermal conductivity. The katharometer supplied by Cambridge Instruments Co, London, for determining the percentage of hydrogen in the gas evolving from the electrolysers is one such instrument which employs this principle. It consists in measuring the change in resistance of a heated platinum wire through the surrounding atmosphere of the test gas. A pair of thermal conductivity cells is connected to a wheatstone network. One cell

contains the test gas, and the other the standard gas whose conductivity is known. The resistance of the other cell is directly measured and amplified.

This type of instrument is highly sensitive when used under proper conditions. The test gas pressure at the meter for the instrument in use at the Mettur factory should not differ from atmospheric pressure by more than about 2 cms. mercury. Further the gas must be dry as water vapour is registered as an impurity. And a cotton wool filter must be used between the meter and gas supply to arrest dust. The gas flow rate is to be kept at 100 ccs. per minute.

7. *pH Measurement* :—Control of pH is of great importance in the operation of chlorine electrolysers. The brine feed to the cells should conform to a certain pH to obtain best results. Further by a determination of the pH of anolyte taken from a chlorine-caustic diaphragm cell (Hooker 'S') using a glass electrode and a reliable pH meter-namely, Beckmann No. 2000-Model G or the Beckmann N. 5000-Model M, the current efficiency of the cell could be arrived at immediately by a reference to the empirically-established curves. The pH method is rapid, easy to use and gives fairly accurate results. It provides a simpler means of locating inefficient cells in a circuit.

It is essential that instruments which are so helpful to the analytical chemists and the chemical industry at large be kept in as perfect a condition as possible. Periodic inspections and careful and proper maintenance are a pre-requisite to satisfactory operations. When it is not in working order, a precision laboratory instrument is worse than useless. Such an instrument should be got repaired and recalibrated as quickly as possible so as to ensure correct results always.

References:

1. Analytical Chemistry
Vol. 23, No. 27 ; Vol. 23, No. 6

2. Solvay Technical and Engineering Service Bulletin No. 10.

3. The Laboratory—Vol. 21, No. 1.

Some Chemical !

Harvard's late famed Philosopher-Mathematician Alfred North Whitehead was far from the conventional absent-minded professor, but he did have occasional verbal lapses. One day he was cautioning a student about a theory of logic. "You must take it with a grain of er . . . um . . . ah . . . For almost a minute, Whitehead groped for the word, until the student suggested, "Salt, Professor ?"

"Ah, yes," Whitehead beamed. "I knew it was some chemical."

EXCURSION TO NEIVELI

A party of us—Members of the Society of Technologists—left Mettur on June 19, to visit Neiveli, in South Arcot District, to see for ourselves the mining operations in progress at the pilot lignite quarry.

Arriving at Vriddachalam Junction at 12-30 a. m., we spent the rest of the night in the waiting room. In the morning, after a refreshing shower, we had our *chota* in the Vegetarian Refreshment Room. The *ghee* served was so unbelievably good that a member of our party was tempted to ask whether good *nei* (ghee) was available at Neiveli!

Taking the train which leaves Vriddachalam at 7 a. m., we arrived at Neiveli at 7-35 a. m. We footed it from the station to the Lignite Investigation Office, which was not very far, and from there, we went to the pilot quarry, a distance of a mile or so, from the office. Here we met Mr. H. K. Ghose, the Officer-in-charge. He was kind enough to depute Mr. I. V. Majumdar, Assistant Manager, to show us round.

Members of the SOT excursion party posing from behind an artesian well.

The first object of our inspection was a model of the quarry which gave us a general idea of the pilot quarry with the different strata of soil above the bed of lignite. We were then shown the third experimental pit near by, which had been dug to a depth of 250 feet. A considerable quantity of lignite had been mined for laboratory and pilot plant experiments.

The sight of giant shovels, bull dozers and dumpers in action, at the pilot quarry was quite impressive. Another "moving" sight was giant trucks carting away the excavated clay through circular roadways to a place farther off where a mound of white or light pink clay could be seen rising. We saw the pilot quarry of 500 feet square dug to a depth sloping to about 70 feet in the centre, and the "benches" and the layers of clay on the edges.

Next, we visited the workshop attached to the Project where spare parts for all the equipment used in the drilling and other operations were

being made. We then proceeded to the laboratory attached to the Project where Dr. C. V. S. Ratnam, Member, Lignite Investigation, showed us samples of lignite and clays mined from the experimental pit, and samples of lignite briquettes, carbonised briquettes, tar and pitch produced in the laboratory. Dr. Ratnam explained to us the processes involved in the preparation of the samples and the potentialities of the Neiveli Project.

We rounded off our visit to Neiveli with a trip to an artesian well in the locality, thanks to transport arranged by Mr. V. Subramaniam, Junior Engineer, Neiveli Project. The well was like a fountain, the water gushing upwards continously, with a characteristic sulphur smell. We were told that there were about 170 of these wells in the area, irrigating over 5,000 acres of land.

Members of the party then, posed for a "group" standing on the parapet around the artesian well—that is, all excepting Mr. K. Ramnath, our Works Manager, who walked out on us to clamber up to the top of a waiting lorry—he was our official photographer and would sooner miss himself in a "group" than miss the chance "shoot us"!

On the upward journey, we formed ourselves into two sets of card players, and played out the entire travel time which was nearly as much as the duration of our excursion. Welcome interruptions to the games were provided by our friend and fellow-traveller, Mr. V. R. P. Ramanathan, Distributor, Salem, who would not take "No" for an answer to his repeated offers—or should we say "offerings" of fruit. *Nadusalai* mangoes, *Satukudi* oranges and hill plantains constituted the range, but, then, why mention it all and drive home piognantly what the others missed!

In closing, we would like to record our grateful thanks to Mr. H. K. Ghose and his assistants, to Mr. Selvaraj, Mechanic (formerly of MCIC), to Mr. V. Subramanian, of the Neiveli Project and Mr. V. R. P. Ramanathan for all the kindness and courtesies we received.

K. Ramanath was, of course, the life and soul of the party, and to him also our thanks are due for making the trip a really enjoyable one.

To Mr. S. Ramaswamy, (President) again, we owe thanks, particularly for painting (for our delectation) an extremely rosy—or is it brown—picture of the shape of things to come at and around Neiveli in the not-too-distant future.

—C. S. SRINIVASAN.

A view of the pilot lignite mining quarry at Neiveli

The structure above the experimental pit from which the first pieces of lignite were quarried at Neiveli.

Reviews

THE ECONOMICS OF CHEMICAL PRODUCTION: By A. K. MADAN (The Scientific and Technical Publications, Bombay.)

THE problem of industrial planning for chemical production might have been solved from a technical standpoint, but that is far from enough. In order that production might be stabilised and expanded, certain ancillary issues have also to be found satisfactory answers. Factors like the laws of supply and demand, markets, present and past sources of supplies of chemicals, price trends, present and potential consumer industries—all enter into the ultimate success of the industry.

This book is a sincere attempt at understanding some of the complex issues involved in the chemical industry. Much original research and much new thinking have gone into it.

The author first traces the history of the chemical industry in the country, then takes us through its growth and recent development, and after discussing the future prospects of the industry, proceeds to deal in detail with its technical and economic aspects.

The various difficulties that confront manufacturers are well—and sympathetically—brought out. The author has done well to stress the need for relief to the industry in matters like freight concessions, tariffs, financial aid, economic policy, etc. The

(*Continued in Col. 1*)

exhortation is also made to manufacturers that they should strive to turn out better products.

The value of this well-written book is further enhanced by the exhaustive statistical data that it contains about production, exports and imports, freight rates, etc. —T. S. SUBBA RAO.

Miscellany

Society of Technologists. The power plants in the aeroplane, the jet plane, and rockets, and the factors that contribute to greater and greater efficiency in the aeroplane were some of the aspects dealt with by Prof. G. B. Pant of the Indian Air Force in a popular lecture on 'Aircraft Propulsion including Jets and Rockets' which he delivered under the auspices of the Society on February 13.

On April 29, the Society met to hear Mr. S. Ramaswamy, Production Superintendent, about his recent trip to Germany. Mr. K. K. Raman was in the chair. Before the proceedings commenced, members observed silence for two minutes in memory of the late Mr. V. Ramamurthy, Joint Secretary of the Society for the year.

Mr. Ramaswamy gave brief descriptions of the several factories that he had visited in Germany and also dealt with the aspects of the industry he had taken up for detailed study. He drew particular attention to the great improvements that had been made in the chlor-alkali industries in Germany.

Concluding, Mr. Ramaswamy discussed the possible new lines of development for MCIC, such as the manufacture of ferric chloride, polyvinyl chloride, etc., and of sodium chlorate by electrolysis.

A lively discussion ensued.

