karmantha

MAY 1979

MONTHLY PUBLICATION OF THE I.D.B.

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1979 International Year of the Child

KARMANTHA

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Industrial Development Board of Ceylon
615, Galle Road, Katubedda, Moratuwa.

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Edited by
Philip L. Ramenaden

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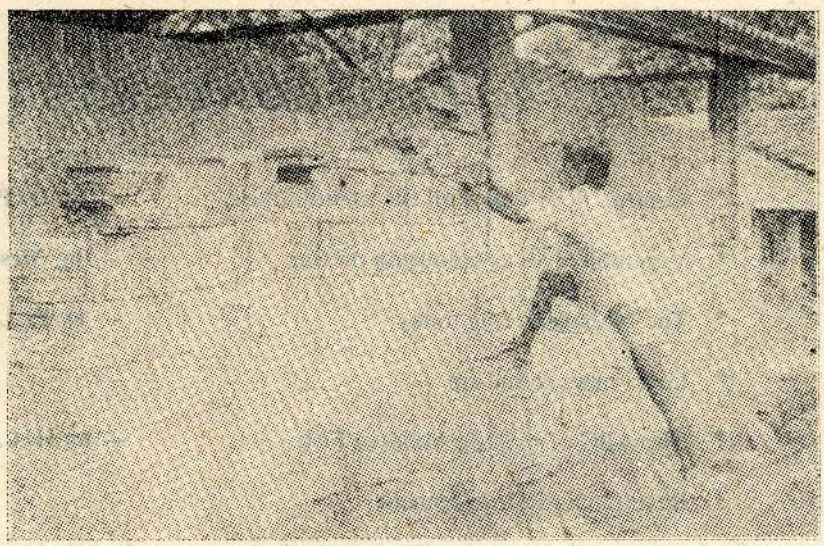
Cement floor and wall tile manufacture

By D. P. Wickramaratne

Assistant Director,
Planning Division IDB



WITH the present development programmes that are underway and the resultant flurry of building activity, there is a great demand for building materials of all types; and since today, unlike in the past, it has become fashionable to pave the floors, there is a great demand for floor and wall tiles of diverse shapes and colours.

Demand

Since we have received numerous requests for details for setting up an industry in this field, we have published here the guidelines for the establishment of a small-scale factory for the manufacture of these items.

At present, the manufacture of cement pressed floor and wall tiles is carried out by four private sector factories and one public sector factory which are all located in the Colombo District. Their total production at present is inadequate to meet current demand for tiles. Hence it would be possible to set up viable small scale industries to cater to this demand. However, it is advisable to study the market position in the selected area before embarking on the project.

Wall and floor tiles differ from one category to another depending on the raw materials utilized. Here we have discussed the manufacture of tiles utilizing cement, sand and colour pigments as raw materials. In the type of factory envisaged here, it is possible to manufacture 112,000 cement pressed tiles annually. The total investment on the project is Rs. 67,000. The return on investment is 71%.

Black, red, brown, yellow and white are the common colour pigments used to produce cement-pressed tiles of different colours. They are also made according to the consumer's design specifications, and colour requirements.

Technical Process

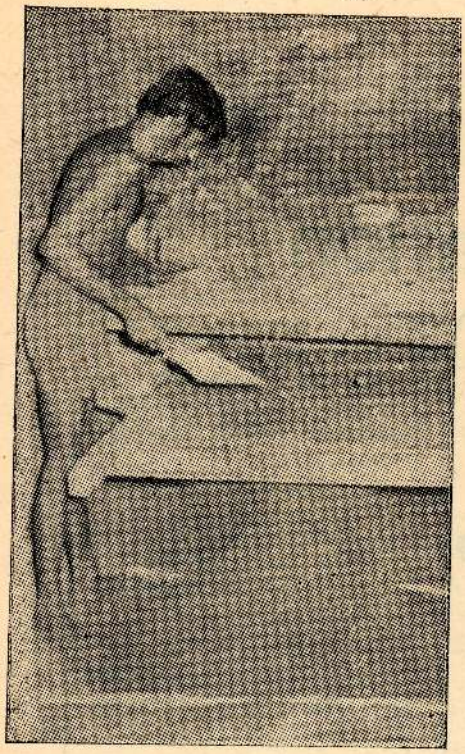
The cement pressed tile comprises two components—a top layer containing colour pigment about 1/8" thick and a bottom layer containing base mixture 5/8" thick. These two mixtures have to be prepared separately.

Preparation of the Colour Mixture

Ten pounds of pigment and two and a half cwts of cement are required for a day, to prepare the colour mixture for a factory of the capacity envisaged here.

The pigment and cement are mixed in the ratio of one part to 25 parts. The cement is weighed first and spread on a clean floor, (preferably a cemented one) and the recommended amount of pigment is sprinkled over the cement. (The quantity of pigment could be increased if darker shades of tiles are required, however this may have to be done by an experienced person or else there would have to be a certain amount of trial and error and wastage).

The raw materials i.e., the cement and pigments, have to be mixed thoroughly inorder to obtain a homogenous product, therefore the mixing operation could be done mechanically by using a manually-operated mixing machine.



The mixed product is spread on a metal lined table

The mixed product is then spread on a metal-lined wooden table and sufficient water sprinkled merely to moisten, but not to wet the mixture. Then it is seived through a 1/8 inch. mesh.

Preparation of Base Mixture

Two and a half cwts of cement and seven and half cwts (approximately 1/4 cube) fine river sand are mixed for a day's production. The mixing is done in the same way as in the preparation of the pigment mixture, though seiving is not necessary here.

Pressing

A mould which we could call the top mould is placed on the screw press and a known quantity of the pigment mixture is placed on the mould and levelled to form a layer of about 1/8 inches thickness. Then the base mixture is laid, again levelled to form a layer of about 5/8" in thickness and the bottom mould is placed over it.

Pressure is then applied by turning the screw press wheel. This operation could be handled by two unskilled workers.

Once the tile has been pressed, it is removed from the mould and laid vertically on a tray. These tiles are then allowed to stand for about 24 hours to dry. The following day, these tiles are removed from the trays and are placed in a vertical position in a water tank so that they are completely immersed, this is for curing. After three days, they are removed from the water tank and are stacked in a shed, again in a vertical position. They are allowed to remain in this position for about a day so that they would be completely dry, after which they are ready for market.

However, inorder to achieve an annual production of 112,000 tiles, (both wall and floor tiles) with work being done on 5½ days per week or 22 days per month, about 450 tiles would have to be pressed daily. Though we have made an allowance of 5% for discards breakages etc., rejections could be minimised by careful handling. Furthermore output could be doubled if another screw press is installed. This would, however entail extra investment.

Land and Building

A block of land about 20 perches in extent and a building of floor area of 40 feet × 20 feet are adequate for this project. Apart from the area set apart for the office and store-room the rest of the building could be used for production. A cement lined water tank—8 × 4 × 3 could be built outside the main building to be used for curing the pressed tiles.

Machinery and Equipment

The only machinery required for the project is a hand operated screw type press with two moulds. This machine could easily be fabricated locally. The other ancilliary requirements are:

1 wheel barrow, 2 mammoties, 2 shovels, 2 earth pans, 2 buckets, 4 trays, 1 wooden table, sieve with ⅛" mesh weighing scale and one set of extra moulds.

Raw Materials

Cement, sand and pigments are the main raw materials required for this project. The cement and pigment could be purchased from a hardware store or from the CWE or the BMC.

The raw materials required for a day's production at the factory envisaged here are:

(*a*) 10 pounds of colour pigment
(*b*) 5 cwts. of cement and
(*c*) 1/4 cube or 7½ cwts. of fine river sand.

Location

In setting up a factory of this nature, the location is the most important factor for two obvious reasons. One is the free availability of fine river sand. The other factor is the distribution of the finished product. Hence in locating the factory it is advisable to give due weightage to these factors.

Employment

It is important that an experienced manager cum supervisor be placed in charge of the project. If such a person is in charge, then, because the production process is simple, unskilled and unemployed youths could be engaged. In all, this project could give employment to about ten persons.

Investment

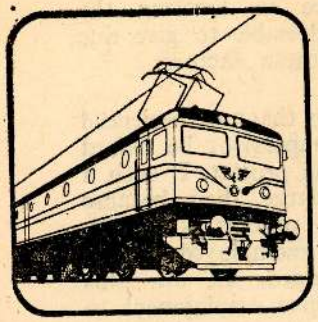
The total investment in this project amounts to Rs. 67,415/- consisting of Rs. 57,866/- as fixed capital and Rs. 9,549/- — as working capital.

