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Cover Picture

* Manufacture of Tea Chest Battens.

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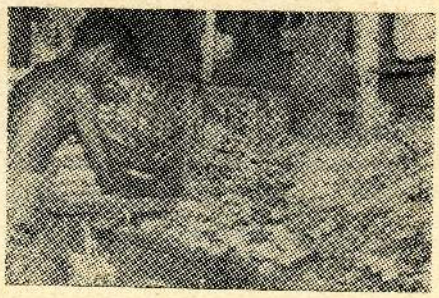
TEA CHEST BATTEN INDUSTRY



Packing tea in plywood chests for export is an activity which is as old as Sri Lanka's tea industry itself. Experiments conducted a few years ago, to find alternate packing materials so as to conserve wood have failed to show satisfactory results. Therefore the tea chest manufacturing industry continues to be of vital importance to the tea industry in Sri Lanka.

Excluding the small quantity of tea that is exported to the Middle East in wooden boxes, and a very small quantity despatched in small card-board boxes on special orders, the bulk of the tea exports to Europe are in plywood tea chests.

Battens

The strips of wood which are used in making the supporting wooden frame for the tea chest panels, are called tea chest battens. The quantity of battens required for turning out one tea chest is called a set of battens.

The number of battens in a set and their measurements are determined by the size and method of construction of the chests. The chests which have battens fixed only on the four upper edges and the four lower edges require a set of eight battens. In such a set, all eight battens are cut at an angle of 45°. Tea chests that are constructed with four additional square-ended battens fixed on to the four horizontal edges for extra strength require a set of twelve battens. Sets of battens used for full size tea chests are classified as full-size battens while those used in manufacturing half size tea chests are referred to as half-size battens. A set of halfsize battens, comprises eight battens of 15.4 inches (390 mm) mitred ends while, a full set of half size battens will consist of 4 battens of 15.4 inches (390 mm) and 4 battens of 19.3 inches (490 mm). A set of 12 battens will have 4 battens with square ends in addition to the above. Whether it be a half size or full size set, there is no difference in the length of the square-ended battens. The cross-section of each of these battens should be 0.8″ (21 mm) × 0.8″ (21 mm).

The Market

At the existing level of production, 4.5 million tea chests are required annually for packing tea. An equivalent quantity of sets of battens are also required in manufacturing these chests. At present there are a few small-scale manufacturers of battens in addition to a few large scale saw millers who are also engaged in this business.

by

K. J. Wanasinghe

Asst. Director,

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The State Plantation Corporation, Janatha Estates Development Board and the Janawasa Commission are the principal bodies which purchase battens from these manufacturers, in order to supply the tea chest components required by producers of tea chests. Enquiries made from these institutions recently revealed that they find it extremely difficult to obtain these battens and that batten manufacturers could easily obtain orders for the supply of these items. However, it would be more appropriate for prospective industrialists who wish to embark on this industry to ascertain the demand for their products.

Process

Logs are sawn into 7/8″ planks and stacked exposed to sunlight at a well ventilated place to be seasoned. The time required for the planks to be properly seasoned, i.e for the moisture content of the wood to reach 14% by weight will vary from a few days to several weeks depending on the type of wood, its moisture content and the weather conditions. The well-seasoned wood is thereafter cut cross-wise into the required lengths of the battens.

The pieces of wood for the square-ended batten should be cut straight and those for battens with mitred ends should be cut at an angle of 45°. The planks sized in this manner are then split (cut length-wise) into strips of the thickness specified for the battens. The battens thus obtained should be planed to give them a smooth finish on the surface.

The perfect battens, (i.e. those without defects) may now be selected and made into bundles of hundred battens each to be despatched to the market. Eight or twelve bundles of battens of the specified size will contain 100 sets of battens each containing eight or 12 battens.

Raw Material

To turn out a set of 12 full-size battens, 1.75 square feet of 7/8" planks are required. The approved timber for manufacturing tea chest battens, as appearing in the Ceylon Standards Specifications for Plywood tea chest components are:

Albisia, Anunuwenna, Aridda, Bomi, Diyataliya, Etamba, Hal, Hulang Idda, Kankabal, Katuboda, Karaw, Walukeena, Kekuna, Kirihembiliya, Lavulu, Malaboda, Thiniya, Walbiling.

Commonly used

Albisia is the species commonly used at present. In view of the present scarcity of timber, it is important to explore the possibility of using cheaper, more easily available varieties of wood than those mentioned in this list for the manufacturing of tea chest battens. The battens manufactured out of these varieties, should be similar in strength to those specified in the list. They should season without being warped, be able to bear nailing and retain nails, be free of odours and also not affect the taste, smell and the quality of the tea.

Machinery, Buildings and other Requisites

To saw timber into planks, circular saws or bands-saws driven by high horse-powered motors will be required. Such machinery will call for a large investment and the capacity of machines of this scale cannot be fully utilized in a small workshop set up mainly for the manufacture of tea chest battens. Therefore almost every small industrialist engaged in the batten manufacturing industry obtain their requirement of 7/8" planks from saw mills.

In order to size these planks a saw-bench with 2 circular saws 14" in diameter and powered by a 3 phase, 3 horse power motor is required. Such a saw-bench may be turned out at a light engineering workshop. In addition to the saw bench, hand planers for planing the battens, a carpentry work bench, coir rope for bundling the battens and a wooden bench for the persons engaged in the bundling work are also required for this industry.

A semi-permanent building with a floor area of approximately 40' × 20' will be required to install this machinery etc. and to stock the finished products until it is sent to the market. A block of land approximately 10 perches in extent will be adequate for this building and for stacking the wood for seasoning in the open-air.

The location of this industry in close proximity to a store which will purchase the battens and a saw mill from which planks could be bought would bring about saving in transport costs.

Equipment and Production

Seasoning, sawing, planing, sorting and bundling processes can be carried out on a contract basis. By employing a gang of about 6 persons, 12,500 sets of battens may be manufactured monthly in an unit of the type described here.

Profitability

A workshop of the scale indicated above will require an investment of about Rs. 55,000/- *on which an annual profit of approximately* 20% *may be obtained.*

GLOBAL POLICY FOR VEGETABLE OILS MOOTED

According to UNIDO most of the world's growers, processors and importers of vegetable oils and fats share the opinion that markets for oil products will grow until the end of the century mainly in the developing countries. Consequently they feel that additional capacities, for processing oil bearing materials, such as coconuts, palm kernels, palm fruits, groundnuts should be installed.

At a recent UNIDO conference held in Madrid the consensus was that markets in the developed countries were becoming saturated whilst in the developing world the demand among increasing populations would rise in line with incomes and improved market techniques. The share of tropical oils in the total oils and fats consumed in developed countries however could be increased according to the participants.

Among the recommendations of the conference were the examination of the possibilities of a global policy in regard to vegetable oils and the undertaking of two types of technical evaluation surveys in selected developing countries. The first survey will assess, for example, the future supply, quality, main commercial, technical, financial, and material hindrances to development. The second will examine the present under utilisation of production capacity of the vegetable oil industries sector. The outcome of these surveys will be taken into consideration in planning project programmes in the future.

This was the 4th meeting in a series of UNIDO consultations on industrial branches regarded as basic in the whole process of industrialisation.

(*Ceylon Commerce*, June 1978)

Manufacture of Safety matches

Importance of Quality Control

by **L. L. S. K. Silva**
Bureau of Ceylon Standards

In every household safety matches are essential in carrying out daily functions. In lighting the fire place, cookers, lamps and most commonly the cigarettes and cigars, safety matches become essential. At this juncture the quality of the matches play a vital role as this will add a couple of cents more to the daily budget and finally go to swell the yearly expenses. Apart from this, poor quality matches have been the cause of many accidents.

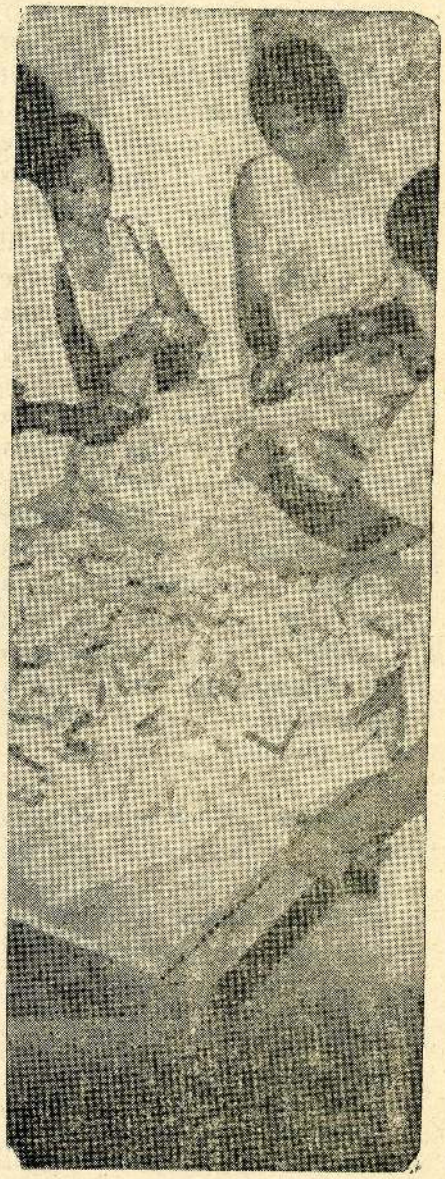
It is estimated that the yearly production of safety matches is around 27,600 cases, but the total requirement is around 40,000 cases. To bridge this gap it was necessary to import matches. With the allocation of free import licences a large quantity of safety matches has been imported both by the C.W.E. as well as the private importers. Now it had become necessary to improve the quality of locally manufactured safety matches to compete with the imported ones which are sold for only a few cents more than the locally manufactured matches.

In Sri Lanka the production of safety matches could be classified into two categories namely mechanized and semi-mechanized. The mechanized methods account for the production of more than half the safety matches produced locally. It is fairly easy to maintain a uniform quality by adopting a mechanized method whereas the semi-machanized methods produce safety matches with a very wide variation in the quality.

Twelve factories

In addition to seven privately owned safety match factories there are five factories maintained by the public sector, both on District Development Council basis and co-operative basis. These factories are mainly geared to provide employment and at the same time try to fill the gap between consumption and production. As a step in improving the quality of safety matches the government had taken a number of steps up todate. The Bureau of Ceylon Standards had put out the Ceylon Standard Specification for safety matches in boxes (C.S. 11 : 1969 and the 1st revision 1976) and attempts were made to make this standard specification mandatory. But due to poor quality of local matches, this step had to be withdrawn as this would have led to an acute scarcity of safety matches in the market. And at the same time it would become essential to import matches which ultimately would offer stiff competition to the local manufacturers.