On May 19, Dr. M. Narasinga Rao of the Department of Chemical Technology, Andhra University, Waltair, addressed the Society. Mr. A. R. Narayanan presided.

In the course of an interesting lecture, Dr. Rao stressed the need for the development of industries for the progress of our country and discussed the present position of several industries *vis-a-vis* scientific research. Many factories were not developing on the right lines, he said. He was of the view that scientific research done in the country was not being applied commercially. The lecturer also said that there were some links which had to be traced and set right, if development schemes were to succeed.

Sales Conference at Mettur Dam.

Weddings: We extend our congratulations and good wishes to the following newly-weds:

M. Krishnamurthy (*Typist*) and Miss Lalitha.

N. G. Govindan (*Operator*) and Miss Sarathambal.

Govindaswami Pillai and Savithri (daughter of N. S. Manickam Pillai of Mettur Chemicals, Coop. Stores.)

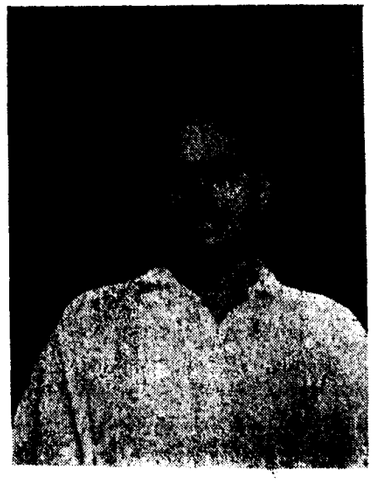
Our very good wishes also go to:

Venkatasubramanian, nephew of D. Rajam of Accounts Section and D. Lakshminarayanan, son of S. Kalyanaramier, Estimator, MCIC whose *upanayanams* were recently celebrated.

Our best wishes also go to S. Balasubramaniam, son of N. Sundaresan whose *upanayanam* came off on May 7. The lunch in the afternoon and the dance recital in the evening by Kumari (Baby) Sumathi, Mr. Sundaresan's eleven-year old daughter, were both well-attended.

The dance recital was as good as that of a professional artiste. Full praise is due to Sri Muthaiah Pillai of Pandanallur and Srimathi Kamalambal of Tanjore on the excellent training they had imparted to an apt pupil. At the close of the performance, Mr. S. Ramaswamy presented a cup to the young dancer.

Excursion to Tiruchi: Forty pupils and six teachers of the Chemicals Secondary School under the leadership of Mr. A. Srinivasaraghavan, Headmaster went on an educational excursion to Tiruchi. They visited various places of interest and importance including the Rock Fort, the A.I.R. Station, Aerodrome, St. Joseph's College and the temples at Srirangam and Thiruvanaikovil.



C. R. Radhakrishnan who resigned recently to join the Integral Coach Factory.

Mr. V. Seshasayee and Mrs. Seshasayee provided them with tea and sweets when the party visited their residence. Mrs. Raman also entertained them to light refreshments when they visited her place. After a pleasant tour, the party returned to Mettur on March 1.

Chemicals School Day: The first "School Day" of the Chemicals Secondary School was celebrated on April 25. Mr. K. K. Raman, Director, Managing Agents, presided. Mrs. Akhila Raman gave away the prizes to the winners in the various sports tournaments.

The students later presented scenes from Shakespeare's *Merchant of Venice* and also regaled a thoroughly appreciative audience with a mock Kalakshepam and *Vatsala Kalyanam* in Tamil.

K. S. S. Mani, Welder.

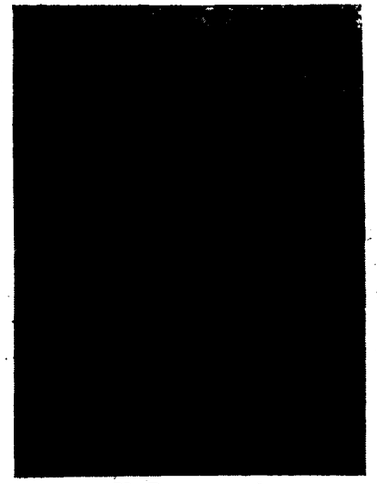
Farewells: C. R. Radhakrishnan, Junior Engineer, left us recently to join the Integral Coach Factory, Perambur as a Chargeman. The Staff Association met him at a farewell dinner on June 9. T.S. Subba Rao, N. Kalyanam, S. Ramamurthi (A.E.) made felicitatory speeches after dinner.

We wish Radhakrishnan every success in his new appointment.

Sales Conference: A conference of distributors of MCIC and officials of the sales section was held at Mettur Dam on March 21. Issues of interest to the manufacturer, the distributor and the consumer were discussed. Some helpful suggestions were put forward by the distributors.

Special Training in Welding: K.S.S. Mani, Welder, recently underwent special training in low temperature welding at the works of Messrs. Larsen and Toubro, Madras, and in metal spraying and fusion welding of mild steel sheets and monel pipes at the S. T. S. Welding School of the Indian Oxygen and Acetylene Co. Ltd., Calcutta.

Pictures: Films shown in recent months included :



V. Ramamurthy.

On an Island with you; Mildred Pierce; Air Raid Warden; A Southern Yankee; Jezebel; That Midnight Kiss; Bridging The Golden Gate.
Cleanliness Brings Health; Swimming and Diving Aces; Lone Star, Neptune's Daughter; Junior College for Technical Trade; Everyone's Empire and *Mechanic.*

Obituary: In recent months, we mourned the deaths of five members of staff. To the bereaved families, we tender heart-felt sympathy.

V. Ramamurthy, *Chemist.*

S. Subramania Iyer, *Maistry, Civil Section.*

V. Sekharan Nair, *Supervisor.*

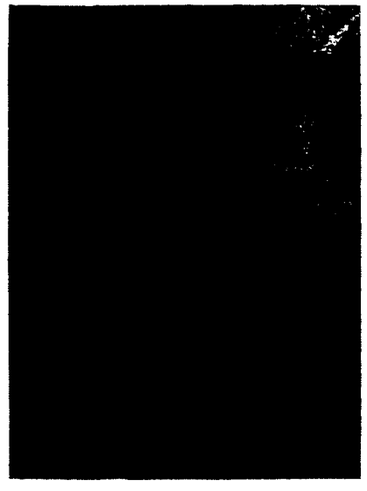
B. S. Balachandran, *Accounts Section.*

S. Marisusai, *Fitter-mate, Workshop.*

Mr. Ramamurthy joined our company as a Chemist in 1943. Deeply devoted to his work, duty was always his concern, even outside his normal working hours. Kind and warm-hearted, he often gave liberally to all deserving causes. As the Hon. Treasurer of the Staff Association and the Joint Secretary of the Society of Technologists, he did much excellent work.

Ramamurthy's death in February this year was so swift and so sudden that even the passage of time has not served to reconcile us to the inexorable fact of his death.

S. Subramania Iyer, known more familiarly in the colony by his *alias* "Suravali", and whose death occurred on May 10, had been with MCIC



S. Subramania Iyer.

since its inception. Good "housekeeping" was with "Suravali" a consuming passion. The task of keeping the factory and the colony neat and tidy could not have been in better hands—he toiled from dawn to dusk, in rain and shine, absorbed in his mission of cleanliness.

"Suravali" was equally lovable off duty, as well. In the now-happily forgotten ration era, it was to him that we turned for our cards and things.

V. S. Nair, whose death took place after a short illness, on May 14, was rather a quiet sort. On duty, he seldom left the work-spot; off it, he seldom left his quarters, except may be, for a brief visit to the Clubhouse. It is a great pity he died even before we got to known him well enough.

Death occurred of B. S. Balachandran on May 24. Prior to joining us in 1951, he was with the South Madras Electric Supply Corporation, Limited, Tiruchi. He was, also, a rather reserved type.

After a long illness patiently borne, Mariasusai died on June 6. A very fine worker, we will badly miss him.

SINGMASTER AND BREYER

PRIDEFULLY, Singmaster & Breyer, New York Engineering firm, has just seen five plants it designed come on stream in less than two months. Spreading themselves over three continents, S & B also managed or supervised the construction of all five.

Built in this country (U. S.) were a phosphoric acid plant for Smith-Douglass Co., Streator, III., Stauffer Chemical's carbon tetrachloride plant at Louis ville, Ky., and zinc roasting and acid facilities for Sullivan Mining Co., Kellogg, Idaho. Overseas operations are a vertical zinc retort, Mitsui Mining & Smelting Co., Ltd., Omuta City, Japan, and an ammonium nitrate installation for the Fertilizer Plant, Inc., Reykjavik, Iceland.

Considerable interest has been shown around industry in both the phosphoric acid and ammonium nitrate plants. The former is the first in the U. S. to use the Belgian Prayon process.