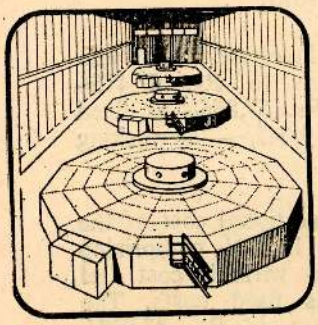
Profitability

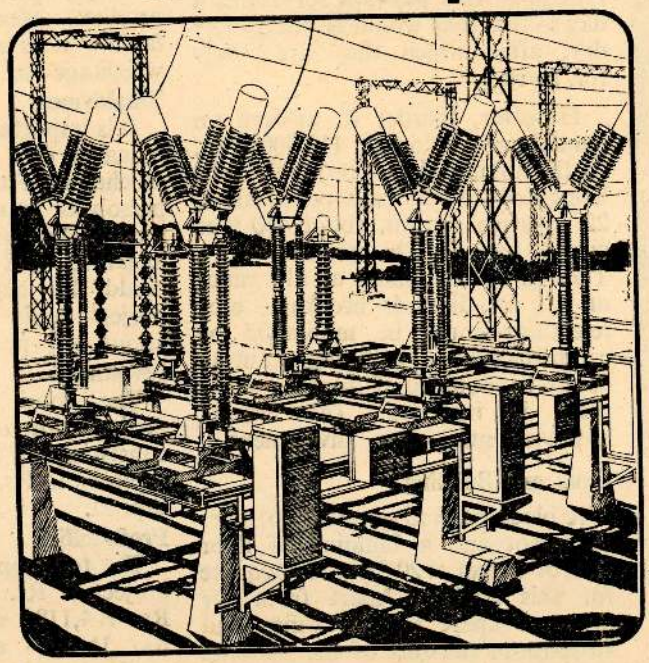
The total operational cost of the project is Rs. 119,590/- comprising Rs. 104,118/- as variable cost and Rs. 15,472/- as fixed costs. The profit before tax is Rs. 47,918/- which amounts to a return on investment of 71% with the pay back period being 1.02 years.

The tiles are placed in a water tank so that they are completely immersed

ASEA in power in industry in transportation







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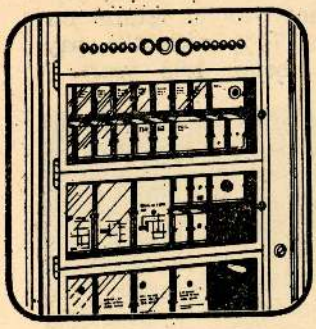
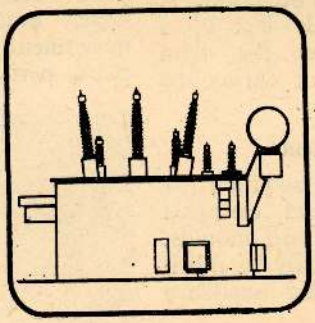
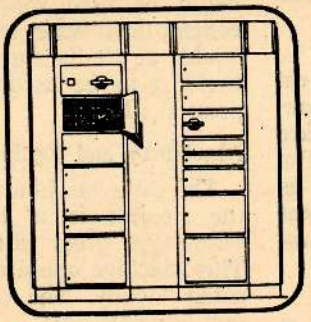
They have factories in ten countries and are represented in more than 80. In 1977 sales outside Sweden amounted to 52% of the total sales of US $2.085 million.

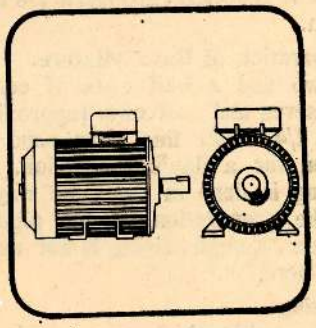
ASEA employs over 43,000 persons in its organisation.

Their programme covers the entire field of electrical engineering-from standard products to complete plants and systems for power stations, industries and transport undertakings.









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GRANT K & E 587

Vegetable dyes as colouring matter

By Mrs. G. Abeydira, *IDB*

Despite the wide use of synthetic dyes, man still prefers the age-old vegetable colouring matter for his diverse uses.

FROM time immemorial man has been using dyes and colouring matter for diverse purposes. He has obtained these dyes from various sources but colouring matter from vegetable sources has always been widely used by him.

Therefore it is but natural that even today, vegetable dyes are being used widely on a commercial basis even though synthetic products too are in vogue.

Dyes or stains originate as certain chemical substances which are secreted in the plant tissues and are extracted by processes of fermentation, boiling or chemical treatment. Colouring matter is derived from wood, bark, leaves, fruits and flowers of a large variety of plants.

Annatto Dye

This dye is commercially produced from the seeds of the Bixa. Orellana (Anatta) which is a large, quick-growing shrub or small tree native to tropical America. It is derived from the bright crimson covering of the seed.

For extracting the dye, the seeds are bruised and the pulp is mascerated with hot water in wooden vessels and soaked for several days. The seed residue is removed and the solution is allowed to ferment for a week. Alternativeiy the crushed seeds are extracted by being boiled in a sodium carbonate solution and the extract is acidified. The colouring matter could be coagulated by boiling it in a mixture of common salt.

Annatto is marketed in the form of cakes, tablets or paste. It is used to dye wool, silk and calico. It could also be used for colouring butter and other foodstuff.

Cutch or Catechu

This is obtained from the black gum resin derived from boiling chips of the heartwood. As the trees are felled, the exterior white wood is removed and the interior coloured wood is then cut into chips. The chips are then boiled until the water evaporates. It is then sun dried. Finally this decoction is spread on a mat which has been previously covered with cowdung ash. The sun drying is continued until it forms into a brittle compact solid of a dark brown or chocolate colour.

Another method of extracting this dye is by chopping newly felled trees into 2′ to 3′ lengths. The bark and sapwood could be used as fuel. The red heartwood is chopped into one inch square pieces and boiled in earthen pots for about 12 hours. The boiling process is continued until the decoction assumes the consistancy of a syrup. It is then poured into wooden frames lined with leaves and allowed to cool. It hardens into a dark brown solid mass. It is then cut into suitable sizes.

It is estimated that one ton of the heartwood would yield an average of 250 to 300 lbs of Cutch.

Cutch is in demand, in India for dyeing fishing nets, awnings, sail cloths and mail bags. It is also used for dyeing wool and silk as well.

Catechu, apart from being a dye, has also a preservative action and it is used to a large extent in printing. It is used with direct dyes but care should be taken in selecting only those resistant to the action of copper sulphate and potassium bichromate. It has been suggested that Catechu be used for Khaki dyeing. By coupling it with dizzo salts, a range of bright and attractive shades with moderate fastness could be produced. Cutch is superior to coal tar dyeing as far as fastness is concerned—it is less liable to be attacked by mildew and very "fast" to light, soap, acids and bleaching powder. It could be used for colouring pulp and paper.

A process for rot-proofing jute using Cutch and potassium bichromate has been patented.

Sappan Wood

Caesalpinia Sappan (Patangi) is a large straggling, prickly, climbing shrub, which has naturalised itself to the moist low country of Sri Lanka. Around 990 cwts of Sappan wood, valued around Rs. 95 per cwt, are exported from Sri Lanka annually.

Sappan wood yields a red dye which is used for dyeing wool, Calico etc. The source of the colouring matter in sappan wood is Brazilin (C16 H14 O5) that is soluble in water and alcohol— it forms into colourless silky needles, which when it is exposed to atmospheric oxygen, converts into Brazilein (C16 H12 O5).

The wood is cut into chips or rasped into powder and hot water is used to extract the dye. The deep orange extract is fermented to convert Brazilin to Brazilein before being used. Brazilin may be obtained either as colourless needless or as a colourless prism. It dissolves readily in water mixed with sodium carbonate giving a carmine red colour.

Sappan wood extract is used widely in Calico printing. Purple shades may be obtained by combining it with Indigo. Various cotton fabrics silk and wool can be dyed using this extract. However the shades produced are not fast.

Indigo

The Indigo plants, Indigofera species or Nilawariya require a hot moist climate and a well drained soil.

It occurs as the glycoside of Indoxyl (Indican) in the leaves of the Indigo plant and is prepared by extracting the leaves either by the wet or the dry process.

In the wet process, freshly cut plants are steeped in water in stone vats and macerated for about 12 hours or more when Indican undergoes hydrolysis (due to the action of enzymes naturally present in the leaves) and indoxyl and glucose are formed.

The liquid is drained into heating vats and the indoxyl is oxidised into indigotin by continuous mechanical beating. The indogotin settles down as a dark blue sediment. The liquid is then removed and indigo mud is washed free. It is then boiled and filtered. The resultant substance is pressed into blocks or cubes and finally dried.

In the dry process which is practised in Madras, bundles of freshly cut plants are dried and in a few weeks, the leaves change into a pale blue-green colour. The leaves are then steeped in water and fermented. Then they are macerated for about 2 hours. The green liquor is drawn into beater vats and Indigo is precipitated. The precipitate is washed, and pressed into cakes and dried in the usual manner.

Natural Indigo is manufactured by a process that has remained essentially unchanged throughout the ages. It consists of two distinct operations:

(*a*) fermentation of the plant

(*b*) Arial oxidation of the liquors

In modern times, indigo is extensively used in dyeing denims.