At present monthly samples are drawn from the production lines and tested by the Bureau to study the quality of safety matches in respect of Sri Lanka Standard Specification on safety matches.



The final touches being given to the match boxes before they are ready for market.

In this standard specification requirements have been broadly classified as general requirements and defects. These defects would be either physical or functional.

A safety match is defined as the match stick which would ignite only when struck on a specially prepared chemical surface. This should ignite smoothly and evenly and should not cause splutter or explosive effect and should not produce incandescent particles. The mode of ignition of the matches have been explained as that the head shall flame without fuming or smoking and shall transfer the flame readily to the splint when held horizontally in a draught free atmosphere. When struck, the head shall not smoulder or become incandescent prior to flaming and when the flame is extinguished there shall be no afterglow of more than three seconds duration. After—glow is explained as burning without a flame after the flame resulting from ignition had been completely extinguished. This is a characteristic of good quality safety matches.

There are different requirements stipulated with regard to splints, match heads, boxes, stricking surface and contents of boxes. Again there are requirements of safety, ignition and damp proofness.

The requirements for splints are that they should be of firewood, cardboard or paper and should not be more than 1½" (38 mm) in length. They should be straight, uniform in cross section and of sufficient thickness, so as not to break when struck on the specially prepared stricking surface. The splints should be suitably treated to permit the flame to be readily transferred to the splints and to prevent afterglow.

Chemicals being painted on the sides of the match boxes by hand. Care should be taken to ensure that this application is uniformly done.

The production of splints is as indicated below:

Log cross cutting and cleaning bark band
↓
Peeling (machine)
↓
Splint chopping (machine)
↓
Splint drying (dryer)
↓
Splint polishing (machine)
↓
Frame filling and levelling
↓
Pre-heating of splints

The quality of splints contribute largely to the ultimate quality of the safety matches. And the quality of the splints depends on the type of wood used. In Sri Lanka *ruk aththana, walbiling, kekuna, and albizia,* are used for the production of splints. The wood used should be of soft variety and must be strong enough to be peeled with a sharp knife. This timber should have straight grains. Twisted grains will make the splint weak and tend to break off on applying pressure. The timber should be fully air dried so that it weighs around 30 lbs. per cubic ft. In Sri Lanka there is a a shortage of quality timber and as result of this, timber which does not possess the required properties are used for the manufacture of safety matches. The stages which govern the quality of the splint are the splint chopping and drying. Chopping has to be done to the required measurements. The drying stage plays a vital role in determining the strength and the burning qualities. In Sri Lanka splints are dried mostly in the sun and as a result weather will have an effect on the quality and the quantity of the splints dried.

The most important stage in the production of safety matches is the treatment of the splints and treatment of chemicals.

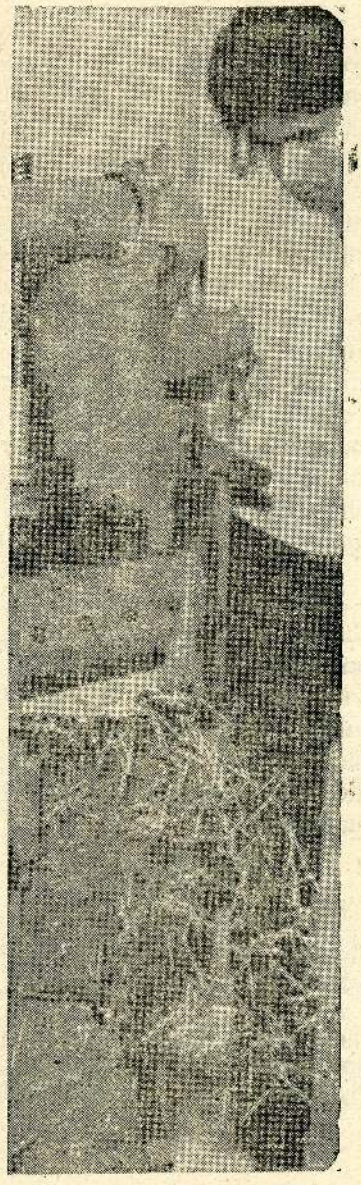
The match heads of the safety matches should be smooth and angular in shape and should show no marked variations in size. They

should be free of cracks, splints or any other defect which may adversely affect the proper functioning of matches as described earlier. The head should adhere firmly to the splint, so that when the splint is held between the thumb and the index finger of one hand and the head between the thumb and the index finger of the other and if a moderate force is applied to pull it apart, the head should not get detached.

Common defects

The common defects observed are: insufficient or no heads, badly distorted heads, fractured heads, fused heads and running heads. Badly distorted heads are those which show pronounced abnormalities in shape or surface especially sharply defined peaks. Fractured heads are those where the surfaces are broken or cracked. Fused heads are those where two or more heads are linked together by a bridge of head composition and in the running heads the head composition runs down the side of the splints.

The occurrence of badly distorted heads are mainly due to the defects of the splints. This can either be due to splints not being cut square or the ends of the splints not being smooth and as a result chemicals not adhering to the splint uniformly These situations could be avoided if the peeling and splint chopping machines are adjusted correctly. The peeling and chopping knives should be very sharp as these get blunt and a large number of defective splints will be produced. If the wood used in making the splints is too soft, the splint end may crack. This may also be due to the bluntness of the knives used. This leads to fractured heads. At the same time the fractured heads would arise due to incorrect chemical formula due to the fact that the chemicals are not homogeneous.



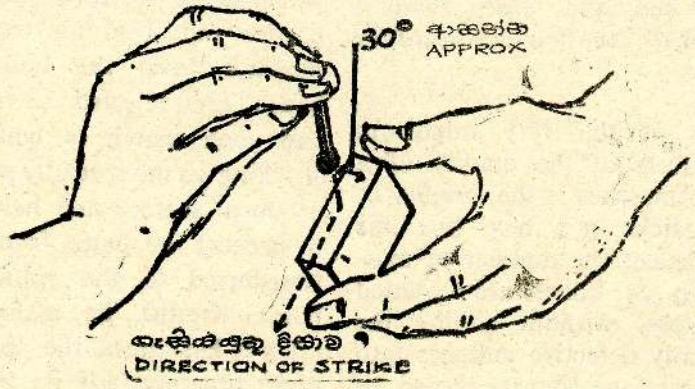
One of the machines used in cutting match sticks.

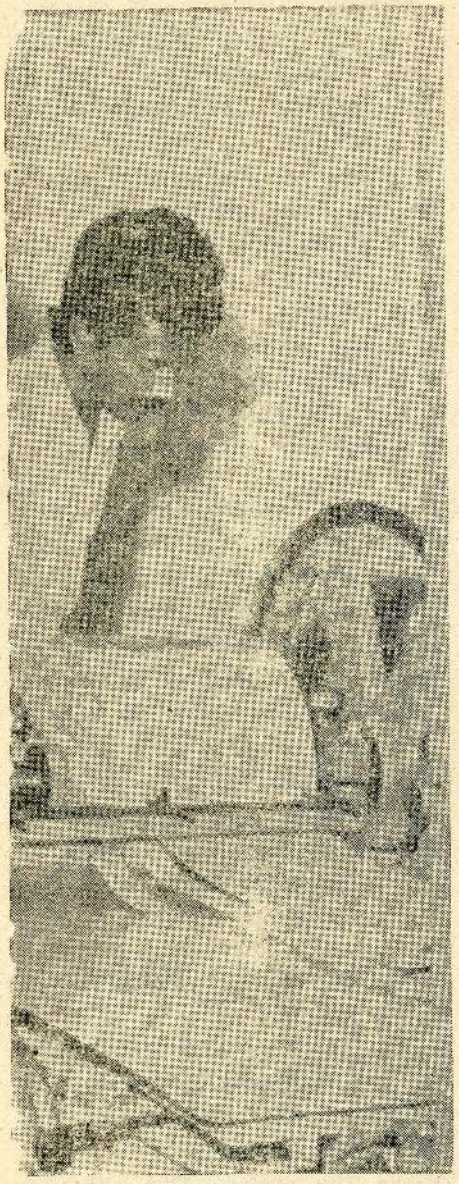
Another common defect observed is the fused head of the matches. This may be due to each splint in the frame not being properly spread out. At the same time this may be due to splints bending or touching or nearly touching in the frames. This situation could be avoided if the frames are properly constructed and the splints are checked to avoid bending or touching before dipping in the chemical solution.

Turning frames

The turning of frames upside down, after dipping into the chemical solution, will result in running heads. The chemicals tend to flow along the splint. This situation could also arise due to the composition of the chemicals being watery. This could be avoided by instructing the workers of the correct time when the frames should be turned upside down and also checking the composition of the chemicals at regular intervals.

If the splints are not properly levelled in the frames the occurrence of insufficient or no heads in the splints will result and this is observed commonly in the locally manufactured boxes of matches.





Veneering of logs—one of the many processes involved in manufacturing safety matches.

The sale of matches in poorly constructed boxes will also result in customers prefering other brands of matches. The boxes should consist of an outer sleeve and an inner sliding drawer or a tray. The box should be rectangular in shape, angular in size, well formed and of sufficient capacity to contain the required number of matches without bulging. The paper covering of the sleeve and trays should be firmly fixed. The drawer should fit in the sleeve so that when lightly held in the vertical position the drawer with matches would not fall out.

The stricking surface of each box should be evenly coated on one or both of its narrow outer faces with a mixture (referred to as side paint) which should be free of yellow (white) phospherous and should not ignite or burn following the stricking of a match. The coated surface should be such as not to tear or peel off in using. This stricking surface should terminate at least 5/64 in. (2 mm.) from the ends of the coated sides, and these should not overflow on to the broader frame of the box. The stricking surface should be sufficient for igniting 60 matches.

The match should be held as shown in figure and struck at an angle of approximately 30° with the plane of the stricking surface with sufficient force for the match to ignite (Figure indicates method of stricking matches).

Production

The production of boxes and making the stricking surface would be given as follows:

Outer box making	Side coat
Box brand	mixing
(by hand)	(ball mill)

(2)

Side coat painting (by hand)
Drying

In making of boxes, the final step of drying is usually done in the sun light, which again is governed by the fluctuations of the weather.