Guaranteed to give a 95 per cent yield—based on P_2O_5 entering—the Prayon process controls the leach system temperature by evaporative cooling. In addition, the entire plant requires only one filter—a new Prayon horizontal type whose revolving trays overturn to dump the filter cake. Just three days were needed to bring the plant up to full capacity production.

Key to the 18,200 metric-ton-per-year ammonium nitrate plant in Iceland is its continuous, two-stage crystallization system that yields true crystals, not granules or dust. And little or no outside heat is required.

—Chemical Engineering

Cricket: Because space had to be found for Staff Day Tourneys, accounts of the matches played against outside teams in recent months could not be included in the last issue. Although, at the present time, much of the topicality is lost, brief reports are still given so as to maintain continuity.

Playing against the Thiagaraya College, Madras, on our grounds on December 27, we lost the match by 3 wickets.

Batting first, our side was out for a moderate total of 133. N. Kalyanam (26) and N. Narayana Rao (23) were our chief scorers. For the visitors, P. R. Padmanabhan took 3 wickets for 41 runs.

The Collegians were able to pass our total for the loss of 7 wickets, thanks to our bowling which lacked sting. Venkatraman and Gurusamy scored 39 each. T. S. Subba Rao took 2 for 8.

Our old rivals, the Salem Cricket Club, beat us by 4 wickets in a match played here on January 10. Facing a formidable battery of good bowlers, we piled up the sizable enough total of 178 runs, but it was of no avail. Both K. R. Ramakrishnan (44) and N. Kalyanam (42) played a grand innings. This match served to unearth new opening batting talent in the person of T. Anthony; he played a resolute and confident innings for his 29. Palaniappan claimed 4 for 34. The Salem Club went about its job of collecting runs in aggressive fashion. K. N. Venkatachari, (the veteran cricketer of Salem, Madras and Mahrashtra and one of the finest fieldsmen going in the country to-day) who was playing for the visitors, knocked off a breezy 44. R. T. Parthasarathy scored 39 and the youngster Iqbal 34. Our total was passed for the loss of 6 wickets. Under the steady onslaught of the visiting batsmen, our bowlers lost their initial grip, each over fetching 9 runs on an average.

The seemingly perennial run of our failures was broken when we beat the Railway Institute, Salem, on January 19. We won the match by the comfortable margin of 54 runs.

Put in to bat after losing the toss, our players were all out for 114 due, in the main, to some steady bowling by Mani, Vijay and Ramaswamy who tooks 4 wickets each. R.G. Raghavan's innings of 29 n. o. was timely. T. D. K. Sami and Anthony contributed 21 runs each.

The Institute batsmen found the deliveries of N. Jayaraman too hot for their liking. In a deadly spell, he took 6 wickets for 25 runs, clean bowling

4 victims, and having 2 out for leg before. N. Narayana Rao ably assisting him, (4 for 14) we shot our opponents out for a mere 60.

Our first outside match for the season was the return fixture we had with the Salem Cricket Club, at the Little Flower High School Grounds, Salem, on January 24, which we again lost by 80 runs.

Batting first, the Salem Club ran up the high total of 203 runs. Nagarajan played steadily for his 66 runs. D. Narayanan (32), Palani (29) and Ranganathan (22) were the other scorers. R. G. Raghavan and N. Narayana Rao took 2 wickets each.

When we went in to bat, Palaniappan, the Salem pace bowler, bowled like one inspired, and captured 5 for 31. On our side, N. Kalyanam alone offered anything like resistance; he was top scorer with his 41. P.R. Venkatesan contributed 17 to our modest total of 123.

The second out-of-station match was played against the Sowrashtra Cricket Club at the Manor House grounds, Salem, on February 7. In a low-scoring match, our opponents got the better of us by a margin of 39 runs.

The Sowrashtrians were able to aggregate only 101, against some good bowling and fielding. T. M. Srinivasan was responsible for making it a respectable figure by his own contribution of a 59 (n. o.) T. D. K. Sami and R. G. Raghavan captured 4 wickets each.

There is, however, no valid excuse for the failure of our batsmen at this match. Somehow, we were skittled out for 62 runs, even N. Kalyanam (of all batsmen on earth !) and N. Narayana Rao contenting themselves with 12 runs each ! N. V. Balusamy and Rengachari took 5 for 18 and 3 for 19.

This year we started a new series—the Bachelors *vs* Married men.

The first match played on February 14 ended in a draw after being a closely fought-out affair to start with.

Batting first, the Married XI collected 167 runs. K. Ganesh was 36, not out. P. B. Srirangan, skipper, was top scorer with 44. T. G. Rangan and T. S. Subba Rao scored 27 and 24 each. N. Narayana Rao took 5 wickets for 42 runs.

The Bachelors scored steadily, but at the draw of stumps, were 151 for 8, providing food for speculation as to what might have happened if there was still time. T. Anthony played very well for his 58, ably supported by K. R. Ramakrishnan, with his useful 42. The youngsters, Chandran and Ramadoss, warded off the veterans' attack for a pretty enough period during the closing stages, baulking them of victory. T. D. K. Sami took 4 for 54 and K. Sampath 3 for 29,

But the Married Fry could not be suppressed for ever. In a match played on February 2, the Bachelors well and truly got it—by 4 wickets.

Playing first, the Bachelors hit up 175 for 9 and declared. N. Kalyanam achieved the distinction of scoring his maiden (? !) century (101, retired). P. R. Venkateswaran scored 29 and was concerned in a big stand of 87 runs with Kalyanam. Chandran was not out for 21. R. Natarajan, (J. E.) forced into action to assist the depleted married attack, captured 4 wickets for 9 runs in an incredibly dizzy spell of bowling.

The Married took up the batting challenge of the Bachelors in right earnest, right from the beginning. T. D. K. Sami and K. Sampath rose to the occasion, the former replying with another grand century (100, retired) and the latter with 48. Their stand yielded 104 runs. The Bachelors' total was passed for the loss of only 4 wickets. K. R. Ramakrishnan took 4 wickets for 50 runs.

Our score board for the season: Matches won 1, Lost 5, Drawn 1.

Tennis: The new players are putting their best feet forward to catch up with the old ones. For a time, the game was held up by the refusal of the bamboo screens to dry up after being painted !

Volleyball: We participated in the Salem District Triples Tournament conducted at Salem Camp, Mettur Dam, in February this year. Our 'A' Team (A. P. S. Mani, Vincent, and George) made their exit in the first round itself, but not before giving the opponents a game fight. Our 'B' Team (N. Venkatachalam, N. Subramanian and A. P. S. Krishnan) survived the first round to go down tamely in the second.

Volleyball hath obviously lost its charms for our players; the court is practically always deserted.

Badminton: Our Team (S. Sambandam and K. Sampath) fared very well in the District Doubles Tournament held at Jalakandapuram in April. Our players went down fighting in the semi-finals, the match running to the full gamut of 8 games, and were awarded special medals for the striking form shown.

In the Friends Recreation Club Doubles Tournament at Salem in April, our Team (K. Rathnam and R. Krishnamurti) reached the quarter-finals and lost.

It appears as though our players have their practice only at the venue of the matches—and on the match day !

Table Tennis: We played a series of friendly matches with the Mettur Recreation Club in April.

Playing in our club premises, we won by 4 matches to 3, while at their club, we lost by 2 matches to 3.

Chess: The popularity of this game is steadily going up. We have now a few apprentices who are both thinkers and planners.

Caroms: Continues to draw.

Cards: In addition to Bridge, Dick and Rummy are also proving popular.

THEY WERE Welcome!

Dr. Ludwig F. Hill and Mr. H. Grezik with Mr. S. Ramaswamy, Production Superintendent, and Mr. R. V. Ramani, Senior Chemist.

Mr. H. E. Wright, Manager, Electrodes Dept. of the Union Carbide International Company, New York, examining the graphite plate assembly in a Hooker cell anode unit.

Among the distinguished guests who paid us the courtesy of a visit in recent months were :

Mr. E. V. Ganapathy Iyer, Commissioner of Development, Mysore, Mr. A. Manickavelu Naicker, Minister for Revenue, Madras, Dr. Ludwig, Mr. F. Hill and Mr. H. Grezik, Friedrich, Udhe, Dortmund, Mr. H. E. Wright of Union Carbide International Co., New York, Mr. S. R. Yekkar of Volkart Bros., and Srm. Sudhavati Devi.

Srimathi Sudhavati Devi, Daughter of Mr. Sri Prakasa, Governor of Madras, being shown round our works by Mr. K. Rajagopal, Engg. Superintendent.

Briefs

Central Salt Research Institute : The Central Salt Research Institute, Bhavnagar, was declared open by Mr. Jawaharlal Nehru on April 10, 1954, before a distinguished gathering of scientists, statesmen and industrialists, Mr. K. C. Reddi, Union Minister for Production, presiding. Mr. Reddy said that that the National Laboratories and Research Centres were notable landmarks in the country's progress.