Kamala Dye

It is an orange red powder obtained from the glandular pubescence on the exterior of the fruits of Mallotus Philippinensis (Hampirilla) which grows throughout the tropical hills of India.

The ripe capsules are gathered in bags and shaken until the powder separates. After maturity, the fruits are stirred in water and the sediment that collects, is gathered in the form of cakes.

Earlier, this dye was extensively used in India for colouring silks and wool, but today, though it is still used for this purpose, it is largely used to colour oils, soaps, ice creams and drinks. This bright orange dye is also used to colour lemonades, lime juice and other beverages.

Manjistha from Madder

The stem of the Indian Madder (Rubia Cordifolia Madana Mohini Vel) is preferred to the root. It is bruised and boiled for about 6 hours, when the decoction turns very red. The material that is to be dyed is boiled in water to which some ash has been added inorder to make it Alkaline and then steeped in a solution of alum and water. Finally it is dipped in the dye.

Chlorophyll

Chlorophyll is found in green leaves and the stalks of plants. It is extracted either with alcohol or with dilute caustic potash and precipitated using mineral acids.

Betel leaves are a good source of this dye.

Chlorophyll extract is used for colouring soaps, oil, perfumes, confectionary liquors and toilet preparations. It forms the base for water soluble copper chlorophyll, and is widely employed in deodorant tablets, breath candies, mouth washes tooth pastes, chewing gums, face creams and ointments.

Yellow Dye

The heart wood or its saw dust, and the roots of the Artocarpus integrifolia yield a yellow dye employed to colour monks' robes. It is fixed with alum and intensified with turmeric.

The chips of wood are soaked overnight in rain water or soft water. Then they are boiled for about 30 minutes using a moderate heat. The liquid is then filtered. The article that is to be dyed is placed in the liquid and boiled again and allowed to simmer on low heat for about an hour or so. The dye bath is allowed to cool. Once it cools, the article is taken out and soaked in clean water. It is then hung out to dry in the shade.

The Manager's Role Today

A Point of View

By

P. L. Ramenaden

THE corporate sector in the modern world is not merely a profit making organisation—it has a multi-purpose function of providing employment and social security to its employees, undertaking research and development, and the expansion of communications and transport etc.

As can be seen from this, the role of management today has changed completely from the past.

The role of the present-day manager is summed up in the following statement:

As you strive to become a better manager, emphasize people—results in your thinking and working. You may lay out a perfect assembly line, develop wonderful materials and figure out the greatest mathematical formula, but if, people fail to respond favourably to your direction you're not a successful manager—*Lyn. W. Whiteside*—Effective Management Techniques.

In the past

In the past, however everyone was of the opinion that the dominant theme of management was profit. Most were sceptical that management had an essential role to play in society. Even as late as the 1950s, there was near universal consensus that the goal of management was to maximise profits and by so doing, the maximum benefit would accrue to society.

However in the last decade or so, there was a gradual shift of focus and emphasis away from this simplistic-profit-formula. Thus today, there is a growing awareness that the welfare of employees and consumers is another goal of management, if only to maintain a harmonious atmosphere for maximising profits.

Therefore, with the growth of business enterprises and industrial ventures, from the level of the local market to national and international levels in the modern world, there has been a subtle but definite change in the accepted goals and motives of managers.

Basic needs

Unlike in the past, when at the level of the local market, the man who could produce efficiently could trade with others to meet his basic needs etc and earn a profit as well, today, commerce has changed a great deal—the size and production of industrial units have increased and with it the power to accumulate vast capital. Hand in hand with this expansion of commerce, not only a wider market but also a new social role for business, has emerged. Today more and more sectors of the population have come into contact and have been drawn into the commercial system until the whole country has been linked together bringing a social and economic awakening in the working classes.

As a result of this awakening, the organisation of labour into unions has come about and with it, the introduction of higher concepts of human welfare such as minimum wages, limit on working hours etc. Thus gradually, the autocratic kings of profit and capital have been made to share power with Labour Ministers and human welfare.

Therefore since social life has changed to such an extent, the functioning of large enterprises are no longer dependent solely on their wealth and efficiency and companies that prosper today cannot claim their success all on their own. Profit, merely for the sake of profit, is no longer the goal.

Multi-purpose

Today's companies serve a multi-purpose social function of providing for employment and income to the population; providing education and training and providing revenue for the government. Thus, today, business is the most well organised civilising intermediary between Government and society. Companies try to fulfil this function through the profit motive. They must, however, become aware of their wider mission and work it through the motive of service.

If management follows this course, the present problems of corporate management will lend themselves to easy solution. However as companies grow in size, they become impersonal. No longer is the individual entrepreneur, the leader. The complicity of processes of production are too intricate for management by an individual.

The old pyramid of production tapered into an individual at the top. Today it tapers into an impersonal system. Management, employees, and consumers have all become more or less equal partners in a social organisation intended to serve the welfare of all.

Social Service

All acts motivated by profit contain an element of Social Service. For the country to grow economically, the only available social force or lever is the lure of profit. There is no effective force of idealism that is capable of achieving it. It is only by recognising this relationship, that a country can accomplish its task of development.

Parallel to the expansion of trade to global levels and the rising succession of motives from profit to welfare and well-being, there is another allied movement relating to the quality of products manufactured.

In the first period there was a shift from trade in raw materials to processing of raw materials into finished products of utility. This shift has continued towards the upgrading of these products into more sophisticated forms, durability, precision, beauty, aesthetic value, fashion and personal enjoyment.

Changes

These changes coupled with the expansion of markets have brought with it a change in the problems facing management and the personal qualities required to be an effective manager. More than ever before, today's manager must act in situations with a multitude of unpredictable variables. Planning, analysis, and projection, the traditional managerial decision-making tools are helpless in the face of rapid fluctuations in exchange rates, national calamities effecting transport at the other end of the world, political instability in far off countries, changes in governments, their policies and the entrance of new competitors, into traditional markets etc. Factors such as these, contribute to a highly tenuous and to a large extent unpredictable market. Thus innovations and fresh approaches are frequently required to meet contingencies in inter-nation trade.

The able manager must not be completely at the mercy of the unknown. He must possess some capacity to assess and know how to act. Normal thought processes alone will not suffice. He must possess some intuitive perception of the market and express his perception in fresh innovative policies. James L. Hayes, President of American Management Association stated it thus: "Few managers have the gift of vision".

Solution

The solution to every problem in life lies within or around the problem itself, not somewhere far off because the problem and solution are of the same consciousness. This vision or perception penetrates to the heart of the situation beneath the surface appearances and discovers an opportunity or a solution in every present situation. All life is capable of growth and this perception spies out the live end of growth in any circumstance and sees how it can feed from present entanglements. Such perception can only be developed by rising above the present fixity and limitation of pre-conceived ideas, preferences and past habits of thoughts.

A manager with such a perception has an intuitive grasp of his company's mission and how to foster it. He doesn't make the error of taking whatever is produced and trying to find someone who will buy it, year after year making the same thing in the same way.

An awareness

The perceptive manager has an awareness of the needs and potentials of his market and the capacities of his organisation. His vision reveals how the two can best be harmonised.

The greatest perception that a manager can have is a perception of the evolving social context in which they operate. In the case of developing countries, it is that of national development, while in developed, industrial Western nations, it is that of human welfare and well-being.

In Sri Lanka, for example, today, with the liberalised policies, the manager has to think in quite a different manner than in the recent past. Today while heading a complex industrial unit, which he has to see is viably run, he has to think in terms of the new competition faced by his firm.

Apart from this, with the present emphasis on development that is being stressed by the Government, and also because of the major role that the private sector has been called upon to play, the manager has to ensure that the products manufactured by his firm are not only of good quality but also that the cost of production is not too high while at the same time, that his firm is not out of focus with the present trends of policy and production.

Only managers who have this ability will be the successful ones in the next decade because they will be able to make the right decisions on which products to manufacture and which markets to tap. They will also be able to align themselves with the evolutionary direction of their society.

Not enough

Today it is not enough for an entrepreneur to have energy, dynamism and education and even technical know-how. He must develop an integrated social personality which would reflect that commerce has become far more integrated with the social life of the society and no longer compartmentalised. Thus the new entrepreneurs would have to be educated youth who are drawn from the establishment and culture of society but who have discarded the established ideas and conventional thought of the old society and commerce.

Thus it is evident that managers are now responsible not only for profit but also for social results, meaning the adjustments and satisfaction of their employees. However, finally, their success will depend on how far they can motivate people by making work a source of interest for the employees.

Local News roundup

POWER ALCOHOL FROM MANIOC

By T. T. Jayaweera

The Minister of Industries and Scientific Affairs, Mr. Cyril Mathew is expected to seek the assistance of the Overseas Development Service of Britain for the study to extract power alcohol from manioc.

It is understood that Britain was prepared to help Sri Lanka in this project if assistance was sought officially by the Sri Lanka Government. The Minister who sought Government approval to negotiate with the **ODS**, was granted approval after the matter was discussed at a cabinet meeting.