One of the very important parameters of the quality of a box of matches is the number of good sticks in a box. For this requirement the number of matches in 24 boxes are counted separately, without taking the physically defective matches into consideration, (but a record of each category such as broken matches, insufficient or no heads etc., are kept separately). The average number of matches per box counted this way, should not be less than 45 provided that no box contains less than 40 match sticks.

Quality

The quality with regard to safety stipulates that matches should not ignite when rubbed with slight pressure on No. 00 sand paper. For this testing 20 matches are selected at random from three boxes selected, based on the sampling plan and bulked together. Each match is drawn at an angle of approximately 30° over a strip of No. 00 sand paper laid horizontally on a Table. The length of strips should be approximately 2" (50 mm). When subjected to this test matches should not ignite.

The matches must also be tested for non-ignition at high temperature. For this requirement 10 matches are taken at random from the three boxes and these sticks are inserted with their heads up into holes approximately 3/8 in. (10 mm) apart in a wooden or metal block and introduced into an oven which is thermostatically controlled at 170° C. and maintained at this temperature for 10 minutes. And the matches should not ignite under this condition.

Testing of the matches for satisfactory treatment should be carried out. For this testing 25 matches from the bulk of 3 boxes are selected at random and each match is ignited by stricking on the specially prepared chemical surface and held so as to prevent the flame from being transferred to the splint. The flame should be extinguished after it has burnt the splint for approximately half its length.

The packing of matches for sale is also important and has to be carried out in such a way that when matches are tested for damp proofness, it should ignite. For this testing water is poured into the bottom of a desiccator of sufficient capacity till the level is about 1 inch (25 mm.) below the plate of the desiccator. The air in the desiccator should be allowed to reach saturation. The boxes of matches to be tested are half opened to expose the heads and then placed on end with the match heads up, on the plate of the desiccator near the centre. The desiccator, should then be closed and left undisturbed for two hours at noon temperature. At the end of this period these are removed from the desiccator, one box at a time and each match stick is struck not more than twice over the striking surface of the box till all the matches are exhausted or there is no more striking surface left. The number of matches failing to ingite and the number of matches remaining unlit due to exhaustion of the stricking surface should not be more than 10% and the stricking surface of the boxes should not tear off during testing.

Defects

The functional defects of the matches are categorised as:

(*a*) Fracture of splint
(*b*) Failure of match to ignite and burn
(*c*) Crumbling of the head without ignition
(*d*) Explosion of the head or scattering of hot particles on ignition
(*e*) Incandescence or smouldering of the head prior to flaming
(*f*) Excessive fuming while burning
(*g*) Failure to transfer the flame rapidly to the splint.

The fracture of the splint may arise due to the application of too much pressure while stricking the match. The failure of matches to ignite may be due to:

(*a*) weak chemical composition of the head
(*b*) chemical may not be well ground and mixed before the dipping of the frame.
(*c*) side composition of the box (paint) being not well stirred while applying the paint
(*d*) excessive moisture in the atmosphere.

Glue

The usage of inferior quality glue, which acts on the binding agent for chemical, may give rise to crumbling of the head with ignition. This may also make the head explode or scatter the hot particles on ignition. The inferior quality glue will also make the head to smoulder before catching fire. Smouldering of head prior to flaming may also be due to non-homogeneous mixture of chemical being used and the head composition may have more water and less chemicals. The presence of too much sulphur in the chemicals gives rise to excessive fuming while burning the stick. This also indicates improper checking of the composition of the chemicals. The match stick fails to keep the flame due to insufficient wax in the match splint. This situation arises when the splints are not properly dried and as a result splints will not absorb wax.

Strict checks must be maintained at the box filling stage so that boxes with few sticks could be removed.

At this stage it will be noteworthy to explain the sampling procedure to identify whether the product conforms to the national standard specification. Samples are taken from the production line at the stage of dozen packeting. 12 dozen packets are selected at random and this is taken for testing.

For the purpose of testing, boxes are selected at random from each dozen packet making a total of 36 boxes and these are sent for testing. These 36 boxes are wrapped in the same material which is used for making dozen packets and sealed and kept for 3 weeks before being tested.

For the purpose of testing 24 boxes are selected from the wrapped and sealed sample at random and tested for:

1. General examination of the boxes.
2. Examination of the boxes for physical defects.
3. Counting the matches in boxes
4. Testing of matches for functional defects.

Out of the batch of 12 boxes, five boxes are tested for the stricking surface, three boxes for safety ignition at high temperature, adherence of head to the splint and persistence of after glow. The balance 4 boxes are used to test damp-proofness.

The criteria for conformity of the requirements for boxes, splints, match heads has been explained earlier. In the counting of good sticks in a box, there must be 45 non-defective sticks and at the same time no box should contain less than 40 match sticks. When tested for functional defects, defective matches should not exceed 100 out of 200 splints subjected to test. Not more than 2 matches out of 25 tested for adherence of head to splint are allowed to fail the test and not more than 2 out of 25 should have an afterglow for more than 3 seconds. All the matches in the tested boxes must pass the test for safety and no match should ignite when subjected to non-ignition at high temperature.

National Networking: a must for industry

A practical approach to National Industrial Information Systems in Developing Countries.

Sound decision-making in industry depends, apart from the professional competence of those making them, on the information available to them regarding the latest developments in their respective activities. Even more important is the timeliness with which such information is made available, the quality of such information and the reliability of sources of such information.

This applies with far greater validity in the developing countries as they are now laying more emphasis on industry, particularly small and medium-scale industry. To these countries, this is one means of diversifying their basically agricultural economies in order to find long-term solutions to their more pressing economic problems.

It has been proved that solutions to many problems arising in small and medium-scale industrial activities do not demand original research and could be found in the already published technical literature on such aspects, provided such literature has been systematically acquired, processed and is available in a readily retrievable form. Thus, there is an urgent need to make available this information that is immediately applicable to problem solving and innovation in small and medium scale industries, among other things, if the expected development in this sector is to be achieved as speedily as possible.

Volume of Data

Today we live in an era where the volume of data and information in science and technology are increasing at an unprecedented rate, making it impossible for the professional people to keep up with the state of the Art even in their own specialisations. The flood of information coming in the form of books, journals, research reports etc. consists of current developments in the various specialised subject fields and if these professionals do not have some medium by which information pertinent to their respective fields can be obtained, they cannot be sure that they are not missing some valuable information or repeating at considerable cost both by way of time and money that which had already been well done.

by **T. T. Jayaweera,**
Public Relations Officer,
Industrial Development Board.

Valuable Asset

The process of acquisition, processing, storage and dissemination of information by means of Libraries, Documentation and Information Centres enables the conversion of this flood of information from a liability to a valuable asset. It also enables the users of information to know everything possible in their areas of interest—the most upto-date at that—and above all, to obtain the right information, at the right time and in the right form.

It is for this reason that a variety of Libraries, Documentation and Information Centres are in existence in different State Institutions, Ministries and Departments, private agencies, industries and business firms. These respositories of information with various functions, scope and levels of efficiency have been organised to meet the needs in information of the individual organizations and are in existence mainly because they appreciate the importance of information in their respective activities and also because they possess the financial resources and contacts to maintain such repositories.

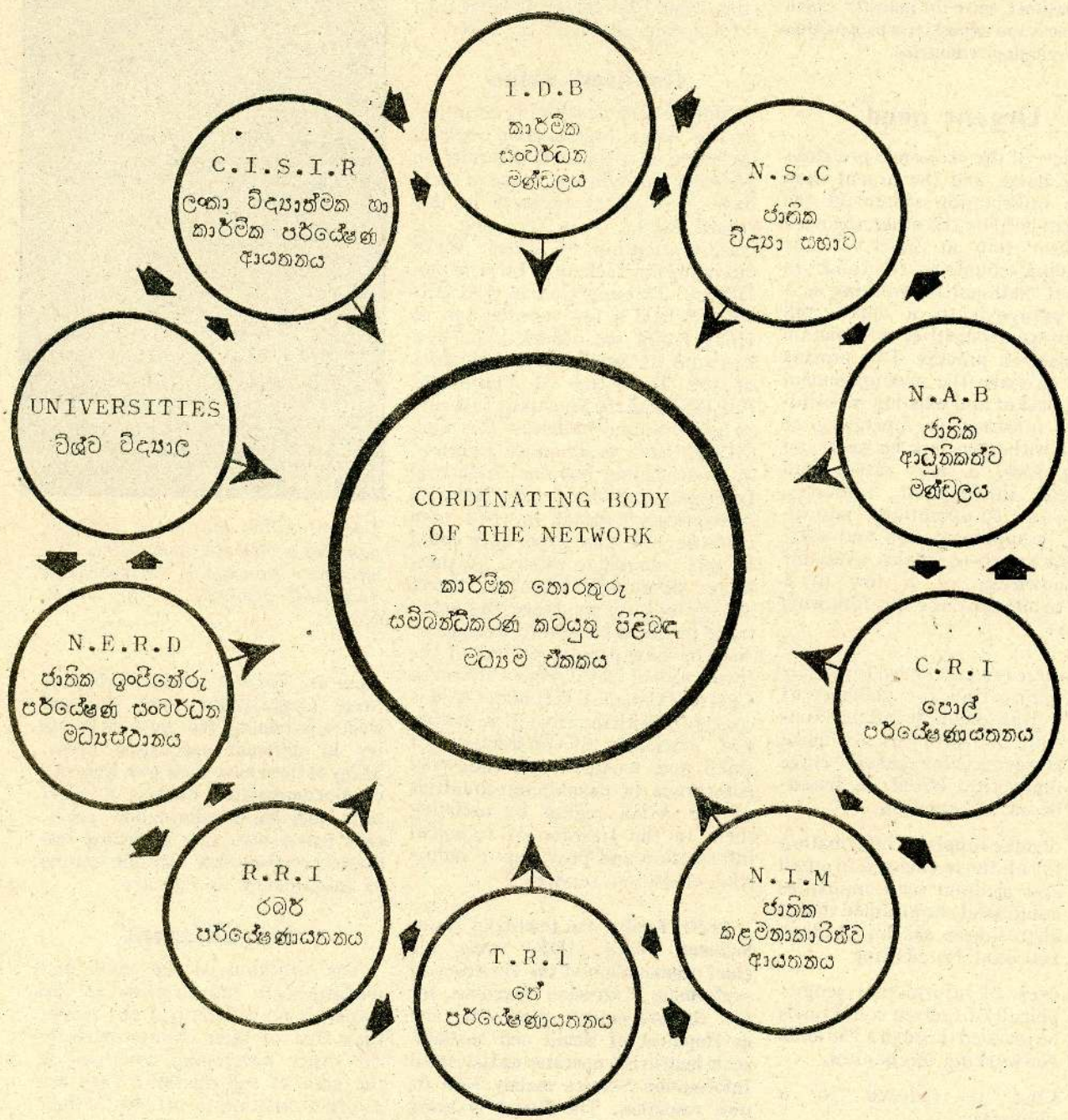
Today we live in an era where the volume of data and information in science and technology are increasing at an unprecedented rate. Thus in developing countries like ours, a national information service is essential. In this article, a practical approach to this problem has been discussed.