Dr. S. S. Bhatnagar, and Shri P. A. Narielwala spoke on the importance of salt research. Declaring the Institute open, Mr. Nehru said : "The purpose of these national laboratories was not merely to learn and teach, but to help create an atmosphere of science through which we could increase the nation's strength in various ways. These research stations will serve as temples for the service of the country. Those who work here should not work merely for earning a living but with an understanding that they are serving their own motherland ".

Symposium at Karaikudi Institute : A two-day symposium on Electrochemical processes and their applications to Indian industry was organised by the Central Electro-Chemical Research Institute, Karaikudi on March, 27-28. Research workers, representatives of industry and of Government Departments, attended the symposium and discussed problems relating to electro-chemical processes. Mr. S. V. Ramamurthi, I.C.S. (Retd.) inaugurated the symposium. Several papers were presented at the symposium and among them were :

(1) *Operation of Hooker type "S" Caustic-chlorine Cells* by N. Kalyanam (Senior Chemist, MCIC) and

(2) *Electrolytic preparation of chlorates* by N. Subramanian (formerly Chemist of MCIC) and B.K. Sadananda Rao.

Element 99 : The production of element 99 with an atomic weight of 247 has been announced by the Atomic Energy Commission. It is radio-active and has a short half-life, reverting in a few minutes to berkelium element 97. The new element has been tentatively named 'Ekaholmium' because of its relation to element 67, Holmium. The element was first made in the 60-inch cyclotron in the Berkely Laboratories of the University of California. Although radioactive, it is not a fissile material.

Chlorine-di-oxide production and Bleaching :

The Allied Chemical Corporation of U.S.A. has developed a new method for the production of chlorine-di-oxide. The process is being operated commercially side by side with the application of chlorine-di-oxide for bleaching cellulose pulp by a new method. In the new process, sodium chlorate is reduced by methanol which is not only cheap, but has also this advantage—namely, that it produces little chlorine in side reactions.

Wetting agent for superphosphate manufacture : A new wetting agent–Sterox AJ—which serves as a processing aid for the manufacture of super phosphate has been put on the market by Monsanto Chemical Company. The wetting agent added to the acid during manufacture reduces surface tension, and ensures thorough mixing of acid and phosphate rock quickly. The advantages in its use are that the resulting product cures rapidly, and is free of hard and troublesome lumps.

Anti-rust paint : It is announced that a new one-coat anti-rust paint for steel has been produced by Adelphi Paint and Colour Works. Inc. N.Y. The paint "coventer-rust" will protect steel structures from corrosion for five to ten years. Its film thickness equals three coats of conventional rust-inhibitive paint. Solvents have practically been eliminated in the formulation to prevent formation of pinholes due to evaporation. High moisture resistance gives maximum protection to the metal.

Workable process for hydrochloric acid concentration: Investigations have been made by the University of Pennsylvania to develop a process which could be used to concentrate dilute solutions of hydrochloric acid to commercial strength by liquid—liquid extraction.

The aliphatic monohydric alcohols having from five to nine carbon atoms were found to be the best solvents. The workability of a liquid-liquid extraction process for the concentration of solutions of hydrochloric acid has thus been established. It has been found that the solvent could be recovered by contacting the acid-rich extract with benzene, followed by a fractional distillation to separate the two solvents. It is reported that concentration of hydrochloric acid by this method on a commercial basis would be economical.

Rubber Substitutes : For certain applications rubber substitutes can be prepared by vaporising ethylene di-oxide into a mixture of phosphoric anhydride and dry chloroform. The product of this reaction is a water soluble liquid. When this liquid is heated at 130-135 deg. C for two-and-a half hours, a rubber-like polymer is formed. Flame-resistant quality can be imparted to wood, paper and fabrics by impregnating these materials with the monomer. The polymer can be used as a curing agent on resin films of the urea formaldehyde type.

A good sport : It is time you got better acquainted with Mr. K. K. Dharmarajan, our Chief Accountant. A good sport, if there was one, he was awarded a special prize in our annual tournaments early this year for "playing the game." A more cheerful loser than Dharmarajan or a partner who can exude his buoyancy and enthusiasm, it will be difficult to run into. "Courage yet" may well be his personal slogan.

K. K. Dharmarajan

Dharmarajan's presentation in these pages is long overdue, so let us turn on him some belated spo(r)tlight.

After High School, Dharmarajan studied at the Government Victoria College, Palghat, but soon gave it up to take up an appointment with the Trichy-Srirangam Electric Supply Corporation. This was way back in the year 1926. He joined as a Store-keeper and turned this experience to good account to become the company's Accountant in 1939. And as in this year, the three associate companies of Trichy-Srirangam, East Tanjore and East Ramnad were amalgamated into one composite undertaking now known as the South Madras Electric Supply Corporation, Limited, Dharmarajan naturally had his hands full with figures in the preparation of the accounts of the new company. Early in 1942 Mr. Dharmarajan joined MCIC and an important assignment once again awaited him. The preparation of the first Balance Sheet of the Company, after it had been taken over by Seshasayee Bros., Limited, was largely his work.

For the past six years, Dharmarajan has been the Hon. Secretary of the Employees' Provident Fund.

Always of a genial and sunny disposition, it is a pleasure to meet Dharmarajan on work or off it at the Clubhouse.

Scholar : We would also like to introduce to you in this issue another member of the Accounts family. Mr. M. K. Rajagopal, Senior Clerk. Rajagopal had his early education at the National High School, Mannargudi, and later at the Annamalai University. He was in the English honours school, but did not remain in the University long enough to take his degree.

M. K. Rajagopal.

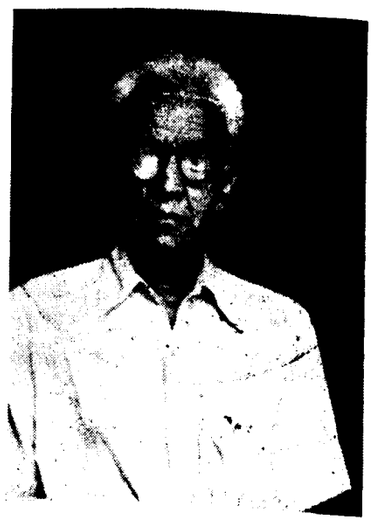
Rajagopal has a fine command of English, and his risible propensities are considerably tittivated when the customer's English (unlike the customer himself) is not always right. A great Sanskrit scholar, Rajagopal can quote profusely from Valmiki's immortal classic—the *Ramayana*. During this year's *Sri Rama Navami* festival he laid us all under a deep debt by reading out from the epic the lines dealing with Rama's *Pattabhishekam* (coronation ceremony) and explaining for our benefit the meaning and beauty lying embedded in Valmiki's verse.

No task is too difficult : Now to a plant personality—Mr. S. V. Mani Iyer, Workshop Foreman. Modest and unassuming, he is held in great esteem by his colleagues and assistants. Mani Iyer's formula for tackling any intricate work is simple. He will first analyse all the difficulties that the job involves and then proceed to attack it with gusto, with the result that the end product will be a thing of beauty.

Mani Iyer took his Certificate in Mechanical Engineering from the Engineering School, Bangalore, in 1924. Before joining us in 1940, he had seen service with the Harvey Mills, Ambasamudram, the North-Western Railway and the Port Engineering Works, Calcutta.

Few in the colony know that Mr. Mani Iyer is a fully qualified compounder, but he does not take his "orders" from doctors now—they flow from chemists and engineers.

Shining example : And that brings us on to Mr. A. R. Narayanan, Senior Chemist. He is a brilliant science graduate from St. Joseph's, Tiruchi.



S. V. Mani Iyer.

A. R. Narayanan.

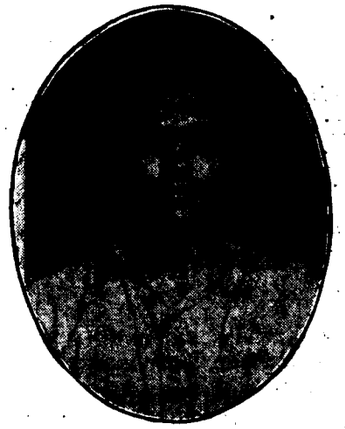
Narayanan joined MCIC in 1942 after a brief spell with Messrs. Parry & Co., Ranipet. For an example of an employee who can take his work in his stride—and with a smile on his lips—none so readily occurs to our mind as Narayanan. Laudable, indeed, is the manner in which he programmes his work in the Bleaching Powder and Hydrochloric Acid Sections. Remarkable, also, are the measures he takes for keeping the quality of our products uniform, and for eliminating waste.