A committee of research scientists and officials from several government Institutions and Corporations has already been appointed to draw up a programme to study the feasibility of producing power alcohol or alternative sources of energy in commercial qualities to replace petrol as motive power.

The **IDB** research team has already begun work on a project to extract alcohol from sugar cane.

Meanwhile the cabinet has already approved Local Government and Prime Minister Mr. R. Premadasa's proposal to establish a study group to submit a comprehensive feasibility report on the conversion of replenishable organic energy.

The Committee comprises representatives of the Ministries of Local Government, Housing and Construction, Industries and Scientific Affairs, Finance & Planning, Transport, Power & Highways and Lands & Land Development.

RUBBER COMPOUNDS AVAILABLE

Small-scale rubber goods manufacturers can now obtain their requirements of black and coloured dry rubber compounds, compounded and centrifuged latex from the IDB's Central Rubber Compounding Unit at the Boards' head office.

Dry rubber compounds and latex formulated to suit different products, are available at reasonable prices. The IDB has set up this unit inorder to assist small scale industrialists to produce quality rubber products which could compete with high class imported items

Inquiries in this connection should be addressed to the Deputy Director, Rubber and Leather Group of the Extension Services Division, Industrial Development Board, at 615, Galle Road, Katubedde, Moratuwa.

Ipil Ipil: new source of fuel

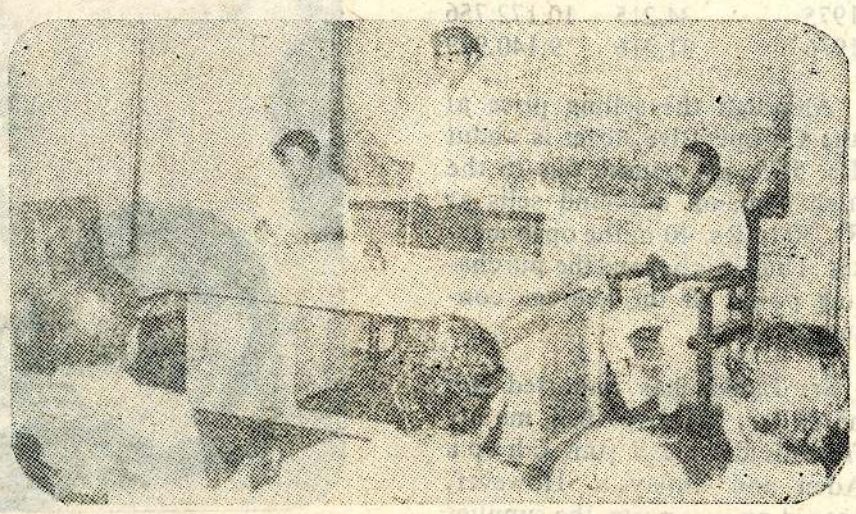
In an attempt to conserve our fast dwindling resources of wood, the Water Resources Board has launched a programme to propagate a fast growing tree—Ipil Ipil—which could be ideally used as firewood.

Seed material and details of cultivation could be obtained from the Water Resources Board, 2A, Gregory's Avenue, Colombo 7.

The ABC of Making Maldive Fish

By H. C. S. Peiris and S. H. Kodagoda, IDB

It originally came from the Maldives but today it is more Sri Lankan than anything you can think of—no Lankan trencherman worth his salt, looks down in disdain at this tasty morsel that makes the 'pol sambol', 'Lunumiris', and the 'Seeni Sambol' what they are. Of course we are talking of the Maldive fish or to call it by its popular local name, Umbalakada—which has become a luxury to most of us.



Recently the Industrial Development Board laid bare the secrets of its manufacture when at a well-attended lecture, addressed by an adept of the art, the public was taught the secret manufacturing process of the Maldivians.

Maldive fish is a cured fish product made by subjecting certain species of fish to several processes such as boiling, salting, smoking and drying. The quality of the finished product is judged by the organoeptic properties such as appearance, taste, flavour, texture and colour etc.

Demand

At present there is a heavy demand for Maldive fish throughout the year though, during festivities there is a sharp rise in demand. This demand is met entirely with imports. According to the C.W.E. which imports the bulk of it, around 4,000 cwts are needed monthly for distribution on the ration card at 1/2 oz. per person.

Top: The Director of the Extension Services addressing participants at the seminar.

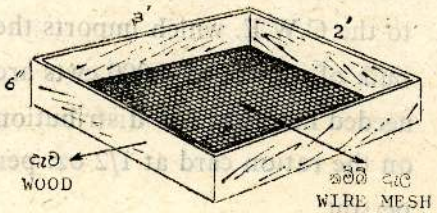
Left: a section of the participants.

The import of Maldive fish during the period 1971 to 1976 is as follows:

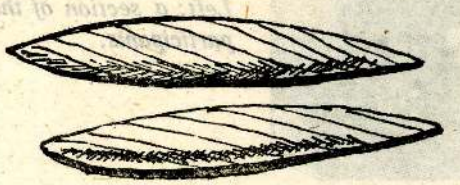
Year	*Quantity/cwt*	*Value*
1971	100,807	18,698,339
1972	78,334	20,693,602
1973	48,399	12,829,092
1974	66,696	19,033,680
1975	34,215	10,172,756
1976	31,216	9,140,999

Although the selling price at the Co-operative stores is about Rs. 5.75, per pound, due to the high demand, a pound sells at Rs. 30 to Rs. 40 in the open market. Thus it is beyond the purchasing power of the average consumer.

Sri Lanka has imported her needs of 'Maldive' fish mainly from Maldives, Pakistan, Ethiopia Aden and Malaysia However, accord ng to reports. the supplies are irregular and unpredictable because these countries find it more lucrative to export fish n 'wet form' than as 'Maldive' fish.



According to the Ministry of Industries, Sri Lanka had exported a small quantity of this product in 1975 but an enterprising investor would be able to carry on a lucrative business in this product either locally or abroad.

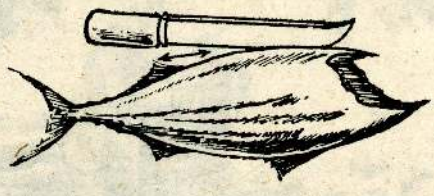


Seminar on Maldive fish in progress at the IDB

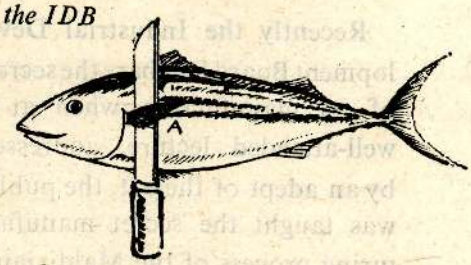
Since the imported variety is freely available and also because the species of fish utilized to manufacture this product are not available the year round, not many units have taken to manufacturing Maldive fish. This industry, however, at present is being carried on at a cottage industry level on the coastal areas.

Process Technology

There are various methods in vogue for the manufacture of Maldive fish. In this article we have given a process that is hygenic and gives a satisfactory product.



The fish of the blood group species of fish and the tuna are the main raw material. A good quality product could be made from fish of the tuna group. The chief varieties of fish used are Balaya, Atawalla,



Cantor and Kelawalla. It is best to use fresh fish if good results are to the expected.

Cleaning of fish

Wash the fish well in Sea water and in clean water to remove all extraneous matter and surface wastes. Remove the head portion with a sharp knife.

Boiling

To boil 100 lbs of fish, use 10 gallons of salt water containing one to two measures of salt or 5 lbs of salt. The fish should be completely immersed in the water. The fish should be boiled for about 45 minutes, remove the fish from the water and allow to cool. When it has cooled completely, hold the fish vertically and make a sharp cut along the Ventral line and towards the mid

(*Continued on page 25*)

RESEARCH AND DEVELOPMENT

RICE HUSK IN PLACE OF CEMENT?

The findings of two research teams on possible economies in cement consumption by mixing it with fly ash and rice husk ash were discussed at the recent research session of the Central Board of Power and Irrigation held in Dharwar (Karnataka), India.

A research team of the Uttar Pradesh Irrigation Research Institute (UPIRI) Roorkee, has estimated that savings in cement ranging from 33 to 67 per cent can be achieved by replacing a certain quantity of it with fly ash with no impairment of strength.

It has been found that the strength of non-fly ash mix obtained after 23 days can be achieved in 90 days by replacing 33 per cent of the cement with fly ash by volume, in 180 days by replacing 50 per cent of cement and in 360 days by replacing 67 per cent of cement. Thus, in river valley projects, savings in cement upto 67 per cent by volume can be achieved.

Comparing strength at equal stages for non-fly ash lean concrete mixes of 1:4:8, 1:5:10 and 1:6:12 with fly ash concrete mixes, savings in cement consumption of the order of 22.6, 29.4 and 39.2 per cent respectively is achieved.