However, these organizations constitute a very negligible portion when compared with the entire industrial sector, the greater percentage of which comprises small and medium scale industrialists who have absolutely no avenues for information in their respective areas of activity because the great majority of them do not still appreciate the importance of information. This is quite natural, for even if they do appreciate its importance, they do not possess either the financial resources or the know-how to acquire it themselves and there exists no central organization to which they could turn to for the required information.

Desperate Need

Most developing countries are characterised by a developing agro-industrial economy and generally a wide variety of industrial and technological activity spread thinly over a vast area. They thus require different types of technical information and an effective medium by which they could easily be reached for transfer of information that they so desperately need.

What the developing countries are concerned with today, is, the creation of a channel through which these



A NETWORKING CONCEPT

small and medium scale industrialists could be provided with their needs in information. The solution definitely lies in the establishment of a National Information Centre for industry which of course is too expensive a proposition for developing countries.

Urgent need

In view of the economic pressures on one hand, and the urgent need for an information system at the National level on the other, the need has been felt in most of the developing countries to think in terms of National Networking as a basic approach to a small and medium-scale industries' information dissemination process. This process would envisage the encouragement of all relevant and existing repositories of information, operating at present without a link between and among them, to share rather than duplicate information resources, based on co-operation, coordination, complimentation and commitment so as to make available the knowledge of a few to a larger community for the following reasons:

(*a*) there is a great need for timely information for planners as well as for small and medium-scale industrialists to make better decisions and encourage innovation based on broad-based information.

(*b*) regular supply of information for all those engaged in small and medium scale industries could easily be attained through resource sharing through National Networking

(*c*) users of information geographically dispersed could easily be reached through a National Networking mechanism.

(*d*) Cost is reduced to a minimum

(*e*) duplication of effort and materials would be avoided

(*f*) external linkages could easily be made.

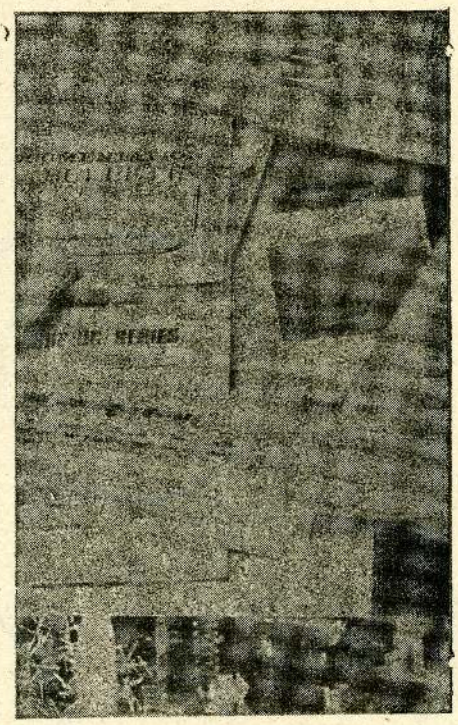
(*g*) the utilisation of existing information resources and the development of new ones could be maximised

Needless to say, participants in such a system, while contributing in a big way to the socio-economic objectives in their respective countries, would be enriching their own information resources as well.

Realised value

Many of the developing countries in the Asian region have realised the value of a National information Network for industry. Some of them have made great progress in this regard while it is receiving the closest attention of others. While attending the Technonet Information Officers' Training Course (INFOR-TRAC) held a few months ago in Hong Kong, we observed that the Institute of Small Scale Industries of the University of Philippines (UP ISSI) and the Singapore Institute of Scientific and Industrial Research (SISIR) have made much headway in spearheading National Industrial Information Systems on the National Networking concept in their own countries and their experience could be very valuable to others. Furthermore, developing countries could always look for guidance and assistance in this direction to Technonet Asia in Singapore (a project of the International Development Research Centre of Canada). Technonet Asia is concerned with improving the quality and efficiency of production of small and medium-scale industrial enterprises in developing countries of the Asian region by assisting them in the transfer of technical information and provision of industrial extension services.

In Sri Lanka, the Industrial Development Board (IDB) being the chief organization of the Government performing Extension functions for the encouragement, promotion and development of Small and medium-scale industries, operates an Industrial Information Service mainly with its own resources. The Board is being assisted by Technonet Asia both for increasing the efficiency of its Information Personnel and the service itself by providing training and access to a wealth of upto-date industrial information. The IDB being the participating Organization of Technonet Asia in Sri Lanka, is entitled to these regular services. In addition to the Industrial Development Board,



Documentation and storing information play a vital role in industry. Pictured here are some of the specialised documents available at the I.D.B. library.

there are however a wide variety of State Organizations and National Bodies promoting the cause of industry in different specialised areas. Many of them have their own libraries or Documentation Centres to meet their individual information needs. Our universities and Technical institutes are also other valuable sources of information to industry.

No different

The situation of the small and medium-scale industrialists in Sri Lanka is no different, if not worse, than that of their counter-parts in the other developing countries in the area of information. They are not in a position to attend to their own information needs and no one central organization exists which could satisfy their varied information needs. It is in this context that most beneficial results could be obtained if efforts are made to work out a system of co-ordinating with all our local organisations towards evolving a National Industrial Information Network.

Charcoal — a solution to fuel-wood problem?

By
L. C. A. de S. Wijesinghe
Acting Secretary General
National Science Council.

In Sri Lanka the primary use for heat energy in the home is for cooking. Although liquid fuel provides an important part of the energy requirements for cooking in the cities, firewood is by far the predominant source of energy in the rural and suburban areas. It has been estimated that over 94 percent of the households in Sri Lanka use fuelwood for cooking. In fact, considering the total energy consumption in Sri Lanka, fuelwood is said to account for as much as 60 per cent of it, the balance being shared by oil (28 per cent) and electricity (12 per cent).

The nation's requirements of fuelwood for home use has not been accurately assessed. However, a reasonable estimate of the consumption of fuelwood or its equivalent is 10 cu. ft. (round wood) *per capita* i.e., approximately 140 million cu. ft. per year for the country as a whole. This estimate is based on figures given in the pre-investment survey of Forest Industries Development in Sri Lanka—Final Report Vol. III. Although the estimate is that of "fuelwood", a relatively small but significant part consists of coconut shells, coconut husks and other agricultural residues.

Supplies

As against this figure, the supplies of fuelwood by the State Timber Corporation is around 180,000 cu. yds. (stacked billets). This amounts to about 4½ million cu. ft. which represents only a very small fraction of the national consumption.

Domestic Use

A large part of the fuelwood used for domestic cooking in the western and south-western parts of Sri Lanka consists of rubber wood obtained from estates taken up for replanting. This firewood is brought to Colombo and other cities by lorry, sometimes over distances of several miles. There is no precise information as to the source of the balance (about ½ the consumption). A part of it must undoubtedly come from State forests as unrecorded collections. Trees from homesteads, shade trees in estates and the like, as well as coconut shells and other agricultural residues also make up a significant part of the balance.

Besides the demands for domestic use, fuelwood is also required for numerous industries like the tea industry, the tobacco industry, brick and tile factories, bakeries, etc. No estimates of the total requirements of fuelwood for industry are available. The fuelwood required for industry is also trasported from the forest to the points of consumption, by lorry.

The Problem of Fuelwood Supplies

Nearly everyone is familiar with the complaint of fuelwood shortages and high prices. The growing shortage and the escalating prices have hit the housewife and industrialist alike. Yet, paradoxically, the value of firewood at the source is very low. The Forest Department charges Rs. 3/- per cu. yd. (stacked billets) in the dry zone and Rs. 5/- in the wet zone for firewood sold at the source in natural forest areas coming under development. The purchaser has to bear the cost of felling the trees and converting the material into firewood billets; but even reckoning with his additional cost the price is low.

Reforestation

In natural forest areas taken up for reforestation with plantation species (like teak) some of the felled material should be left at site to provide a good burn which is a prerequisite to successful reforestation. However, a fair quantity of firewood would be removed from such areas without in any way adversely affecting the burn. But what now happens is that in many of these areas no firewood is extracted at all because the cost of transport to the centres of consumption is prohibitive.

So much for the cost of firewood at the source. This intrinsically low value commodity, fetches a high price in the market. In Colombo and its suburbs firewood

is sold at Rs. 9.00 per cwt. which is equal to about Rs. 50/- per cu. yd. (stacked billets). In other parts of the island the price ranges from Rs. 20/- to over Rs. 40/- per cu. yd. (stacked.). Its high price and scarcity in the market compared with its low value at the source is due to the high cost of transport. The escalation of transport costs is mainly due to the following factors:

(*a*) the shortage of transport vehicles for all types of transport as a result of the high capital cost of vehicles coupled with the increase in the cost of spares, tyres and diesel oil

and

(*b*) the forests getting more and more remote from the urban areas and other centres of development as a result of continued forest clearing. Taking an example of this, the tile factory at Illayapattu, about 10 miles from Anuradhapura, once surrounded by forest, is now experiencing difficulty in obtaining fuelwood which has to be transported over several miles.

Alternative

In a situation where energy is in short supply, and the feasibility of using alternative sources are to be explored, one tends to visualize the possibilities offered by biogas, wind, solar energy collectors, ocean thermal energy conversion and nuclear power. No doubt these are important sources of energy that could be harnessed in due time. But pre-occupation with the development of these technologies should not blind us to the fact that there is a readily available source of energy in the country that, if properly utilized, could enhance the availability of fuel for domestic use and for light industries. The writer refers to the use of charcoal converted from wood. Charcoal has a much higher calorific value, weight for weight than the wood from which it is produced. It will therefore be far more profitable to convert wood into charcoal at the source and to transport the charcoal to the consumption centres than to transport the fuelwood. This would make it possible to use a good part of the fuelwood that would go waste in areas being cleared for development due to transport costs being prohibitive. With the accelerated pace of land-clearing under the Mahaweli Development Project, there is no time to waste in commencing pilot scale projects for the production of wood charcoal.