A fine sportsman, even while at college, Narayanan has annexed several cups and medals in badminton and volleyball in MCIC tournaments. He took to tennis only in 1953, but took to it with such a vengeance that he was able to knock off all the cups in the tennis tournament of the year.

Remember about two years ago we wrote about a camera-shy Greta Garbo of a girl in the colony — Santha daughter of Narayanan? Santha has now a little brother. (This tail-piece is by way of topical justification.).

B. P. also stands for Bhajana Party : Meet, also, Mr. Narayanan's trusted Lieutenant N. Sivaraman.

Sivaraman hails from near-by Nangavalli, and joined MCIC in 1940. From 1942 onwards, he has been an operator in the Bleaching Powder Section. In the maintenance of registers, sampling of products and similar other chores, Sivaraman is adept.



N. Sivaraman.

A fairly good singer, he takes an outstanding part in the *bhajanas* which are now regularly organised in the colony.

மெட்கெமபத்திரிகை.

நாட்டின் இயற்கை வளம்—சுண்ணும்புக்கல்

P. B. ஸ்ரீரங்கன்

சுண்ணும்புக்கல் எல்லோருக்கும் தெரிந்த ஒரு சாதாரணப் பொருள். ஆனல் அது, நமக்கு இயற்கை அளித்திருக்கும் ஒரு சிறந்த ரசாயனப்பொருள் என்பது அநேகருக்குத் தெரிந்திருக்காது. அதன் உபயோகம் தொழிற்சாலைகளோடு மட்டும் நின்றுவிடவில்லை. நாகரீகம் முன்னேற்ற மடைந்து விட்டதற்கேற்ப, மனிதன் சௌகரியமாய் வாழ்வதற்கு சுண்ணும்பு ஒரு இன்றியமையாத பொருளாகிவிட்டது. சுண்ணும்பும் அதிலிருந்து செய்யப்படும் சிமெண்டும் இல்லாவிட்டால் கட்டிடங்கள் எவ்வாறிருக்கும்? நாகரீகமும், சௌகரியங்களும் எங்கேயிருக்கும்?

சரித்திரம்

சுண்ணும்பின் சரித்திரம் மனிதவளர்ச்சியுடன் ஒன்று கலந்திருக்கிறது. பல ஆயிரம் ஆண்டுகளாக மனிதன் சுண்ணும்புக் கல்லையும் சுண்ணும்பையும் உபயோகித்து வருகிறான். சுண்ணும்பு சுடுவது வெகு பழமையான ரசாயனத் தொழில்களில் ஒன்று. சரித்திரப் பேராசிரியர்கள் இதற்குப் பலசான்றுகள் அளித்திருக்கின்றனர். எகிப்து தேசத்திலிருக்கும் உலகப்பிரசித்தி பெற்ற பிரமிட்ஸ் (Pyramids) என்னும் கட்டிடங்கள் இதற்குத் தெளிவான ரான்று.

உபயோகங்கள்

நாகரீக வளர்ச்சிக்கேற்றவாறு சுண்ணும்பு பல்வேறு துறைகளில் உபயோகிக்கப்பட்டு வந்திருக்கிறது. ரசாயனக் காலம் என்று கூறப்படும் இக்காலத்தில் சுண்ணும்பு ஒரு நாட்டின் தொழில் வளத்திற்கு இன்றியமையாத பொருளாக இருக்கிறது. சுண்ணும்பு இல்லையேல், தொழில் வளமும் நாகரீகமும் இல்லை யென்றே சொல்லலாம். அது எவ்வாறென்று சிறிது ஆராய்வோம்.

சுண்ணும்புக்கல் (Calcium carbonate) சுட்ட சுண்ணும்பு, (Calcium oxide) நீர்த்த சுண்ணும்பு (Calcium hydroxide) இவைகள் கீழ்க்கண்ட மூன்று துறைகளில் பெரிதும் உபயோகப்படுகின்றன.

(1) கட்டிட வேலைகள் — 58 சத வீதம்
(2) தொழிற்சாலைகள் — 29 ,,
(3) விவசாயம் — 13 ,,

கட்டிட வேலைகள்

இத்துறையில் சுண்ணும்பு மிக அதிகமாக உபயோகப்படுகிறது. முற்காலத்தில் சுண்ணும்பை அப்படியே உபயோகித்து கட்டிடங்கள் கட்டிவந்தார்கள். தற்காலத்திலோ, சுண்ணும்பிலிருந்து சிமெண்ட் என்னும் பொருளை தயாரித்து உபயோகிக்கிறார்கள். சுண்ணும்பையும் களிமண்ணையும் கலந்து இரும்பு உருளைகளில், 1400 டிகிரி (சென்டிகிரேடு)க்கு சூடேற்றினல் சிமெண்ட் கிடைக்கும். இது சுண்ணும்பைவிட மிக்க வலிமையுள்ள பொருள். பெரிய கட்டிடங்கள், அணைகள் இவை எழுப்ப சிமெண்ட் மிகவும் பயன்படுகிறது. சுருங்கக் கூறின், மனிதனுடைய முன்னேற்றத்திற்கு இது இன்றியமையாதது.

சுண்ணும்பையும் மணலையும் கலந்து சுட்டு கற்கள் தயாரிக்கின்றனர். அவைகளை இரும்பு முதலிய பல தொழிற்சாலைகளில் பெரிய அடுப்புகள் கட்டுவதற்கு உபயோகிக்கிறார்கள். கல்நார் (Asbestos) என்னும் பொருளோடு கலந்து உஷ்ணத்தைக் காக்கும் பொருட்களைத் தயாரிக்கின்றனர்.

விவசாயத் துறை

சுண்ணும்பின் பல வகைகளும் விவசாயத் துறையில் உபயோகிக்கப்படுகின்றன. மண்ணிலுள்ள அமித அமிலத்தைக் குறைப்பதுமன்றி, தாவர வளர்ச்சிக்குத் தேவையான கால்சியம், மக்னீசியம் (Calcium, Magnesium) முதலிய உலோகப் பொருள்களையும் சுண்ணும்பு கொடுக்கிறது. பல உரங்களில் இது கலக்கப்படுகிறது. மேலும், தாவரங்களை அழிக்கும் பூச்சிகளோடு போரிடுவதில், விவசாயிகளுக்கு முக்கிய ஆயுதமாகப் பயன்படுகிறது. மேலும் போர்டோ மிக்சர் (Bordeaux Mixture) சுண்ணும்பு கந்தகம் (Lime Sulphur) போன்ற பல ரசாயனப் பொருள்கள் தயாரிப்பதிலும் உபயோகப்படுகிறது.

பொருந்பத்தித்துறை

பல உலோகங்கள் தயாரிப்பதில் சுண்ணும்பு இன்றியமையாத பொருள். இதன் முக்கிய உபயோகம் எஃகு தயாரிப்பதில்தான். மூன்று டன் எஃகு தயாரிக்க ஒரு டன் சுண்ணும்புக்கல் தேவையாயிருக்கிறது. எஃகு, இரும்பு இவைகளிலுள்ள அசுத்தங்களை சுண்ணும்பு அகற்றுகிறது. பல ஆயுதங்களும், நுணுக்கமான அளவு கருவிகளும் செய்வதற்கு வேண்டிய கடினமான உயர்ந்த ரக எஃகு தயாரிப்பதிலும் இது உபயோகப்படுகிறது.

மேலும், பாக்ஸைட் என்னும் அலுமினிய கனிப்பொருளிலிருந்து மணலைப் பிரிக்கவும், பொன், வெள்ளி, நிக்கல்,

முதலிய உலோகங்களை அவைகளின் தாதுப் பொருள்களிலிருந்து தயாரிக்கவும், சுட்ட சுண்ணாம்பும், நீர்த்த சுண்ணாம்பும், பயன்படுகின்றன.

ரசாயனத்துறை

பிளீச்சிங் பௌடர் (சலவை செய்யும் பொடி)

இப்பௌடர் தயாரிப்பதில் ஆரம்பப் பொருளே சுண்ணாம்புதான். நீர்த்தசுண்ணாம்பையும் ஹரிதகத்தையும் (Chlorine) ஒன்று கலப்பதால் பிளீச்சிங் பௌடர் கிடைக்கிறது. இதற்குச் சுண்ணாம்பு மிக சுத்தமாயிருக்கவேண்டும். சங்கரி துர்க்கத்திலிருந்து நமக்குக் கிடைக்கும் சுண்ணாம்புக்கல் இதற்கு மிக உகந்ததாயிருக்கிறது. பிளீச்சிங் பௌடரில் சுமார் 30சதவிகிதம் ஹரிதகம்(Chlorine) இருக்கும். ஐரோப்பிய நாடுகளில் இப்போது பல ஆராய்ச்சிகள் செய்து இதை 80லிருந்து 90 சதவிகிதம் வரை உயர்த்தியிருக்கின்றனர். பிளீச்சிங் பௌடர் துணிகளை சலவை செய்யவும் வியாதிக் கிருமிகளைக் கொன்று தொத்து வியாதிகள் பரவாமல் தடுப்பதற்கும் உபயோகப்படுகிறது.