The Maharashtra Engineering Research Institute (MERI) Nasik, has thrown up the possibility of using rice husk ash as a hydraulic binder in combination with lime or as a pozzolana for part replacement of cement in mortar and concrete. It is stated that finely pulverised ash obtained by burning the rice husk at optimum temperatures satisfies the requirements for a pozzolana as specified by the Indian Standard is 3812-1968.

In another study conducted to assess the optimum combination of lime and rice husk ash and to estimate the mortar strength that can be achieved for various proportions, by using air burnt rice husk ash and natural sand, it has been found that the mortar using 70:30 (ash:lime) combination of 1:3 strength is acceptable for building masonary mortar, plaster, foundation concrete etc. as per IS: 4098 (specification for lime-pozzolana mixture). The study has also indicated that air burnt rice husk ash upto 10 per cent can also be used as part replacement of cement without significant reduction in strength.

The use of rice husk ash, a waste product the team says, is feasible either to produce an alternative binder in combination with lime or as part replacement of cement mortar upto a maximum of 10 per cent. This may be economical in certain situations, particularly in lime producing areas besides conserving scarce cement, they say.

The study has also made the following points. The rice husk ash contains more than 90 per cent of reactive silica; Calcined at optimum temperature and in a finely divides state (-90 mic) it satisfies the requirements of lime reactivity and cement reactivity as per IS: 1727 The ash can be used as a hydraulic binder with lime. The compressive strength of this binder is adequate for general building masonry work. The optimum combination of ash to lime appears to be 70:30 to 60:40 by weight; hydraulic cement can be made by inter-grinding the mix of ash with hycash with hydrated lime in pug mill. This cement develops adequate compressive strength which satisfies the requirements of LP-40 and LP-20 as per IS: 4098 of 9171. The lime rice husk ash demands more water for the same consistency. Normal consistency of portland rice husk ash cement is more than that of ordinary portland cement. The former needs less setting time and its soundness is found to be within limits.

Cement replacement by rice husk ash shows reduction in strength (decreasing trend of compression strength) with respect to control. But a 10 per cent replacement does not show much reduction in strength. The percentage reduction in strength is found to be less in lean mortar than in rich mortar.—(*Courtesy of the Hindu*).

WOOD GAS VEHICLES

The Volvo and Saab-scania automobile manufacturing companies in collaboration with Swedish government are to produce devices to convert conventionally powered vehicles to wood-gas. Wood gas generators have been produced to work with cars, trucks, buses and tractors. Further, Swedish government has already passed safety regulations for the operation of wood gas vehicles.

ALTERNATIVE ENERGY

The US along with Belgium, Canada, Ireland and Sweden signed an agreement with the International Energy Agency which calls for co-operation in using forest biomass.

All the parties have agreed to share findings, to co-ordinate national biomass programmes. (Courtesy Tata Energy Research Institute)

Industrial Developmer

by L. F. Yapa,
Director, Planning Division, IDB.

Representatives of 16 countries in the ESCAP region visited China towards the fag-end of last year to study small and medium scale industries in that country. The writer of this article, Mr. L. F. Yapa, Director, Planning Division of the IDB was a member of this delegation which made a thorough study of the industries of the Kiangsu Province, visiting over 21 factories and having discussions with the Chinese officials at all levels—administration, management and production.

We in Sri Lanka can learn much from China which is a basic needs oriented society where every citizen is adequately provided with the basic needs of food, clothing and shelter. It is only when we view China's achievements and failures in the perspective of the poverty and confusion which prevailed before 1949 that we realise that some of the more successful development methods adopted by China merit study with a view to adoption. We cannot, of course, copy the Chinese methods look, stock and barrel so to speak, but there are many lessons that we could learn from them.

The concept of industry and the role of small and medium scale industry are clearly laid down in China. The demarcation of large-scale, medium and small industries is on the basis of out put. For instance, in the iron and steel industry, factories with an output of over 1 million tons per year are considered large scale, while those with an annual output of 100,000 to 1 million tons are considered medium scale and those with an output less than 100,000 are considered small. However it must be mentioned here that what is considered 'small' in China is not 'small' in the Sri Lanka context. We did not see any cottage-type of industries and we are not aware whether such industries still exist in China.

The basic concepts underlying industry in China are:

(*a*) Industry should be integrated with agriculture, since the latter sector is deemed to be the back-bone of the economy. This means that industry should produce all inputs required by agriculture such as diesel engines, tractors, implements, fertilisers, weedicides, insecticides etc. It also means that industries should process agricultural outputs.

(*b*) Factory workers, Technicians and Managers should rely on themselves for technical innovation to increase productivity. One of the slogans given wide publicity with regard to technical innovation is **"let the old bring forth the new"** accordingly the old factories taken over during the time of the liberation in 1949, have been renovated and used. Another principle is that of **"egg laying".** This means that old factories have been used to spawn other factories using their backward and forward linkages. For instance, at Wushi city, an old textile factory has given rise to eight new ones, while production at the old factory itself has risen 70 times since liberation. Merging small factories, referred to as "Ants growing into elephants" is another way.

(*c*) There should be co-operation between rural and urban industries, in order to raise quality, productivity and to bridge the gap between the urban and the rural sectors, between workers and peasants, and between manual and mental work. This is the concept of the dragon—the dragon's tail should be in the rural sector while the head should be in towns and cities. Forms of cooperation include sub-contracting among factories run by the Communes, Production Brigades and Production teams. The final assembly is undertaken in the factories located in towns and cities. The use of wastes from city industries by the rural industries is another form of co-operation.

(*d*) Small and large scale industries should exist side by side. This is referred to as **"Walking on two legs"**—the large scale industries provide the basic needs of the people while the small and medium ones create non-agricultural employment, help to use local resources and supply the large—scale industries with components. Thus the large and small industries sustain each other.

In the Kiangsu Province, industries contribute 74% of the total value of production. Of this, the value of output of small and medium scale industries is as high as 88%. Although there was no possibility of checking these figures, it was however apparent that in China small and medium scale industries play an important role

nt the Chinese way

in generating employment, industrial production and the use of local resources.

Institutional Pyramid

In respect of industries, at the top of the institutional pyramid is the State Council, headed by the Prime Minister. The Planning commission which is one of the Agencies of the State Council, is responsible for planning the economy. While the Local Governments of the Provinces, Prefectures, Counties, Cities and the Communes have their own planning bodies, both the Central and local Governments have Bureau dealing with various types of industries. These are the agencies of Government in charge of industries.

Apart from these, there are production oriented institutions such as Production Brigades, Production teams etc. under communes and the factories.

The last but not the least element of the institutional framework is the Communist Party which is present in some form or other right down to the Production Teams which are the equivalent of villages.

Macro Plan

A Macro Plan for the entire country is drawn up by the Central Planning Commission every five years and proposals to fit into this Macro plan are called for from the local Governments and factories. Then the various Bureaux of industry select and translate these proposals into projects. The viability of these projects are gauged on the needs as well as their profitability though the latter is not the main criterion of viability. For instance in one of the factories visited, P.V.C. was being manufactured from limestone because that material was available in the area and had to be utilized to generate employment. This process would have been considered too costly in a Western country.

Again perhaps because the Chinese considered the technical training of rural workers as being more important than maximum capacity utilization of machinery, we found a vast amount of under-utilised machinery in rural areas where workers returned to the fields during peak ploughing and harvesting seasons. From the Bureaux, the projects are sent to the Provincial Planning Commissions where they are balanced to some extent with demand and supply, available resources, skills, technologies capacities etc. and then sent on to the Central Planning Commission where they are subject to a final balancing process.

Approved

The Projects are deemed to have been approved once they are incorporated into the National Plan, wherein the target and quotas to be met by the Provinces, Prefectures, cities, counties, and communes are clearly stated. In setting the targets and quotas, room is left for over fulfilment or under fulfilment of the targets.

Besides the Five year plans, one year plans within the framework of the 5-year plan are also prepared by the Planning Commission. These annual plans are translated into quarterly or monthly plans and programmes by the production brigades, production teams and the factories.

Funds in the form of equipment, (in the case of state owned industries,) for approved projects, may come from either the Central Government or the local Governments. However, in most cases the factories themselves fabricate most of the required equipment, using their own reserve funds obtained from over fulfilment of quotas.

Close Watch

A close watch, however, is maintained by the Planning Commissions on the implementation of projects and the Production Brigades, Production teams and the factories have to send progress reports high-lighting the problem areas so that the Planning Commissions could take appropriate action with the backing of the relevant Bureaux of Industry, to solve these problems and to ensure that targets are reached.

Ultimately however, it seems as if it is the Communist Party which takes action to motivate workers, technicians and managers to implement policies and plans.

Technology Generation

Industrial development in China at the time of the liberation, had been concentrated in Shanghai and most factories at that time were producing light consumer goods such as textiles. Therefore there was an urgent need to build up and develop large and small indigenous industries. Inorder to do this, best use had to be made of existing factories to set up production and to set up new factories as well.

However technologies were not freely available to set up industries on the basis of the new policy. Therefore China turned to Russia and about 156 projects were set up under this arrangement. However after connections were severed with Russia, China had to depend on her own resources and skills to develop her industries.