Portable kilns

Wood can be carbonized by controlled combustion to produce charcoal. Charcoal produced from wood is widely used as a source of energy both for domestic heating and for cooking in many developing countries like Thailand, India, Uganda, etc. Carbonization may be done by firing in kilns or retorts, and portable kilns built out of steel are used in several countries. However, long before portable kilns were used charcoal was produced in cheap brick and earth kilns, and these are still widely used because of the low capital cost.

Fuelwood is cut into billets and air dried for some days. It is then stacked in the kiln, and the stack is fired and allowed to ignite under restricted supply of air. A worker experienced in charcoal burning can easily detect when carbonization is complete, at which stage the air supply is completely cut off. The carbonized wood is removed from the kiln after it has cooled.

Most species of hardwoods and softwoods are suitable for charcoal manufacture. First thinnings of plantations where the yield is in pole sizes that have no ready market can very economically be converted into charcoal, so enhancing the value of the material as a fuel.

What are the special advantages of charcoal over wood fuel ? To start with, in carbonization, the water which comprises more than 1/3 the weight of the fuelwood is expelled. As commercial charcoal contains very little water, the expulsion of water alone affects a considerable saving in the cost of transport. This is not all: although a part of the carbon is lost by oxidation in the processes of carbonization, the charcoal produced is about 98 per cent fixed carbon as against 35 per cent in fuelwood.

If retorts are used for carbonization, volatile substances from which products like methyl alcohol, acetic acid etc. can be fractionated are evolved. However, this refinement in the method of manufacture cannot be accomplished for the present.

Commercial wood charcoal is a *high energy fuel equal to that of good quality coal.*

Weight for weight, charcoal can yield two to three times the quantity of energy as partially air dried wood which is now transported to the markets. Considering that wood can be converted into charcoal at a very low cost and in the forest itself, the saving to the national economy in transporting charcoal instead of fuelwood can be quite considerable, and this is the biggest single factor in favour of producing charcoal commercially to replace fuelwood in many of it uses. Neither is any advanced technology needed for its production as is clear from the foregoing account. Ordinary unskilled rural workers can be trained in charcoal making. What is needed is the ability to construct the brick and earth kiln, to convert the firewood and stack it within the kiln, and to recognize the stage at which carbonization is complete. None of these basic skills is alien to our rural population.

Advantages of Developing a Charcoal Industry

From what has been stated above it is clear that the primary advantage of using charcoal as a fuel instead of using the wood directly is the considerable saving in the cost of transport. As charcoal contains 2 to 3 times more energy than partially dried fuelwood, the transport of an equivalent amount of energy is 2 to 3 times cheaper with charcoal than with wood. Consequently much of the timber now left to waste in the forest because of the prohibitive cost of transport could be profitably coverted into charcoal and transported for use as fuel both for industry and for the home.

Risky

Even for the towns in the South and South West parts of the country it would be risky to continue to depend almost entirely on rubber wood for fuel. For one thing the supplies of rubber firewood may not continue at the present level with alternative uses for rubber wood growing (e.g., boron treated rubberwood) and for another, the demand for fuelwood is likely to increase with increase in population.

Charcoal will be useful as a domestic fuel not only in the towns and suburban areas but also in major settelement schemes such as in the Mahaweli Project area. With widespread clearing of forests and over 1 million people eventually settling down in the Mahaweli Project area the fuelwood question is bound to loom large. In fact the settlers in Kalawewa even now express concern about continuing supplies of fuelwood. The fuelwood will have to be eventually supplied from natural forests and forest plantations outside the Project area. This would mean costly transport, and hence the undoubted advantage of charcoal over the direct use of wood.

Other Benefits

Some of the other benefits of developing a charcoal industry and switching over to using charcoal instead of firewood are as follows:

(*a*) Charcoal is a smokeless fuel and hence would be more attractive for use both in the home and in the factory, unlike firewood it does not cause air pollution.

(*b*) The social benefits that will result from increasing employment in the rural sector. Developing the charcoal industry will make an important contribution towards developing the rural economy with very little capital costs and without the use of any advanced technology.

(*c*) The national economy will also benefit by the production of a cheaper fuel to the consumer and by the release of a number of transport vehicles for alternative uses.

(*d*) A part of the timber that is now unutilized in natural forest areas coming under development could be converted into charcoal which would make its transport to markets profitable.

(*e*) Industries such as the steel plant and the proposed Titania slag plant could obtain at least a part of their requirements of charcoal if not all of it from local production.

It may be questioned whether there would be consumer resistance to the use of charcoal in place of wood for cooking. It is doubtful whether there will be any strong consumer preference for fuelwood particularly if the commodity is in short supply and an alternative is available and at a cheaper price. One recalls how saw dust and paddy husk stoves caught on in Colombo as an answer to the fuel shortage. Unlike taste in food there is no strong consumer preference for the source of energy to make the food, provided it is available at a reasonable price. In industry too the efficiency and suitability of the product would be the criterion, and in this respect charcoal should be preferred to fuelwood.

Pilot project

What could be done straight away is to obtain the services of an expert on charcoal production through the good offices of the Food and Agriculture Organization of the United Nations. Pilot scale projects for the production of charcoal (located in forest areas) could then be started without any delay as feasibility tests on the suitability of local species for charcoal production are not an essential prerequisite; nearly any forest species produces charcoal of acceptable quality. After observations are made on the pilot projects and on the use, distribution and marketing of charcoal, production can be rapidly expanded.

It is suggested that a few lower level techniques including workers skilled in the construction of brick kilns and in the production of charcoal be obtained through the F.A.O. from a country with a long tradition of charcoal burning. They would be useful for imparting their skills to local workers.

Once the pilot projects get underway market promotion for the use of charcoal in industry and in the home should be actively carried out. This will pave the way for production on a commercial scale.

NEW FERTILIZER PROCESS

— *a breakthrough*

UNITED NATIONS—Scientists have achieved a major breakthrough in understanding nature's processes of fertilizing soil thus setting the stage for reducing the dependence of poor farmers on artificially produced, and expensive, nitrogen fertilizers.

For the first time a team of researchers working at the international Rice Research Institute (IRRI) in the Philippines have quantified the amount of nitrogen fixed in the soil by free-living bacteria. They demonstrated that such free-living bacteria growing around the roots of rice plants enrich the soil with as much as 10 to 21 kilograms of nitrogen per hectare during one growing season.

Without the proper fertilizers the world cannot feed the 600 million persons estimated by the World Bank to be without adequate food. The high-yielding varieties of rice that have successfully increased rice harvests are especially dependent on fertilizers.

Forward

This leap forward in understanding the processes of nitrogen fixation in the soil was accomplished by a group of scientists from IRRI, Cornell University and the Boyce Thompson Institute of Yonkers, N.Y. working under a $ 1.3 million grant from the United Nations Development Programme (UNDP).

While other research institutes are investigating the biological fixation of atmosphereric nitrogen by tropical legumes and, certain non-legumes IRRI at Los Banos has concentrated its research on rice and the role of blue-green algae and certain bacteria living in the rhizosphere of the rice plant.

Over many centuries farmers, especially in China and Vietnam, recognised the value of the azolla plant, a water fern, that multiplies rapidly in flooded rice paddies, often before the growth of the rice plant. Farmers encouraged the growth of this plant in the fields, often cultivating azolla in small ponds and replanting in the rice fields. They knew that the azolla plant increased rice production.

Later, scientific research showed that the blue-green algae that lived in the tissues of the azolla plant converted atmospheric nitrogen into easily utilizable forms in their cells. When the plant died and were mixed with the soil and decayed, their nitrogen was transferred to the soil.

Past research

Past research had also demonstrated that free-living bacteria in the rice root zone were also able to fix nitrogen in the soil. But little was known about the nature of these microbes or the amounts of nitrogen fixed by them. Investigators wanted to find out, among other things, if the free-living bacteria worked better and produced more nitrogen in the presence of specific strains of rice.

If that could be proved, farmers who could not afford fertilizers could be encouraged to plant those strains of rice which obtained more natural nourishment from the soil.

Although scientists have for a long time recognised the nitrogen-fixing capacity of bacteria living in the nodules on the roots of soyabeans, peas and alfalfa, it was thought that the free-living bacteria in the soil were of only very minor importance for cereal crops. The recently concluded research proves otherwise.—(Courtesy—UNDP).

Foreign News

Nature

For some time it has been scientifically shown that nature is the most prolific producer of nitrogen, one of the essential elements for the growth of plants. Whereas in 1978 the world industrial production of nitrogen fertilizers reached 44 million metric tons, free-living bacteria, blue-green algae and symbiotic bacteria living on the roots of leguminous crops such as soyabeans, peanuts and grasses were responsible for about 170 million metric tons of nitrogen fixed in the soil.

Dry Press Method for Brick-making

By P. L. Paramani

Though the Central Building Research Institute at Roorke has been doing some development work in the field of clay building materials, the benefits of the same have not percolated to any appreciable extent, to the spheres of production, particularly in the Southern region, due to lack of promotion work and doubts regarding the efficiency and viability of the recommended techniques.

It will be worthwhile here to go into the basic technical aspects of traditional brick making in south India. Whatever be the type of soil used, there are four distinct stages of production—preparation, shaping, drying and firing. Every stage is carried out without mechanical aids. The clay mixture is prepared by trampling and this naturally means working with a very soft body. From the point of view of quick and easy hand moulding, this is an advantage, but as regards drying this creates a lot of problems. Larger quantities of water in the moulded brick means longer period of drying and higher levels of shrinkage, resulting in either cracks or marked distortion or both. However, with the addition of larger proportions of sand to the soil, if the same carries a comparatively large plastic clay content, or by selecting suitable sandy soils, drying difficulties can be overcome to a great extent.

Workability

From the point of view of easy workability and elimination of cracks during drying, the traditional brick-maker is entirely dependant on the leanness of the soil. He usually makes an attempt to stretch this condition to the maximum degree possible so that moulding and drying can be done straightway in the hot sun. This is one aspect of working, that brings down the cost of production to a considerable extent, because this helps in eliminating the heavy investments that are necessary for machinery, drying sheds, drying equipment and other related requisities needed for machine-made bricks. Other marked advantages are easy shifting of production sites, depending on the availability of soil and market demands, with the minimum possible dislocation in production and expenses.

Traditional

The traditional brick maker knows his limitations in producing quality bricks. He has come to realise, that by adopting at least some modern methods, he can make considerable improvements in quality.