சோடாக்காரம் (Sodium Hydroxide)

சால்வே முறையில் வாஷிங் சோடாவையும், (Soda ash) நீர்த்த சுண்ணாம்பையும் கலந்து சோடாக்காரத்தைத் தயாரிக்கிறார்கள்.

கால்சியம் கார்பைடு (Calcium Carbide)

சுண்ணாம்பையும் நிலக் கரியையும் கலந்து அதிக உஷ்ணப்படுத்தினால் கால்சியம் கார்பைடு உண்டாகும். இதைத் தண்ணீருடன் கலந்தால் அஸிடிலீன் (Acetylene) என்னும் வாயு கிடைக்கிறது. அமெரிக்காவில் இப்போது இந்த வாயுவிலிருந்து பல்வேறு நவீன செயற்கைப் பொருட்களைத் தயாரிக்கிறார்கள். அஸிடிலீன் ரசாயனம் என்றே ஒரு தனிப் பெரும் பிரிவு ஏற்பட்டிருக்கிறது.

கண்ணாடி

கண்ணாடி உற்பத்திக்கு இன்றியமையாத மூலப் பொருள்களில் சோடா உப்புக்கும் மணலுக்கும் அடுத்தபடியாக சுண்ணாம்பு இருக்கிறது.

சில கண்ணாடி உற்பத்தித் தொழிற் சாலைகளில் சுண்ணாம்புக் கல்லையும், சில வற்றில் சுட்ட சுண்ணாம்பையும் வெவ் வேறு சதவிகிதங்களில் உபயோகிக்கின்றனர்.

காகிதம்

காகிதம் தயாரிப்பதற்குத் தேவையான பொருள்களைச் சமைப்பதற்கு உகந்த திரவம் தயாரிக்க சுண்ணாம்பு உபயோகப்படுகிறது. மேலும், கருநீர் என்று கூறப்படும் கழிவு நீரிலிருந்து, விலையுயர்ந்த சோடாக் காரத்தை வீணாக்காமல் மறுபடி எடுப்பதற்கும் உதவுகிறது.

சர்க்கரை

சர்க்கரைப் பாகிலிருந்து அசுத்தங்களை நீக்கி அதை வெண்மையுள்ளதாகச் செய்ய சுண்ணாம்பை பாகில் கலந்து சிறிது நேரம் வைத்திருந்து பிறகு வடிகட்டுகிறார்கள்.

மேலும் தொழிற்சாலைகளிலிருந்து வெளியே போகும் கழிவு நீரிலுள்ள

அமிலங்களையும், மற்றும் பல தீய ரசாயனப் பொருள்களையும் சுண்ணாம்பு அகற்றுகிறது. இங்கு குறிப்பிடப்பட்ட முக்கியமான தொழில்களில் மட்டுமல்லாமல் வேறு பல தொழிற்சாலைகளிலும் பல்வேறு பொருள்கள் தயாரிக்க சுண்ணாம்பு உபயோகப்படுகிறது. அவைகளில் சில மேலே கொடுக்கப்பட்டிருக்கின்றன.

1. சாயப் பொருள்கள் (Dye Stuffs).

2. கால்சியப் பொருள்கள் (Calcium Compounds)

3. பாலிலிருந்து தயாரிக்கப்படும் சில பொருட்கள்.

4. ஜிலேடின் (Gelatin) கோந்து, குளுகோஸ் (Glucose) டெக்ஸ்டிரின் (Dextrin) முதலியன.

5. வெள்ளை பெயிண்ட் (வர்ணம்)

6. தோல்பதனிடும் தொழிலில் தோலிலிருந்து ரோமத்தை நீக்கி, தோலை மிருதுவாக்க.

7. பெட்ரோலியம் (Petroleum)என்ற மண்ணெண்ணெயிலிருந்து அசுத்தங்களை நீக்க.

நீரை சுத்தமாக்க

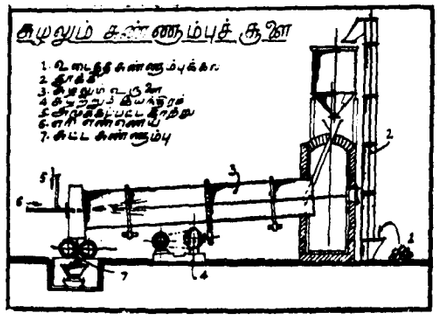
தண்ணீரை சுத்தப்படுத்துவதில் சுண்ணாம்பு முக்கியமாக உபயோகிக்கப்படுகிறது. தண்ணீரிலிருக்கும் அதிக அமிலத்தைக் குறைத்து, பல அசுத்தங்களை அடியில் படியும்படிச் செய்கிறது. சுமார் 24 முதல் 48 மணி நேரத்திற்குள் கிருமிகளையும் கொன்றுவிடுகிறது. இந்தத் தண்ணீரை வடிகட்டி, குடி தண்ணீராக உபயோகிக்கலாம். மேலும், நீரை ஆவியாக மாற்றும் பாய்லருக்கு (Boiler) தீங்கிழைக்க கூடிய பைகார்பனேட் (Bicarbonates) உப்புக்களை அகற்றுகிறது.

நாகரிக வளர்ச்சிக்கேற்றவாறு பல புதிய பிரச்னைகளும் தோன்றுகின்றன! அவற்றிலொன்று, அபரிமிதமாகத் தள்ளப்படும் சாக்கடைத் தண்ணீரை என்ன செய்வது என்பது. அதை ஏற்றுக்கொள்ள நதியோ கடலோ இல்லாத நகரங்களில் இது பெரிய தொல்லையாயிருந்தது. ஆனால் அதற்கும் ஒரு வழி கண்டுபிடித்து விட்டார்கள். சாக்கடை நீரிலிருக்கும் அசுத்தங்களையும், கிருமிகளையும் நீக்கிவிட்டு அதை மறுபடியும் உபயோகிக்கத் தற்போது இயலும்! இதற்காக உபயோகப்படும் பல ரசாயனப் பொருள்களில் சுண்ணாம்பும் ஒன்று!

இவ்வாறு, சுண்ணாம்பின் உபயோகங்களைப்பற்றி ஒரு தனி புத்தகமே எழுதிவிடலாம்! இவ்வளவு உபயோகமுள்ள பொருள் எவ்வாறு கிடைக்கிறது என்பதையும் அறிந்து கொள்ளுதல் நலம்.

சுட்ட சுண்ணாம்பு

கால்ஷியப் பிராணயுதியும் (Calcium oxide) கரியமிலவாயுவும் (Carbon di-oxide) ஒன்று சேர்ந்ததே சுண்ணாம்புக் கல் (Calcium carbonate). இயற்கையில் கிடைக்கும் சுண்ணாம்புக் கல்லைச் சுட்டால், கரியமிலவாயு அகன்று விடும். மிகுதியிருக்கும் பொருளே கால்ஷியப் பிராணயுதி என்ற சுட்ட சுண்ணாம்பு. சுண்ணாம்பைச் சுடுவதில் இரு வகைகளுண்டு. இவை சுடாகச் சுடுதல்,



தொடர்ச்சியாகச் சுடுதல் என்பன. பழங் காலத்தில் முதலில் குறிப்பிட்ட முறையே அனுசரிக்கப்பட்டு வந்தது சுண்ணாம்புக் கற்களுடன் விறகையோ அல்லது கரியையோ கலந்து சூளைகள் எழுப்பி எரியவிடுவார்கள். முழுவதும் எரிந்த பிறகு சுட்ட சுண்ணாம்பை எடுப் பார்கள். இம்முறையில் கிடைக்கும் சுண்ணாம்பில் கரியும், சுடப்படாத கற் கள் போன்ற அசுத்தங்கள் கலந்தே யிருக்கும். நேரமும் வீணாகும். ஆகை யால் தற்காலத்தில் தொடர்ச்சியாகச் சுற்றிக்கொண்டே யிருக்கும் சூளை யையே உபயோகிக்கிறார்கள். நம் தொழிற்சாலையிலும் இம் முறையையே பின்பற்றுகிறோம்.