Inorder to do this, the Central Government, as well as the provincial, prefecture, county and city governments and even some of the large factories have set up research facilities. Technological problems of the various factories are listed and sent on to the research institutions. The research institutions then prepare their programmes according to these priority lists and the findings are transferred to the factories which have requested for assistance and to others who need it. Since in China research findings are considered the property of the people, the question of patents and royalties does not arise.

Apart from this, there are annual science conferences organised by the Academy of Sciences and seminars and workshops to which participants are sent by factories. In addition to

these, there is also an all China Association of Science and Technology. These forums enable the exchange of technical and scientific information, while at the same time there is a continuous flow and exchange of views, opinions and information. For instance we noticed on one of our visits an article on a scientific subject complete with illustrations and explanatory notes displayed on a factory notice board for the benefit of the rank and file of the factory. Furthermore, the practice of "sending out" workers for training and "inviting out of" experts and even of consumers of industrial products to give their comments and observations is being followed. Recently even students are sent abroad for training and foreign experts too have been invited into China.

Super power

Apart from this, more and more technical co-operation agreements are being entered into with developed countries not only for training purposes but also for the importation of necessary technologies. It is the aim of the present leadership to make China a super-power by 2000 A.D.

So far, however, China had relied mainly on her own resources for technical innovation and development. At all factories that were visited, the managers proudly announced that most of the equipment and processes used in their factories had been developed by themselves in their own factories. To do this, they use a system referred to as the "Three-in-one combination" where a committee comprising representatives of workers, technicians and management cadres undertake these innovations and if it is needed, they call in the help of scientific institutions and other factories. The models developed or the new processes perfected are tried out, tested and installed. Wide publicity is given to these achievements and the personnel involved are praised and adequately rewarded.

All factories are advised to emulate the example of the Taching oil field, the personnel of which successfully prospected for oil and developed their own equipment although foreign consultants had reported that China did not have oil deposits.

Management

In China there are two types of ownership—the State and Collective owned units. The State factories are set up by the Central Government and local governments such as those of the provinces etc. The profits of these factories have to be turned over to the State. The factories owned by the Collectives, belong to groups of individuals; Collectives pay 45% of the profits as taxes to the government.

All state owned factories are managed by Bureaux of industry and are mainly responsible for administrative matters, staffing and generally for enforcing Government policy. Management at the factory level is by a manager under the guidance of a Communist Party Committee. Therefore it becomes evident that the ultimate responsibility for management of industrial establishments lies with the PARTY.

There are Trade Unions in China, but unlike those in either Britain or Sri Lanka, they are not so powerful, and their main function is making representations regarding the welfare of workers.

Wages

There are eight wage scales for workers. Apprentices get a minimum of 20 Yuan a month (1 US$ - 1.70 Yuan) the highest wage of 100 Yuan a month is paid to skilled workers. The remuneration for management is on a different scale with the minimum being 30 Yuan per month and the maximum 140 Yuan a month. However veteran workers may get higher wages than the General Manager of a factory. In addition, a bonus is paid if targets are fulfilled and the enterprises are run at a profit; factories are also allowed to use a small percentage of their earnings on welfare measures such as housing meals, medical attention etc.

Manpower

Manpower development is directly related to the skills required by the factories and is undertaken by the Universities, Technical Colleges and other technical institutions. There is much emphasis on practical training and students do practical work in factories so that when they leave school, they are already familiar with their future jobs. Though there appeared to be a shortage of engineers at most factories, the technicians assisted by the workers appeared to be in control.

Intriqued

We were intrigued with the system of motivation of workers in a society devoid of capitalistic type of stimuli, and we were told that workers are not dismissed for misconduct, negligence or inefficiency, instead, after being warned in the first instance, they are publicly criticised if they persisted to be negligent or inefficient If, even then, they did not improve, they are rehabilitated. We were not quite sure what was meant by rehabilitation. It is this delibrate and planned method of punishment and reward along with strict discipline which has produced such spectacular results in China.

Pricing

Prices are fixed by the Government on the basis of needs, and are not the result of marketing forces as in free or in mixed economies. Basic needs are available free or at a nominal price, though prices of commodities such as sugar, rice, meat and manufactured products such as bicycles cost more in China than in Sri Lanka. However house rent is very nominal. While the Central Government fixes the prices of essentials such as cereals, iron, steel and fuel, the local governments fix the prices of non-essentials. Although prices are not the product of market forces, demand and supply are taken into consideration as are production costs in fixing prices.

The profit margins of the factories are kept within 5% to 15% and are never allowed to exceed 20%. In fact, the Chinese officials claimed that prices had seldom risen over the last 5-years but had on the other hand, come down as a result of a reduction in production costs and increase in productivity. However the prices of essential goods are delibrately kept down whatever the production costs. The losses incurred by the factories as a result of this, are made good by the State.

Marketing

Industries in China are not faced with the type of marketing problems known in the free market economies. The production quotas are fixed and the entire production is absorbed by Corporations set up for local distribution or for export. Thus the factories are not burdened with having to look for markets. However this does not mean that consumer preferences are not heeded although advertising as we know it, is unknown. But on the whole, the consumers have no choice as in a free economy and even the quality of certain types of goods is poor. But efforts are being made to deal with these problems.

Raw materials

The procurement of raw material is no problem as the Planning Commissions fix quotas taking into consideration the requirements of the factories. Apart from this, as in the case of marketing the large scale industries sustain the smaller ones and vice versa in, what is known as the "concept of the Dragon". The tractor and the diesel engine factories we visited constitute the head, while the component factories from the tail.

(To be Continued in next Edition)

ENERGY FROM RUBBISH

With Britain's streets littered with rubbish caused by the dustmen's strike, UK's Waste Management Advisory Council has come up with an answer as to what to do with it. It has come up with two schemes to use the waste as fuel.

The millions of tonnes of municipal waste, it says, could be used as fuel and between 2 to 3 million tonnes of coal, worth £ 40 million to £ 60 million (1976 prices) could be saved by burning wastes from households, shops and offices.

The two schemes have been drawn up so that suitably, treated wastes could be used to fire solid fuel boilers and cement kilns. Since raw, untreated waste is not suitable for fuel, the schemes depend on first shredding the waste and then extracting ferrous materials, feeding the rest of the rubbish directly into the boilersor kilns(New Scientist)

FTZs: Benefits and disadvantages

By Ariya Abeysingha

The following is a reproduction of excerpts from an article published in Industrial Ceylon Vol. 18 No. 1 which is being published in response to numerous requests we have received from students asking for information regarding the Free Trade Zone.

A point of view

The question is often posed for whose benefit do the Free Trade Zones operate ? The FTZ as a zone for "Low-cost-production—base" to invest, to take advantage of relatively low cost labour, low land costs, low rentals, ineffective and/or indifferent anti-pollution measures are the benefits to multi-nationals. The countries establishing FTZ's received the benefits of enlarged employment, export expansion as benefits, whilst in the name of development they also could import pollution or its effects through foreign investments.

The experience of FTZs revealed that the "spill-over" in techno-management fields could hardly be expected from multi-national investments. There are some economists who argue that the FTZ's have made profound contributions to a country than bringing in light industries before launching on heavy industry investment involving large capital investments, long gestation and pay-back periods and lower investment returns. Thus, it is argued the bringing in of light industries to the FTZ is the initial stage for creating the proper industrial superstructure and background. This is refuted by critics who say the base industries are the background and backbone for proper planned economic development. They give clear illustrations from Singapore, S. Korea, and Taiwan where "sweat industries" have mushroomed in the FTZs in the name of light industries.

There are proponents who also argue, citing Taiwan and South Korean cases, that foreign investors are seeking FTZS with favourable investment climate with adequate infra structure and inexpensive labour cost located closely to the target market regions. The total investments in three EPZs in Taiwan in 1974 was U.S. $ 159 million of which 90% were foreign investments, investment of overseas Chinese investors, and joint ventures.

There are critics who argue that these are capital shifted in the name of "investments" to avoid taxes in the home country e.g. British capital investments in tourism in Seychelles, Yen capital investment in Taiwan, Philippines, Indonesia, Hong Kong, Thailand, Singapore, Malaysia. French capital investments in Ivory Coast and Mauritius, U.S. dollar investments in the Taiwan, S. Korea and Philippines. Yet there are others who argue that the minor role played by local FTZ participants indicate the need to attract foreign investors to bring prosperity to the host country and also to help the developing of the related industries in the domestic customs territory. They go on to point out that foreign investment in the FTZ would have a demonstration effect to induce local entrepreneurs to take to investment in industry.

Another school of thought points out that the FTZs encourages labour intensive industries and productive use of labour citing the case of Taiwan where in 1973, 200 industrial plants located in 3 FTZs of 200 hectares in total generated employment to 60,000 people. Thus, they argue that the FTZ would certainly solve the unemployment problem and make greater contribution to the national economy. Critics of this school of thought argue that FTZ type of employment is "exploitative" sweat shop industries citing Singapore, Hong Kong, Taiwan and South Korea and argue this type of industries conducive to areas of "Yellow aristocracy" is not suited to countries like Sri Lanka and depends on the type of industry decided.