All the large units which have taken up mechanised production make use of the 'wire cut' method for shaping bricks. For this, the body brick extruded from the pug mill will have to be worked in a plastic condition and there are marked limits beyond which the water content in the mixture cannot be reduced, to get the optimum workability in extrusion and cutting. Under this condition of working the disadvantages of higher levels of shrinkage and longer periods of drying still exist. This attempt therefore, should be to adopt a technique, where the disadvantages inherent in the wet process are eliminated or reduced to the minimum possible levels.

The best possible technique, will be to shape the bricks, tiles or other similar articles by compressing the body in the form of a damp 'dust' or 'powder'. This method of shaping, known as dry pressing or 'pressing is not new to the ceramic industry. In all probability the clay industry might have adopted this method, long ago from the 'tabletting' technology of pharmaceuticals. This method of shaping is made use of in metal forming also for the past many years known as 'powder metallurgy'. The process as such, is not very elaborate and can be successfully exploited for the production of a variety of clay building materials, including bricks with high levels of quality and efficiency.

Not restricted

In dust pressing the limitations in the choice of raw materials, are not restricted to the same degree as in the conventional mechanised process. It has an advantage because the formation does not depend on the inherent or simulated plasticity of clay. With high pressures the desired consolidation can be obtained and the problems of drying are also almost totally absent, because of the very low levels of moisture incorporated in the body during formation.

Naturally this reduces shrinkage and helps in the production of articles, with high degrees of dimensional accuracy, with sharp edges and smooth surfaces.

When the articles are dry pressed they come out from the machine in a hard condition with no possibilities of deformation, even if stacked very high. Pallets and shelves which form important accessory equipment, in the conventional plastic processing, become redundant. Floor space for drying under natural conditions can be reduced phenomenally thus scalling down capital costs and conveying expenses.

The question, however, arises, as to whether a switchover to the dry press method is feasible. The anwser is yes, from technical considerations.

(condenced from 'The Hindu')

Human element—*a vital parallel requisite of Industrial extension*?

The task of industrial extension in any country or part of Asia is so vast (the needs so urgent and the manpower ranks so thin) that the concentrated training of suitable personnel is the only solution. Experience is the best developer of abilities—but training can help.

Not long after the Board approval and initiation of Industrial Development Research Centres (IDRC) TECHNONET. ASIA Project in Asia in 1972 it became clear that the successful adaptation and application of technical and technological information in the development of cottage, small and medium scale industries would hinge, as all things ultimately do, on the human element and the concept of the '*Industrial extension worker*' or '*officer*' was established as a vital parallel requisite to the development of industrial (technical) information resources and networks.

by **William J. Gall,**
Deputy Administrator,
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Research Centre.

CONTACT

The extension worker was seen as a person preferably, but not necessarily, technically trained who, in his work for a body directly concerned with small industry development, would keep continual contact with a series of plants which would have a limited number, if any, of technically competent persons. He would be a generalist in the sense that he would be able to guide the entrepreneur to specific sources of assistance in fields in which he was not expert, but he would hopefully also have his own areas of (technical) interest and strength in which he could give in-depth advice and assistance.

His role, fully practised, is a complicated one in that, above all, he is continuously dealing with people and against the total spectrum of industrial activity and need. It may though, for simplicity, be viewed as having three principal aspects namely —identification, resolution and application.

He must be able, upon investigation, to isolate and *identify* the key problem(s); gather or cause to be collected, analysed, distilled and "repackaged" as necessary the relevant and pertinent information required to *resolve* the problem(s); if necessary, help *apply* the new information, or guide or advice on its application, to achieve the improvement desired.

NEW CONCEPT

'Industrial extension' is a fairly new concept and a phrase, and the debt it owes 'agricultural extension' must be acknowledged. There is a basic difference, however, between the understanding and use of 'extension' in industrial and agricultural spheres. In agriculture the extension worker is generally disseminating specific information, or advice or guidance pertaining to a specific seed, crop, fertilizer, etc. In industry he must first diagnose the problem—then prescribe the medicine to cure. Not that the agricultural extension worker does not also diagnose and prescribe, but it is normally in the context of expanding the production of a known product. The industrial extension worker generally begins action after receiving a not too specific call for help and must first don the cap of the detective and diagnostician.

BRIEFLY

This leads one to consider "what makes a good industrial extension worker"? and this may be approached by looking briefly at the profession of "industrial engineering", and making the statement that: "An extension worker may well be an industrial engineer, but an industrial engineer is not necessarily an extension worker".

TECHNONET ASIA's experience proves, that while a sicentific or technical background is an obvious assest to our extension worker, since he is consequently 'more at home' with industry, it is not a pre-requisite *Sine qua non*. As with the industrial enterpreneur, it is those inherent qualities of character that presage the person's degree of success.

The task of industrial extension in any country or part of Asia is so vast (the needs so urgent and the manpower ranks so thin) that the concentrated training of suitable personnel is the only solution. Experience is the best developer of abilities—but training can help.

The development of a regional industrial extension training course (subsequently code-named INDEXTRAC) for personnel of TECHNONET's participating organizations was begun on an urgent basis and the first two-month course was held in 1974 at the Small Industry Extension Training Institute (SIET), India. SIET was a logical base to begin such training as it, along with Indian's state-wide system of Small Industries Service Institutes of the Ministry of Industry and Civil Supplies, comprise the largest group of personnel involved in extension in South and Southeast Asia if not the world.

PILOT COURSE

The pilot course which catered to 10 participants was felt to be too heavy on the theoretical side, and in subsequent two-month courses at least half the period has been devoted to actual in-plant work. The second INDEXTRAC was also held at SIET in 1975; the third an *ad hoc* one was conducted in Ottawa, Canada, by the Technical Information Service of the National Research Council (NRC/TIS) which has been active in providing information as well as extension services to Canadian small industries since World War II, and has provided backup for TECHNONET from the first; the fourth and fifth in 1976 and 1977 were conducted by our participating organization, the University of the Philippines Institute for Small-scale Industries (UP ISSI) reflecting TECHNONET Council's decision to move towards self-reliance within the network taken at its 1975 meeting (and further emphasized at its 1976 and 1977 meetings).

To develop the capacity of the TECHNONET Organizations to proceed logically, as quickly as possible, to the ultimate goal of conducting their own local INDEXTRAC's in their own language, a Trainer's Training Seminar was conducted by personnel of our two Philippines TECHNONET organizations—UP ISSI and the Economic Development Foundation—for potential trainers from the 11 participating organizations in 1977.

Then in 1977, Sri Lanka held the first local INDEXTRAC, followed that same year by Thailand and Indonesia.

LED THE WAY

In January 1978 Sri Lanka again led the way with the first "Special Technical Extension Workshop" (STEW) based on fruit and vegetable processing.

Another regional INDEXTRAC has been held in the Philippines in 1978. Up to this point about 190 TECHNONET PO personnel have been exposed to the 11 INDEXTRACs and the Trainers' Training Seminar.

Thus, in four years the concept of industrial extension has taken hold and training activity heightened to the point where the most-concerned TECHNONET organizatians are now conducting their own local courses, in their own languages, designed to satisfy their national industrial development needs.

RECENT YEARS

Recent years have brought the phrases *appropriate technology*, *transfer of technology*, *rural development*, *village technology*, *information network*, *low cost technology*, etc. increasingly into use. In many cases the implication has been that a new concept, rather than a new thrust or approach, based on known principles has been created.

None of these approaches to the solution of old or new problems will be of any use, of course, without the *appropriate* human element in the right quantity and of the right quality

KARMANTHA

Editorial Note

The journal is a means whereby information on innovations, inventions etc. are communicated to the industrial sector. Besides highlighting the latest technological developments through articles, the journal carries information on processes, utilisation of raw materials etc.

Contributions are invited on industrial development and related aspects. Articles based on factual data, research work and surveys are welcome.

Contributions could be from research workers, entrepreneurs, educationists or any others interested in the industrial field.

Published contributions would be paid for. The amount payable would be decided by the Editorial Board.

HOW USEFUL IS A SMALL INDUSTRY?

One of the many small industries found in Sri Lanka today that provide the much needed avenues of employment to our youth

The promotion programmes for small and medium firms are intended to help attain objectives of economic and social policy in the country concerned. Therefore, the executive agency for promotion measures must be in a position to show currently that it is making contributions towards the attainment of these objectives.

Important Criteria

The most important criteria for appraising the contribution of a promotion programme for small and medium sized firms towards the attainment of over all economic targets, its usefulness for development and its economic benefit (with a view to the need to improve living conditions, branches of industry, whose production serves the needs of large layers of the population should be given special attention in deciding on promotion measures) are mentioned below:

●

—The number of productive jobs newly created and of existing jobs now safeguarded.

●

As a rule, preference is to be given to enterprises in which it is possible to expand or improve production with little capital input per job, and to areas with much open or latent unemployment. In regions with little entrepreneurial potential, an additional priority task will be to seek to increase the number of enterprises, suspending temporarily the efforts to improve productivity, if necessary.

—Favourable ratio of additional value creation initiated to input for promotion.

●

In the long run, the resulting additional value creation must be several times as large as the input for promotion. To be included in the calculation are linkage effects on other economic branches whose development possibly depends on their working as sub-contractors or on the processing of these products by the industrial sector. An additional value creation cannot be achieved solely by import substitution or export efforts. It may be that an equal or even higher contribution can result from meeting latent domestic requirements for new products which for reasons of purchasing power, transportation or other, do not appear in the import lists.

●

—Budget revenue exceeding budget expenditures in the long run.

●

The promotion input from official funds should in the long run, be compensated by increased tax revenue resulting from the promotion measures. Here, too, attention is to be paid to linkage effects.

●

—Possibilities of improving the regional and industrial structures (diversification).

●

To be promoted are in the first place economically underdeveloped or unilaterally structured areas, provided that the economic (especially demand,

purchasing power) and infrastructural prerequisites are given for a number of enterprises sufficient to justify starting a promotion programme.

●

—The outlook for increasing quality and productivity.

●

Improvements in quality are a prerequisite for preserving existing jobs and creating new ones, because higher productivity is of decisive influence on the cost and price level and hence on sales opportunities. Therefore, improvements in productivity are to be sought especially in areas, in which it may be expected that reduction in costs and accordingly in prices will result in increased demand (high price elasticity of demand).

The sequence of criteria given here does not necessarily reflect the order of priority. Top priority is clearly to be given to the creation of employment. Moreover, the order of priority should be determined by the overall requirements of the region or the country concerned.