சுமார் 60 அடி நீளமும், 6 அடி விட்ட முமுள்ள ஒரு இரும்பு உருளை ஒரு முனை உயரமாகவும், மற்றொருமுனை தாழ்வாக வும் இருக்கும்படி சிறு சிறு இரும்பு உருளைகளின் மீது பொருத்தப்பட்டி ருக்கும். இந்த உருளை சுற்றிக்கொண் டேயிருக்கும். உருளையின் உள் பக்கத் தில் உஷ்ணத்தைத் தாங்கக் கூடிய கற் கள் (Fire bricks) பதிக்கப்பட்டிருக்கும். மேல் முனையில் பொடியாக்கப்பட்ட சுண்ணாம்புக்கல் தொடர்ச்சியாக விழுந்து உருளையின் வழியே சென்று கீழ் முனையில் விழுந்துகொண்டே யிருக் கும். இந்த முனையில்தான் எண்ணெயோ அல்லது கரித்துகளோ எரிக்கப்படும். அமுக்கப்பட்ட காற்றினால் தீக் கொழுந்து உருளையினுள் வெகு தூரம் பரப்பப்படும். சுமார் 1000 டிகிரி உஷ் ணத்தில் கற்கள் வெளியே விழுவதற் குள் பூராவாகச் சுடப்பட்டுவிடும். உஷ் ணக் காற்று வெளியேறுவதற்கு முன் னால் உள்ளே விழும் கற்களை சூடாக்கி விட்டுப் போகிறது. இம் முறையில் கிடைக்கும் சுண்ணாம்பு மிகச் சுத்தமா யிருக்கும். இவ்விதம் ஒரு நாளைக்கு சுமார் 10 டன் உற்பத்தி செய்யப்படு கிறது. உஷ்ணத்தை மேலும் சுமார் 1500 டிகிரிக்கு அதிகப்படுத்தினால் முழு வதும் சுட்ட சுண்ணாம்பு (Dead burnt Dolomite) என்ற ஒரு ரக சுண்ணாம்பு கிடைக்கும். இது சில தொழிற்சாலை களுக்காகத் தனியாகச் செய்யப்படுகிறது.

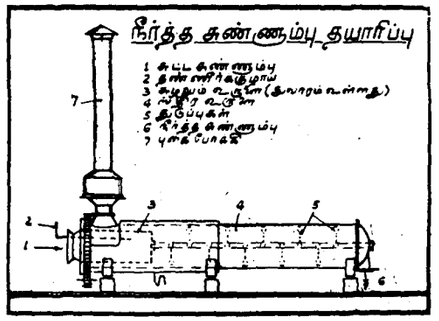
நீர்த்த சுண்ணாம்பு

சுட்ட சுண்ணாம்பிலிருந்து நீர்த்த சுண்ணாம்பு (Calcium hydroxide) செய் வதற்கும் சுற்றும் உருளையே உபயோ கப்படுகிறது. உருளையினுள் சுட்ட சுண்ணாம்பைப் போட்டு அதன்மேல் தண்ணீரைத் தெளித்தால், நீர்த்த சுண் ணாம்பு உண்டாகும். அது, உருளையி லுள்ள துவாரங்களின் வழியே மற் றொரு உருளையில் விழுந்து அங்கிருந்து துடுப்புகளின் உதவியால் தொடர்ச்சி யாக வெளியேற்றப்படும்.

சுண்ணாம்பு வீரியமுள்ள பொருளா கையால் அது தனியே கிடைக்கமுடி

யாது. கரியமிலவாயுவுடன் கலந்து சுண்ணாம்புக்கல், கிளிஞ்சல், சலவைக் கல் முதலிய பொருள்களாகக் கிடைக் கிறது. இங்கிலாந்தில் போர்ட்லாண்டு (Portland) என்னுமிடத்தில் கிடைக்கும் சுண்ணாம்புக்கல் உலகப் பிரசித்தி பெற் றது. இந்தியாவிலும் பல இடங்களில் சுண்ணாம்புக்கல் அகப்படுகிறது. முக்கி யமாக ஜபல்பூர், சில்ஹெட் முதலிய இடங்களைக் குறிப்பிடலாம். தென்னிந் தியாவில் சேலம் திருநெல்வேலி ஜில்லாக் களில் கிடைக்கிறது. நம் தொழிற் சாலைக்கு வேண்டிய சுண்ணாம்புக் கற் கள் சங்கரிதுர்க்கத்திலிருந்து கொண்டு வரப்படுகிறது. அங்கு சுமார் 28 ஏகர் பரப்பிற்கு பூமிக்கடியில் சுண்ணாம்புக் கல் இருக்கிறது. சுமார் 7 லட்சம் டன் இருக்குமென்று கணக்கிட்டிருக்கிறார் கள். இங்கு கிடைக்கும் கற்கள் அநேக மாக மிகச் சுத்தமானதாகவே யிருக்கின் றன. ($CaCO_3$ 98%)

அமெரிக்கா, பிரிட்டன், ஜெர்மனி முதலிய மேல் நாடுகள் தொழிற் துறை யில் வியக்கத்தக்க முன்னேற்றம் அடைந்திருக்கின்றன. அதனால் அத் தேசங்களில் தொழிற் செல்வம் மிக உயரிய நிலையிலிருக்கின்றது. இந்தியா வும் அங்ஙனம் முன்னேற வேண்டு மென்ற ஆவலுடன் நமது அரசாங்கத் தினர் திட்டங்கள் பல வகுத்து அவை



களுக்கு வேண்டிய மூலதனத்தையும் பொதுமக்களிடமிருந்தே சேர்க்க ஆரம் பித்திருக்கின்றனர். புதிய தொழிற் சாலைகள் ஆரம்பிப்பவர்களுக்கு எல்லா வித உதவியும் செய்யத் தயாராயிருக் கின்றனர். மேல் நாட்டாரும் இப்போது நமக்குத் தொழில் நுட்ப உதவி அளிக்க முன் வந்துள்ளனர். இன்றியமையாத மூலப் பொருள்களாகிய நிலக்கரி, சுண் ணாம்புக் கல் முதலியவைகளை இயற்கை அன்னை நமக்கு உவந்தளித்திருக்கிறாள். இனி, நாமும் தொழிற் துறையில் முன் னேற்றமடைந்து மற்ற நாடுகளுடன் சமமாக நிற்பதற்குத் தன்னம்பிக்கையும் தளராத ஊக்கமும் சலியாத உழைப்பும் தான் பிக்க அவசியம். அன்னை நாட் டின் பெருமைக்கு—பொது நலத்திற் குத்—தளராது உழைப்பது ஒவ்வொரு இந்தியரின் தலையாய கடமை என்பதை நாம் கூறவும் வேண்டுமோ?

மெட்கம் செய்திகள்

வேத நாம சங்கீர்த்தன சபையின் 3-வது சம்மேளனம்

இவ்வாண்டு இச்சம்மேளனம் மேட்டூர் டவுனில் பிப்ரவரி 1, 2, 3 தேதிகளிலும், கெமிகல்ஸ் ஸெகண்டரி பாடசாலை கட்டிடத்தில் 4, 5, 6, 7 தேதிகளிலும் நடைபெற்றது. ஸ்ரீ L. S. பார்த்தசாரதி அய்யர், (Retired District Judge) அக்ராஸனம் வகித்தார். பிரம்மஸ்ரீ ஸ்ரீவத்ஸ ஸோமதேவ சர்மா, N. K. வெங்கட்ட ரமணசாஸ்திரிகள், மஞ்சக்குடி ஸ்ரீ ராஜகோபால சாஸ்திரிகள், அக்னிஹோத்ரம் ஸ்ரீ ராமானுஜ தாத்தாசாரியார், குண்டலம் ஸ்ரீ V. ரங்காச்சாரியார் முதலிய பெரியோர்கள் உபன்யாசம் செய்தனர்.

திவ்யநாம பஜனை மஹோத்சவம் ப்ரம்மஸ்ரீ புதுக்கோட்டை கோபாலகிருஷ்ண பாகவதர்.

திவ்ய நாம பஜனை உத்சவம்

புதுக்கோட்டை ப்ரம்மஸ்ரீ கோபால கிருஷ்ண பாகவதர் அவர்கள் மேட்டூர் கெமிக்கல்ஸ் காலனிக்கு விஜயம் செய்திருந்த சந்தர்ப்பத்தை ஒட்டி பிப்ரவரி 9, 10, 11 தேதிகளில் திவ்யநாம பஜனை மிக விமரிசையாக நடத்தப்பட்டது. ஸ்ரீ கோபாலகிருஷ்ண பாகவதர் அவர்கள் பக்தி பாவத்துடன் பஜனையில் ஒன்றியதானது எல்லா ஆஸ்திகர்களையும் மெய்மறக்கச்செய்தது. இவ்விசேஷ வைபவத்தில் கெமிகல்ஸ் பஜனை சமாஜத்தினரும், விசேஷமாக ஸ்ரீமான்கள் K. V. ராமசாமி, K. ராமனுதன், V. ஸ்வாமினுதன், கிருஷ்ணசாமி ஐயங்கார், சமீபத்தில் காலஞ்சென்ற V. ராமமூர்த்தி மற்றும் மேட்டூர் துரைசாமி பாகவதர், பஞ்சநதம் (S. D. O.) முதலியோரும் பங்கு கொண்டனர்.