Another argument in favour of FTZs is that they will in addition to promoting export trade and thereby increasing foreign exchange earnings, also leads to high utilization value of land through mass production of industrial products which is not possible through agricultural development.

The impact of EPZ on domestic industries in the host countries and the adverse effect on domestic exporters is another fear expressed often about FTZs arising from

(*a*) FTZ industries producing the same products like the domestic manufacturers,

(*b*) Supply problem exists for items manufactured within the FTZ do not go to domestic firms;

(*c*) Domestically produced items are not competitive enough to be used by the FTZ manufacturers,

(*d*) Mutual co-ordination of the use of idle facilities between the domestic and the FTZ manufacturers,

(*e*) Leakage of products or shipping of certain percentage of products from FTZ to the domestic market.

Critics argue that more cautious selection policy of potential investments to the FTZ could avoid these problems. The local supply of FTZ goods in a limited way they argue would keep prices in check, alleviate short supply situation, make domestic industries competitive and thereby economies of scale would be restored to improve quality and design and make them face the acid test of free competition.

INCENTIVES FOR INVENTORS

The ingenuity of the Chinese people has endowed the world with some of its most valued innovations in the past three thousand years.

"Though China is a society devoid of capitalistic style of stimuli, even she has deviated from accepted policy to provide cash lures for useful devices!"

Paper and gunpowder are well known as Chinese discoveries. There is ample evidence too in Chinese cuisine of what can be achieved by dogged experiment and inspired creativity: what other nation would make such delectable use of bears' paws, fish stomachs and parasitic fungi?

Crossbow

The Chinese invented the crossbow in the third century BC. Two hundred years later in search of more refined forms of combat, they found football.

In the second century AD, they came up with the first seismograph and in the third century launched the tea-drinking habit on an unsuspecting world.

A thousand years ago China became the first nation to put its trust in paper money. And more recently it has added to civilisation's breadth with the Mao-suit, Mao-thought and mao-tai (unrelated to the late Chairman it is a potent white spirit noted for its efficacy in lubricating tongues and numbing minds).

Cheaper

Now, poised for its rush towards modernisation and technological development, China wants its people to come up with more inventions. Economic planners are already committed to buying much new technology from highly industrialised countries but they realise that in many fields it will be cheaper for China to create its own. And to give encouragement to the nation's inventors, its leadership has offered handsome cash lures for useful devices.

Today with the vast advances that have been made in science and technology, many are the amazing gadgets and inventions man has come up with.

KARMANTHA— the ONLY journal on industry in Sri Lanka today—being well aware of the ingenuity and versatility that the Sri Lankans are famed for, takes this opportunity to publish excerpts of an article written by John Hoffman in the FINANCIAL TIMES on the incentives offered by the Chinese Government to inventors in the hope that it would encourage and induce our inventors to write in to us about their own inventions.

The awards range in four grades from 1,000 Yuan (330 pounds) to 10,000 Yuan (3,300 pounds). Especially important inventions could earn even higher awards.

Announcing the incentive system, the Chinese press said it would be open to foreigners and Chinese living abroad. To qualify for an award, an invention must be a new scientific or technical achievement, the announcement says. Other stipulations are that nobody has invented it before that it is 'advanced' and that it has been proved to be usable.

Special committees have been set up to classify, examine and recommend inventions submitted to the State Scientific and Technological Commission. Separate procedures will apply to special inventions for millitary use.

Stagnation

The size of the awards is surprising even in a China which is taking note of the powerful effect to material incentives on productivity. During the years of the Cultural Revolution, a period of economic stagnation in China, any form of bonus or material incentives was taboo—an offence against a dominant puritanical view of socialist egalitarianism.

Last year, however, productivity bonuses were cautiously introduced in industry to cultivate the enthusiasm of workers, although they were limited to five or ten Yuans a month. Immediate productivity increases were recorded and the Chinese leadership quickly swept aside its ideological reservations.

Acknowledging that the proposed inventors' incentives might be questioned as excessive the People's Dailynews-papereditorialised:'Backwardation in science and technology and a dearth of inventions and discoveries is one reason why per capita income not only lags behind first and second world countries but is also lower than in most third world countries.

The policy of making awards for inventions is based on the recognition of differences existing in the society. In the overall picture, this policy is necessary to raise the living standards of all the people.

"We must base our policy on reality. In the course of construction we should let some areas, enterprises and working people get more pay and improved living standards as a result of their own greater efforts. This is the only way to encourage others to learn from them".

Important

The newspaper insists, though that money is not everything "In giving awards for inventions it is essential to combine honorary awards with material awards and put the stress on honorary awards.

So each successful inventor will receive, in addition to his cash, a medal and a certificate. Such recognition is undoubtedly important in the Chinese Communist system, public approbation has always carried a lot of weight. The pinnacle of honour for many workers is to have their names displayed as "model workers" on noticeboards at the factory gate.

The highest inventors' award—10,000 Yuan-is the equivalent of at least one years' salary for a moderately well-paid technical worker. Despite the ideology, that fact—rather than the prospect of a medal and a certificate—will be the driving force in most inventors' efforts to make China "a better mouse trap". (Financial Times).

From you to us...

If you have a grouse or just feel like writing, address your letters to

EDITOR,
Karmantha,
615, Galle Road,
Katubedde.

MANAMPERI AWARD FOR RESEARCH

The Cement Corporation found that the metal balls supplied by the Ceylon Steel Corporation for grinding cement clinkers unsatisfactory.

Their complaint was that these balls wore out much faster and also tended to break apart.

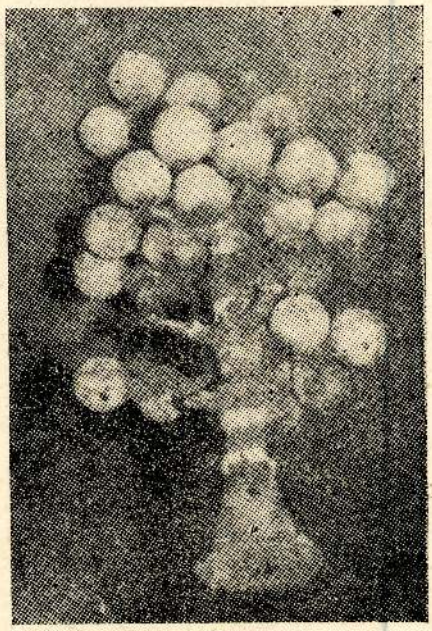
In order to find a solution to the problem, extensive studies were carried out by Mr. M. J. Edirisinghe, lecturer Department of Applied Sciences, Katubedda and Mr. D. K. Sarath Kumara, Metallurgist of the Ceylon Steel Corporation, under the guidance of Prof. Ranjit de Silva, Head of the Dept. of Applied Science.

The tests were mainly aimed at finding a process to eleminate blow holes and cavities and to obtain a product that is not only defect-free but also long-lasting. Therefore, primarily, the process that was at present being used, was studied and a series of tests were conducted to find out the optimum moisture content, permeability and the green strength of the moulding sand. Finally the dies, moulds, casting, pattern and procedure, drying procedure and the composition were all tested and modified.

A cost analysis carried out showed that the modified composition and casting procedure, not only resulted in a long lasting, but also a defect-free product.

However before the researchers are completely satisfied with the new process, the balls were being subjected to further tests at the Katubedda Campus.

Meanwhile, the researchers were the winners of the Manamperi Award for the paper they submitted on this, at the 1978 sessions of the SLAS.



The metal balls were found to be longer lasting and defect free after tests. On left are the balls that were supplied earlier. On right are the new ones.

Commonwealth plan for industrial growth

The Commonwealth Industry Ministers' conference which concluded its three-day deliberations recently agreed to put forward to heads of Government a framework for a Commonwealth action programme on industrial co-operation.

A communique, issued at the end of the conference which was attended by 25 Commonwealth countries, (including Sri Lanka) said the programme would further co-operation among Commonwealth nations and international and regional agencies and contribute to more rapid industrialisation of less developed members.

The Ministers recognised that transfer of technology at a reasonable cost and the redeployment of industries were important measures for the acceleration of industrialisation in developing countries. They acknowledged that the present meeting had proved valuable, and agreed to meet within three years to undertake a review of the action programme.

The conclusions and agreements reached at the conference would go before the heads of Government for endorsement in Lusaka in August next when the modalities of the proposed industrial development unit including a definition of its functions, proposed staffing and financial structure would be set out.

The conference took into account the special problems which faced the developing nations.

The Ministers stressed the need for collaborative action in a number of areas, including project identification and appraisal, manpower and entrepreneurial development, industrial infrastructure, national institutional arrangements, selection of appropriate technologies, procurement of finance and access to markets.