Objectives

The overall economic objectives to be achieved by the promotion of small and medium sized industries cannot be directly expressed by operative targets of the executing agency at the level of programme elements. (e.g., extension service, granting of credits). If results in attaining overall economic objectives are not satisfactory, the causes for this can, therefore, not be traced back to the level of programme elements or of the general conditions of economic policy; i.e. the simple identification of weak spots which is possible in many technical and economic systems is without object here.

Therefore, a specific target reference system to monitor results must be formulated at the level of programme elements. It has, for subsequent periods of time, to provide information about the direction, intensity and efficiency of the activities, thereby permitting a correlation of their effect on the achievement of the macro objectives, and vice versa.

Results

To be a real planning and control instrument, this operative objective reference system must start out from the problems and deficiencies of the small industry concerned which were found out when the programme was set up. Yardstick for the appraisal is the degree in which the deficiencies found were eliminated or reduced in conformity with the situation and at reasonable cost. (comparison of the relative number of deficiencies or problems identified in the various advising periods in firms worth promoting, using notes taken on visits to plants, on number of counselling hours and costs by lines of activities on training hours imparted (and costs) or credits and on information given all this broken down by problem areas. e.g. right use of tools, procurement of materials).

It is difficult to determine exactly the contribution made by a promotion programme for small industries towards the attainment of overall economic objectives. Even so, an attempt should be made to quantify results so that the quality of the planning and the outlook of the programme becoming a success can be judged and the targets for the various successive parts of the programme can be set and controlled.

Depending on the way in which the question is put (whether the programme was a success from the business-administrative, general economic or socio-economic point of view) different indicators must be used. Just which indicators are to be used in the specific case (e.g. annual growth in percent of the value creation, average value creation per employee, average investment cost each newly created job) depends on the type of question raised regarding the specific programme and also of the availability of data. In the interpretation of actual figures, caution should be used. Impulses, for, or obstacles to growth initiated by alien factors can distort results in either way.

(*The Hindu*—4-10-1978)

METALLISED POLYESTER FOR PACKAGING

In the last few years the role of metallised polyester film in packaging has been prominently displayed at various international packaging exhibitions.

Plain metallised polyester film can be used for tea chest linning, sweet wrappers, decoration etc. Metallised polyester laminates can be used in confectionery, soap wrappers, battery labels, shopping bags, unit tea and coffee packs, pharmaceuticals etc.

Some of the major advantages of this film are:

Although the cost of films is 4-5 times that of plastic films, the all in-cost of using metallised polyester laminates is often less than conventional laminates. In most cases metallised polyester is used in a 2 ply structure that can replace a 3 ply structure. Superior light and oxygen barrier properties at various levels of ohms of resistance. This property gives longer shelf life (more than 12 months) to products; High degree of flexibility in the laminates gives better machineability on packaging machines.

Rs. 4,364,762 given as loans

Rs. 4,364,762/- has been released as loans to small-scale industrialists during the January to August 1978 period under the Credit Scheme operated by the Industrial Development Board, in association with the People's Bank, Bank of Ceylon and the Development Finance Corporation. These loans have been released for the establishment of new industrial units and expansion and modernisation of existing ones.

New approvals

Over 50 new small and medium-scale industrial units have been approved by the Local Investment Advisory Committee (LIAC) of the Ministry of Industries & Scientific Affairs during October 1978.

NEWS ROUNDUP

Rubber compounds popular among industrialists

The Central Dry Rubber compounding unit of the Industrial Development Board has sold Rs. 211, 275/- worth of Black dry rubber compounds and Centrifuged latex to small-scale rubber goods manufacturers during the January to September 1978 period. This unit is located at 156/71, Negombo Road, Peliyagoda.

A second compounding unit

Work on a unit for the distribution of Coloured dry rubber compounds and compounded latex is nearing completion. This unit, which had also been set up by the Industrial Development Board will be located at its Head Office premises at Katubedde.

Feasibility studied

Feasibility studies are being conducted by the Industrial Development Board on setting up of small-scale industrial projects using local raw materials.

The present studies include three Research Projects on the manufacture of Stearic Acid from Rubber Seed Oil, Vegetable Dyes, and Lime plaster and Magnesium from Dolomite and six Experimental Projects on the manufacture of Filler from Paddy Husk, Carbon, Black from Waste Oil, Rammed earth bricks, Essential Oils from Clove, Leaves, Animal Feed and Agar-Agar. These studies are directed by the specialised Extension personnel of the I.D.B. As far as the Research projects are concerned, studies are being made in association with Colombo and Vidyodaya Campuses of the University of Sri Lanka.

Not within a radius of five miles

The Local Investment Advisory Committee (LIAC) of the Ministry of Industries & Scientific Affairs has decided to comply with a decision of the Urban Development Authority not to approve the location of industrial units within a radius of 5 miles from the proposed National State Assembly building at Kotte. This decision has been necessitated in order to facilitate the planned development of the area immediately surrounding the new National State Asesmbly building. A decision of the Committee not to approve the location of units within a radius of 20 miles from the present National State Assembly building in order to facilitate the regional dispersion of industry is already in force.

Greater Colombo Economic Commission (GCEC) in relation to Small and Medium-Scale industries

Industries established outside the G.C.E.C. area of authority seeking concessions as G.C.E.C. licenced enterprises should be recommended by the relevant ministry to His Excellency the President, who if he agrees, would direct the G.C.E.C. to take appropriate action. This will also apply to industries that are already existing within the G.C.E.C. area of authority and have not been licenced by the Commission. Industries to be located within the G.C.E.C. area of authority should obtain approval of the Commission for their location and the Local Investment Advisory Committee (L.I.A.C.) of the Ministry of Industries and Scientific Affairs will grant approval for their establishment subject to approval of the G.C.E.C being obtained as far as the location is concerned.

Precision Performance

The Union C15 counter scale

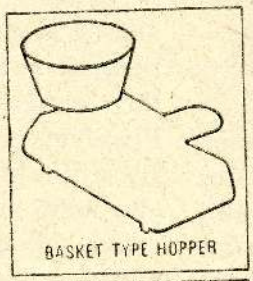
The Samuel, Sons Union C-15 Counter Scale takes pride of place as being the first ever Counter Scale designed and produced in Sri Lanka.

The Union C-15 is rigidly constructed and designed for maximum stability, performance and trouble-free operation. The consistency of precision through rigid quality control at all stages is matchless.

The Union C-15 is finished in a choice of two attractive colours - metallic gold, and matt-black. The heavy gauge galvanised iron 'hoppers' are available in the standard 'Scoop' type as well as 'basket', flat-base and 'pan' type.

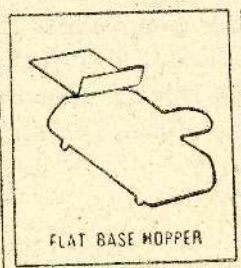
The capacity of the Union C-15 Counter Scale is 15 kg/28 lbs. A set of Imperial or Metric Deadweights are supplied at extra cost.

The Union C-15 is approved and stamped by the Warden of Standards, Weights and Measures Division of Sri Lanka.

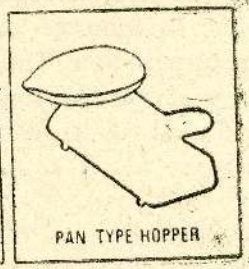


BASKET TYPE HOPPER

SCOOP TYPE HOPPER



FLAT BASE HOPPER



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Cocoa Foliage to Sustain Goats

Cocoa, an exotic crop, is becoming popular in Kerala as a remunerative intercrop in coconut plantings. So are goats thanks to schemes for amelioration of small farmers and special projects for upgrading the local types.

Goats being voracious consumers of any green stuff, it has been recommended to stall-feed them as they will destroy all worthwhile vegetation if let loose to fend for themselves. The need has therefore arisen for choice of plants and trees which have a surplus of foliage fit for these quadrupeds.

NO DEARTH

With its rich tree wealth, Kerala has no dearth of this feeding material. The latest addition to the foliage yielders for goats is cocoa.

The fruit husk of cocoa has been found to be an excellent food for milch animals and their leaves are well relished by goats. Seasonal pruning is needed to keep the trees in good trim and inducing maximum pod-formation. This suits farmers who rear goats.

The novel use of cocoa leaves to feed goats was discovered by a 61-year-old farmer in Adichanalloore near Quilon. He has been using this diet for goats for the past five years with good results and without any mishaps. The supply is obtained from his 40-tree plantation.

According to Mr. R. Hali Principal Information Officer, Farm Information Bureau, Trivandrum, several farmers are at present wasting cocoa foliage by using it as a leaf-mulch. This can be a source of income if they time the pruning and sell it to others who own goats.

Cocoa yields chocolate for children and their leaves may well be as much delicious for goats used to feeding on various rough foliage types.

(*Source—The Hindu*)

Device to Detect Cow's Pregnancy

An electronic device has been produced in the United States which detects pregnancy in most of the breeds of cows after 30 days. The accuracy levels of this gadget is more than 90 per cent.

Working on the sonar principle, a flat, external sensor is pressed against the skin through an oily coupling fluid. The very small energy sent out from the device is reflected from different internal tissues and body structures.

The reflections are shown as spikes on a screen which shows the position of organs. The location of the spike indicates whether the cow is pregnant.

The cow prognostication does not pose any health hazards for the animal. It will just help the veterinarian to sort out the pregnant cow from the open ones.

But it cannot indicate whether the cow has twins. This has to be determined by the veterinarian

(Source—*Hindu*)

Fall in World Sugar production?

World sugar production this marketing year is expected to fall 2 percent from last years' record—the first decline since 1973-74, the year in which high sugar prices pushed up production, the US Agricultural Department said.

Early estimates show that production in the marketing year ending this September 30 will total 90 million tonnes.

Production is expected to increase in the Soviet Union and Africa but decline in S. America, Europe, Oceania and Asia.

(*Business Times*)

Some Viable Projects to suit you

The Industrial Development Board in an endeavour to encourage, promote and develop small-scale industry, from time to time introduces to prospective entrepreneurs viable projects by way of Project Reports.