மின்சார விளக்கு வசதி விநியோப்பு வைபவம்

கெமிகல்ஸ் காலனியில் முப்பத்தோரு "G"டைப் வீடுகளுக்கு பிப்ரவரி மாதம் 19-ம் தேதி முதல் மின்சார விளக்கு வசதிகள் அளிக்கப்பட்டன. தொழிலாளர் சங்கத் தலைவர் ஸ்ரீ P. ரங்கசாமி அவர்கள் இந்த இல்லங்களுக்கு மின்சாரம் அளிக்கும் விசையை பல கெமிக்கல்ஸ் சிப்பந்திகள் கூடிய கூட்டத்தில் முதன் முதலில் பிரயோகித்து, ஒரு சொற்பொழிவும் நிகழ்த்தினர். இந்த மின்சார வசதிகளைத் தாமதமின்றி இணைத்துக்கொடுத்த மின்சார நிலைய அதிகாரிக்கும் அவருடைய சிப்பந்திகளுக்கும் அவர்தம் பாராட்டுதலையும் நன்றியையும் தெரிவித்துக்கொண்டு இதுபோன்ற வசதிகள் காலனியின் மற்ற பகுதிகளுக்கும் விரைவில் அளிக்கப்படவேண்டும் என்று கேட்டுக் கொண்டார்.

மகாபாரத உபன்யாசம்

மார்ச் 6-ம் தேதி முதல் 11-ம் தேதி வரை மேட்டூரிலும், 12-ம் தேதி முதல் 17-ம் தேதி வரை கெமிகல்ஸ் ஸெகண்டரி பாடசாலையிலும், சேங்காலிபுரம் ஸ்ரீ அனந்தராம தீக்ஷதர் அவர்களால் ஸ்ரீமத் மகாபாரதப் பிரவசனம் செய்யப்பட்டது. இந்த உபன்யாசங்களைக் கேட்க தினசரி ஆஸ்திக மகாஜனங்கள் ஏராளமாக வந்திருந்து சிறப்பித்தனர். மார்ச் 17-ம் தேதியன்று உபன்யாஸம் முடிந்ததும், மேட்டூர் மின்சார இலாகா டிவிஷனல் இஞ்சினியராக இருந்த ஸ்ரீ P.R. சுந்தரம் அவர்கள் பாகவதரைப் பாராட்டிப் பேசி அன்னருக்குப் பொன்னாடை போர்த்தி கௌரவித்தார். மேட்டூர் ஆஸ்திக பக்தர்களின் சார்பில் பாகவதர் அவர்களுக்குச் சன்மானமும் அளிக்கப்பட்டது.

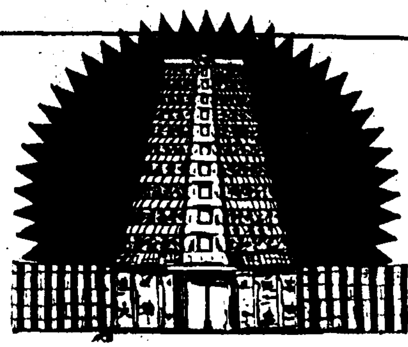
ப்ரம்மஸ்ரீ சேங்காலிபுரம் அனந்தராமதீக்ஷதர் மஹாபாரத உபந்யாஸம்.

ஸ்ரீராமநவமி உத்சவம்

கெமிகல்ஸ் பஜனை சமாஜத்தினர் இவ்வருஷம் ஏப்ரல் 3-ம் தேதி முதல் 12-ம் தேதி வரை ஸ்ரீராமநவமி விழாவைக் கொண்டாடினர். தினமும் காலையில் ஸ்ரீமத் ராமாயண பாராயணமும், சூர்யநமஸ்காரம்யஜுர்வேத பாராயணமும்; இரவில் ஸஹஸ்ரநாம அர்ச்சனை, பஜனை முதலியவைகளும் நடைபெற்றன. ஏப்ரல் 11-ம் தேதி காலையில் பஜனை பத்தரியில் சீதாகல்யாண மஹோத்சவமும் மாலையில் ஸ்ரீ ராமர் பட ஊர்வலமும் நடந்தன. அன்று முழுவதும் அகண்ட ராம நாம ஜபமும் நடத்தப்பட்டது.

ஏப்ரல் 12-ம் தேதியன்று இவ்விழாவை ஒட்டி, சங்கீத பூஷணம் சாத்தூர் ஸ்ரீ A. G. சுப்ரமணியம் அவர்களால் தக்க பக்க வாத்யங்களுடன் இன்னிசைக் கச்சேரி நடைபெற்றது.

சாத்தூர் A. G. சுப்ரமணியம்.



கோபுரம் மார்க் கலப்பு உரங்கள்

விவசாயிகளுக்கு ஓர் முக்கிய அறிவிப்பு

குறைந்த செலவில் நிறைந்த லாபம்

கோபுரம் மார்க் கலப்பு உரங்கள், நெல், வாழை, கரும்பு, மஞ்சள், மிளகாய், புகையிலை, தென்னை, பருத்தி, வெங்காயம், நிலக்கடலை, காய்கறிகள், கொடிக்கால் இன்னும் இதர எல்லா பயிர்களுக்கும் தனித்தனியாக அந்தந்த பயிர்களுக்கு ஏற்றவாறு சிறப்பான பொருள்கள் சேர்த்து தயாரிக்கப்பட்டுள்ளன.

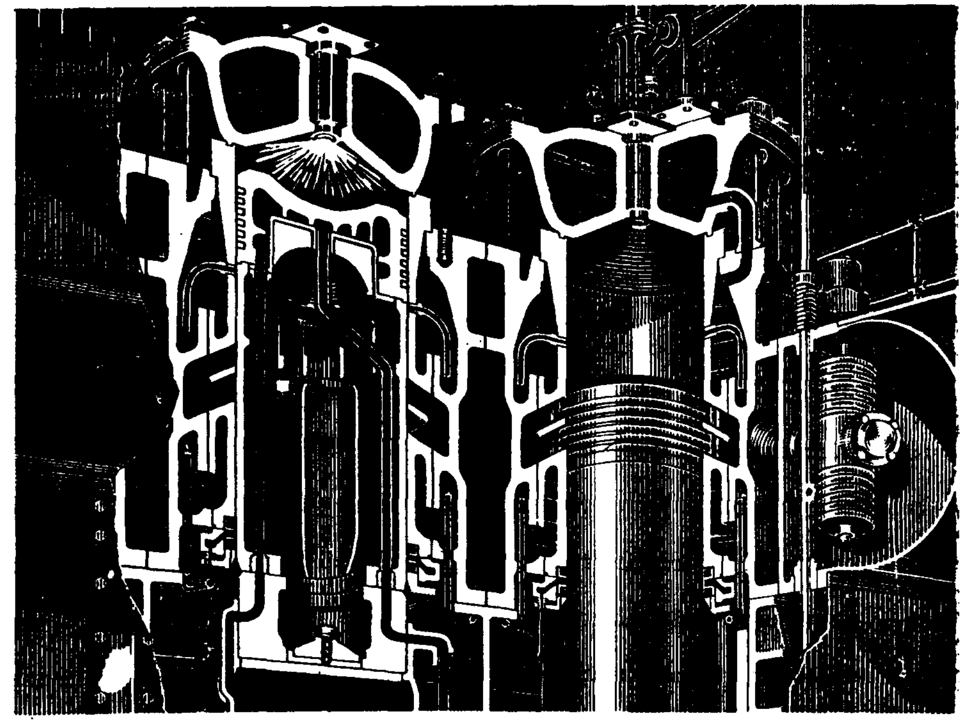
உங்கள் விவசாயத்தில் உபயோகித்து ஊதியமடையுங்கள்.

அமோனியம் சல்பேட், சூபர் பாஸ்பேட் உரங்களும், மற்றும் பூச்சி மருந்துகளும் கிடைக்கும்.

தென் மதராஸ் ஏஜென்ஸீஸ் லிமிடெட்

பவர் ஹவுஸ், தென்னூர், திருச்சிராப்பள்ளி.

திருச்சி, தஞ்சை, இராமநாதபுரம் ஜில்லாக்களில் எங்கள் டிப்போக்கள் நிறுவப்பட்டுள்ளன



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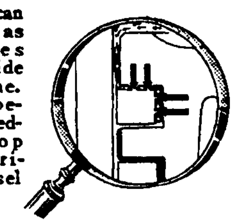

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