Specialists Commended

The Ministers who commended the team of specialists for producing a valuable set of practical propsals, noted that there were within the Commonwealth many appropriate institutions and a vast reservoir of complimentary capabilities with the willingness to help member countries. They emphasised the need to mobilise such resources which would yield benefits to donors and recipients alike and to the international community.

Programme

The Ministers wanted the Commonwealth Secretariat to initiate a suitable programme to enable small-scale enterpreneurs to undertake "exposure" visits to other developing and developed nations. They wanted the Secretariat to play a more active role in industrial development by promoting, supplementing and linking bilateral and multilateral programmes of co-operation in the industrial sector and thus aid developing member countries in making the best use of them.

Re-deployment of Industries

Indian Industry Minister, Mr. George Fernades, who was the Chairman of the Commonwealth Industry Ministers' Conference, and the Commonwealth Secretary-General, Mr. S. S. Ramphal, told newsmen that the working group of the conference would examine alternative arrangements for a minimum equity capital for industrial enterprises in developing member-countries, including the type of institution required, its size, structure, source of finance, method of operation and management.

About the agreement on the establishment of an industrial development unit, the communique issued at the conclusion of the conference said, the unit would mobilise capabilities to help solve specific industrial problems of member-countries and provide continuing help to developing nations in their industrial efforts.

The conference felt that the unit in consultation with the Secretariat should develop arrangements to expand the training opportunities available to developing countries in the promotion, establishment, management and operation of industrial enterprises.

They agreed that the requisite additional resources should be provided to ensure its effective implementation on the lines of an initial three-year programme costing £ five millions. The Ministers also recognised that in relation to need the programme was a modest one, but hoped that the resources available for it would be effectively enlarged through bilaterial arrangements.

The conference emphasised the importance of favourable international environment for boosting industrial development in developing countries. The Ministers reiterated the concern expressed by the Commonwealth Finance Ministers last September in Montreal over the rising trend in protectionism and its dangers for the world economy.

The need for reduction of barriers against export of manufactured and agricultural goods in which developing countries had a comparative advantage and for adoption of steps conducive to international investment were recognised. They also recognised that industrialisation in all countries would be enhanced by a free flow of industrialised goods and agricultural commodities. They hope that the action programme would create a more positive climate for development. (*Courtesy Hindu*)

CITRUS WASTE UTILISATION

Citrus fruits form a lion's share of the edible fruits produced in the country. Apart from direct consumption, large quantities of these fruits go for processing as squashes, juice and jams. A number of by-products are available from these fruit-based industries which at present are of little utility value. At best they can go for manure provided they are properly collected and composted.

The Central Food Technological Research Institute, Mysore, has developed processes for preparing pectin and lime oil from the waste as well as from lime fruits. This waste is said to be one of the richest sources of pectin containing nearly 20 to 25 per cent on dry basis. Lime oil and Citrates are other by products, available from the waste which are in good demand. Now they are imported.

Lime fruits are raised in a fairly large area in the country particularly in the southern States of Tamil Nadu, Maharashtra, Andhra Pradehs, Mysore as well as Punjab in the north. Estimates show that nearly 50 lakh tonnes of lime fruits (Citrus aurantifilia) are produced in the country. Nearly 16,000 tonnes of lime are to be processed to meet the country's requirement of lime oil—approximately 50 tonnes. More could be produced as this product has export potential also.

The CFTRI considers that it would be worthwhile to start with production of five to six tonnes of oil 40-50 tonnes of pectin and 70-90 tonnes of citrates initially in any of these lime producing tracts. Trials have been carried out on pilot plant scale of 10 kg. pectin capacity per batch and the raw materials required are all available indigenously.

In Florida, essential oils from citrus peel are processed into flavour chemicals. The juice vesicles (sacs) are dehydrated and used as a variety of food products and pectin also is got from the citrus waste. In addition, the seeds are removed from the cannery refuse and pulp processed into an edible oil and high quality protein. The seed oil from most major types of citrus has been found to be similar to cottonseed oil in acid composition. The presence of vitamin E (in the form of tocopherols) to the extent of 30 to 60 milligrams in 100 grams of oil enhances its nutritive value. The dry oil-free meal has high protein content suited for livestock feeding. The protein has been found to be equal in digestibility and biological value to that of soya bean protein.

Another interesting development of the utilisation of horticultural by-products is the process to extract pectin from mango peel. More than nine million tonnes of mangoes are produced annually in the country. The peel which forms 20 to 25 per cent of the fruits usually goes waste in the fruit manufacturing industry. The Bhadha Atomic Research Centre had developed a technique to extract pectin from mango peel. The pectin from mango peel is comparable in quality and grade to those obtained from orange peel and apple.

(*Hindu*)

The ABC of ....

(*Continued from page* 12)

dorsal line. This well separate the fish into two halves. It then splits laterally so that it separates into four lobes. If there are smaller pieces left as a result, these could also be dried separately.

Smoking

The fish, now cut into four lobes, should be placed on a wire mesh so that they are placed side by side. Care should be taken to ensure that they do not touch each other. There should be placed on a frame made of wood or metal. This structure should be about 2½' high. The fish must, then be smoked slowly for about 18 hours using either saw dust, paddy husk or coconut husk, as fuel. At the end of the process, the fish should be fairly dry. Then the pieces should be exposed to the sun during the day and be subject to smoke during the night.

This process should be repeated for 6 days, after which, the adhering skin and scales should be removed, if present.

Equipment

Inorder to handle 1½ cwts. of fresh fish per day, the following equipment is needed:

3'×2'×6" wooden framed boxes with wire mesh at the top & Bottom (wire mesh trays) 16 nos.
2'×3½'×2½" rack preferably of iron—2 nos.
5'×3'×2½" tables—02 nos.

This industry is economically viable on a small scale, if adequate supply of fish at a reasonable price could be ensured. Judging by the erratic supply at present from the exporting countries, it could easily be assumed that our supplies of Maldive fish from abroad are uncertain. Therefore it is obvious that there would be a steady local and perhaps even a foreign market for this product.

The IDB recently trained about 45 prospective entrepreneurs in the technical process of the manufacture and they have subsequently formed themselves into an association called The Sri Lanka Umbalakada Manufacturers Association, to promote the manufacture and distribution of this delicacy which of course is a good omen for the industry.

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 our 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.

* * * *

Productivity in small scale industries by S. V. S. Sharma.(SEDME Vol. V, No. 2 Sept. 1978) P. 1-8.

Emphasis on capital productivity and aspects of productivity are discussed with reference to both large and small scale industries.

Processes for the preparation of active Carbon by various methods such as carbonization, Dolomite Process and the Sulphate Process are described.

* * *

Fly ashfor cement industry by S. N. Bagchi. (Khadi-Gramodyog August, 1978). p. 551-555.

INDUSTRIAL INFORMATION SERVICE

Technology for Tiny sector by Ram K. Vepa (Khadi Gramodyog, Vol. XXV, No. 1 October 1978) p. 20-25.

Meeting the demands of the tiny sector would require a combined effort of the administrator and the scientist to make available the benefits of new production techniques.

* * *

Batch dryer for Paddy (Sendoc Bulletin, Vol. VI, No. 2, Feb. 1978) page 17.

A simple batch dryer consisting of a regular bin with a perforated floor. It is meant for simple farm level operation.

* * *

Banana fibre: a review of its properties and small-scale extraction and processing by G. C. Jarman and others. (Tropical Science Vol. 19, No. 4, 1977) p. 173-185.

The technical aspects of the small scale extraction and processing of fibre from the edible banana plant together with its physical and chemical properties are given.

* * *

Acetic Acid and a profit from wood distillation by D. F. Otheer. (Chemical and metallurgical Engineering, Vol. 42, No. 7, July 1935). p. 356-361.
Reprint 304

* * *

Active Carbon (Active Carbon by Hasslar) p. 1-6.

With further research and devising suitable machinery fly ash can be of immense use in the manufacture of cement.

* * *

Glass-fibre reinforced concrete products-Properties and applications. By John Jones and Thomas P. Lutz. Reprint: PCI Journal (USA) June 1977.

* * *

Chalk sticks for writing on School Chalkboards by. Dr. Louis Navias. New York: VITA, n.d.

Methods of preparation, entrusion pressing and casting, are dealt with. Reprint 229

* * *

A Chemical industry based on dry distillation of coconut shells by R. S. Poti (The Indian Coconut Journal, Dec. 1948) p. 36-43.

The process and the products of distillation, their commercial value, and machinery steam, fuel and power requirements are discussed. Reprint 144.

* * *

Coconut Shell Charcoal by Liu-Sheng Ts'Al and Kung-Yao Chuang. (Industrial and Engineering Chemistry, Vol. 34, No. 7) p. 812-813.

The effect of concentration of zinc chloride and of hydrochloric acid on activity is discussed. Reprint 306.

* * *

Copper, Zinc and Aluminium Sulphates (Chemical Digest, Vol. No. 9, September 1978) p. 3-4.

A product profile on the three most important inorganic salts of sulphuric acid.

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