So far, nearly 50 such project reports have been published and among them are the reports on the following:

Coconut Vinegar, papain, peanut oil, sugar cane Jaggery, Manioc Starch, Mushrooms, Cheese, Radio repairshop, Soap (washing) Banana fibre, Coir, Fibre, Bees honey & wax, Sago, Open pan sugar, Cutting &Polishing of semi-precious Stones, Modern blacksmithy, Modern Carpentry shop, Seri-culture, Palmyrah Fibre Grinding Mill, [Tumeric powder) Smoked fish, Non-ferrous foundry, Roofing tiles, Nata-de-coco, Sugar cane juice (for drinking purposes), Tammarind concentrate, Spice oil, Musical instruments, Cadjunut shell liquid, Rice milling, Coir ropes, Manioc starch (Small scale) Cashew processing (kernels) Baking powder, Electric immersion heaters, Hot plates, Kettles, Burnt building bricks (conventional type), Tooth powder ,Workshop for Motor Vehicle repairs & Agricultural implements, Distemper, Sports goods, (Leather) Modern Pottery manufacture, Fertilizer, Mixtures, Low cost rice mill, Roasted peanut, Brick manufacture (wirecut type) Metal crushing (unit crushers) and Metal crushing unit (Single Crusher)

These Project Reports are essentially model reports and should necessarily be modified to suit the particular location where the projects are to be set up and other circumstances that would be relevant to the undertaking. They seek to maximise the utilisation of available local raw materials, skills and technology.

The IDB would render all assistance to entrepreneurs in the setting up of these projects. Project Reports and all assistance in the setting up of projects could be obtained conveniently from any of the IDB's Regional offices at Anuradhapura, Amparai, Kalutara, Kurunegala, Colombo, Badulla, Kandy, Matara and Jaffna.

INDUSTRIAL APPLICATIONS OF PHENOLIC RESINS

The synthetic resins formed by the condensation of phenol with formaldehyde were the first resinous products to be produced commercially, known as phenolic resins. These are of two types namely :—

(*a*) Resols and
(*b*) Novolaks

Both novolaks and resols are widely used in industry and their major applications are :—

1. Moulding.
2. Bonding
3. Impregnation
4. Adhesives
5. Surface coatings
6. Misc. applications

Moulding

Phenolic resins in moulding applications are used in the manufacture of the following parts :—

1. Electrical Accessories
2. Utensils, Handles, Knobs etc.
3. Electric Controls
4. Electrical Switchgears.
5. Wiring Devices.
6. Washing Machines.
7. Telephones and intercoms.
8. Closures.
9. Machine Parts.
10. Business Machines
11. Misc. Items.

Bonding

Under bonding applications, phenolic resins are used for the manufacture of the following articles :—

(*a*) Grinding Wheels
(*b*) Brake Linings
(*c*) Steel Moulds
(*d*) Wood Waste Boards

Impregnation

Phenolic Resins are used for impregnation of wood to improve its dimentional stability, strength and electrical properties. Such impregnated woods are used in pattern making for foundry use, for jigs and tools in the engineering industry and for heavy duty applications like railway fishplates.

Adhesives

Under adhesives the following types of adhesives are made with phenolic resins :—

1. Rubber Based Adhesives
2. Lamp Capping Cements

Surface Coatings

In surface coatings, phenolic resins are used as water, acid, alkali and petrol resistant varnishes, paints and enamel media, aluminium and bronze media, rubbing varnishes and printing varnishes. In general phenolic resins are suited for chemical resistance coatings like that for food cane lacquers and for electrical insulation.

Misc. Applications

Phenolic resins in the form of minute hollow spheres are used as floating roof for crude oils to prevent their evaporation losses.

Inference

Phenolic resins as a class have most wide industrial applications and will continue to occupy its position. However, the growth rate of phenolic resins is likely to be only modest unlike other consumer plastics like polyethylene and PVC.

(*Courtesy*—Rajasthan State Industrial and Mineral Development Corporation Ltd.)

SNIPPETS

New Address

The Ministry of Rural Industrial Development has shifted to its new office premises at No. 273 Galle Road, Kollupitiya.

Secretary Ministry of Industries & Scientific Affairs

Mr. V. L. Wirasinha has assumed duties as Secretary of the Ministry of Industries & Scientific Affairs.

To Study the Chinese way

Mr. J. Kulatilake, General Manager and Mr. L. F. Yapa, Director (Planning) of the Industrial Development Board attended a Workshop at selected sites on Small and medium-scale industries in China.

This tour was sponsored by the United Nations Development project (UNDP)

To Study the Indian way

Mr. V. Kumaraswamy, Director (Industrial Estates) visited India on a Multi-Country Study mission on Industrial Estates. This tour was sponsored by the Asian Productivity Organization (APO).

The following abstracts are brief samplings of some of the articles occurring in the journals that are available in our library. These articles are provided through the Industrial Information Service (IIS) The public could visit the library and read the articles. This would not incur any cost. The Library is open between 8.30 a.m. and 4.30 p.m. on week days.

Kenaf—its production processing and potential, by A. A. Jahadhmy; *Reprint: Kenya Sisal board bulletin*

Land preparation, seed varieties, fertilisers, pests, harvesting and processing are given.

Ferrocement roofing manufactured on self help basis by J. Castro,(*Journal of Ferrocement*, Vol. 7, No. 1; July 1977), p. 17-27.

The low cost, easily built, high quality ferrocement roofings described offer an innovative solution to the serious dwelling problem affecting large numbers of people especially in the marginal urban areas and rural zones of developing countries.

INDUSTRIAL INFORMATION SERVICE

Industrial uses of coconut shell, Reprint obtained from UNIDO.

Gives destructive distillation of wood.

* * *

Alcohol production. Reprint obtained from UNIDO

Production of ethyl alcohol from wood and production of acetic acid is given.

* * *

Garbage gas plant, by Mohan Parikh and Minoo Kakalia (*Khadi Gramodyog*, Vol XXIV, No 6, March 1978, p. 310-317.

The cowdung gas plant that has acquired popularity among the villagers may recede into the background if the emergence of garbage gas plant which does not depend on cattle dung proves to be a success.

* * *

Coconut shell charcoal by Herman M. Montenegro.

Drum method and the concrete masonry kiln method is given.

Rabbit production in tropical developing countries; a review by J. E. Owen, (*Tropical Science*, Vol. 18, No. 4, 1976), p. 203-208.

Small-scale production of rabbits for meat is attracting increasing interest in many developing countries. Rabbits are capable of producing reasonable quantities of cheap meat under backyard systems employing locally available foodstuffs unsuitable for human consumption.

* * *

Back to nature for soft drink flavours (*Food Manufacture*, April 1978), p. 41-43.

Changing pace and increasing restrictive legislation present new challenges to the supply houses in the buoyant soft drinks market. Author looks at how they are facing up to these problems and finds that the accent is on natural flavours with international appeal.

* * *

Canning and bottling as methods of food preservation in developing countries, by Dr. J. T. Worgan, (*Appropriate Technology*, Vol. 4, No. 3 : Nov. 1977), p. 15-16

For the purpose of canning and bottling, foods are divided into low acid foods and foods of high acidity.

* * *

Technical note on production of edible rice bran oil, India; Central Food Technological Research Institute.

Batch type stablisation of rice bran using electrical heat and steam are given.

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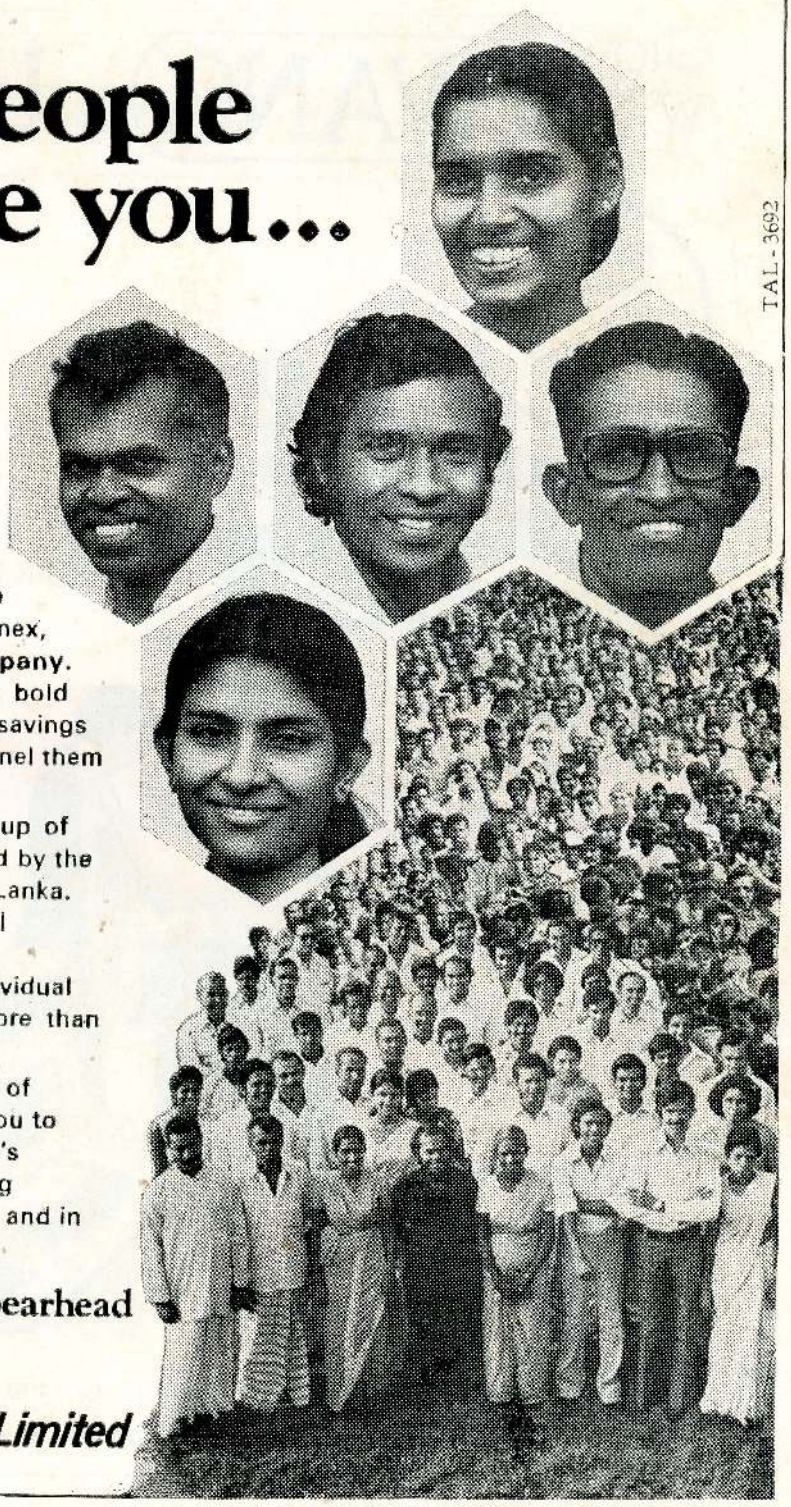

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