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INDUSTRIAL PROSPECTS FOR MADRAS

BY THIRU S. SUBRAMANIAM

Chairman, Tariff Revision Committee.

AND

THIRU M. MAJUMDAR

Editor, Directorate of Commercial Publicity, Ministry of Commerce

Major Agricultural Crops: Madras State is fortunate to possess rich natural resources of agricultural origin which are not only adequate to meet its own food requirements but also to meet the raw material requirements of some of the well developed industries of the State. The principal food-grains produced by the State are rice, ragi, bajra, jowar, small millets and pulses other than tur, the relative share of the State in the all-India annual production of these crops being 10.8%, 17.6%, 8.0%, 6.3%, 20.6% and 5.1% respectively. Besides contributing a sizable share in the country's output of spices like chillies and cardamoms which earn valuable foreign exchange, Madras accounts for about 22% of the total production of groundnuts and about 10% of the total production of sesamum in the country. The share of Madras in the total Indian output of sugarcane was 6.6% and of tobacco was 8.3% in 1963-64. As much as 15.0% of the total production of coffee and 11.7% of the total production of tea in 1963, came from Madras State. Madras has a substantial share in the production of cotton, which amounted to 7.5% of the total Indian output in 1963-64. The average annual production of coir in Madras amounts to a little over 2% and of sisal a little over 14% of the estimated Indian outturn. The annual production of wool in the State

is estimated at 6% of the production in the whole country, while more than 50% of the total production of goat hair originates in Madras.

Livestock Produces: According to the Livestock census of 1961, Madras has a live-stock population of 24.6 million including 10.8 million heads of cattle. The production of hides in Madras is placed at 1486 thousand pieces and of skins at 4915 thousand pieces respectively, per year, representing 6.4% and 10.6% respectively of the estimated annual Indian output. The annual availability of cattle bones in the State, obtained mostly from naturally fallen animals, accounts for nearly 6.2% of the all-India total.

Other Natural Resources: The important mineral resources of the State comprise the lignite, limestone, gypsum and magnesite deposits and salt. The State also produces corundum, feldspar, fireclay, mica and road-metal. Among the metallic minerals, mention may be made of the bauxite reserves, the exploitation of which has been taken up. The beach sands of Kanyakumari contain ilmenite, monazite and zircon. Iron ore deposits have also been found in Salem.

Madras has extensive areas under cashew and rubber plantations. Madras is a sandalwood producing State but the total yield of other timber bamboos and canes in Madras forests is negligible as compared to the all-India availability. Other important forest products of Madras are essential oils, minor non-edible oilseeds, blue gum suitable for making paper pulp, natural tanstuffs and Kapok. The major fruits and vegetables grown in Madras are bananas, mangoes, citrus fruits, pineapples, potato and tapioca. The State has a sizable production of cured fish, crude shark liver oil and skate oil.

Major Industries: Of the Industries which are already developed in the State, some

are based primarily on the natural products of the State. The data in respect of State-wise production in 74 major industries given in the Monthly Statistics of the Production of Selected Industries of India indicate that the processing of coffee, tea, sugar and salt, and the manufacture of vanaspati, cotton yarn and cloth, chrome tanned hides, vegetable tanned hides, sulphuric acid, caustic soda, superphosphate, paints, enamels and varnish, soap, carbon dioxide gas, alumina ferric, cement, sanitarywares, stonewares, refractories, asbestos, cement products, finished steel brass sheets circles, wood screws, diesel engines, power driven pumps, sugar mill machinery, electric motors, power transformers, radio receivers, motor starters, automobiles, bicycles and spare parts thereof

and plastic moulded goods, are among the figures of output in respect of these industries major organized industries of Madras. The in Madras, are brought together below :

Industry	Unit	Production in Madras State and Total Indian Production in 1968	
		Madras	Total India
Coffee	Tonnes	8,812	58,884
Black tea	000 Kgs.	39,354	334,846
Salt	000 quintals	8,686	45,883
Sugar (1962-63)	Tonnes	104,639	2,159,744
Vanaspati	Quintals	129,895	3,835,150
Cotton yarn	000 Kgs.	151,789	892,574
Cotton cloth	000 metres	132,999	4,422,856
Chrome tanned hides	Nos.	203,971	1,086,089
Vegetable " "	Nos.	459,570	3,853,457
Sulphuric acid	Tonnes	72,904	567,928
Caustic soda	"	43,801	152,282
Super phosphate	"	144,287	580,020
Enamels, paints and varnishes	"	2,240	69,218
Soap	"	1,693	158,018
Carbon dioxide gas	"	1,930	8,284
Alumina ferric	"	866	69,910
Cement	"	1,281,192	9,354,803
Sanitarywares	"	1,710	7,918
Stoneware pipes	"	13,272	70,654
Stoneware—other kinds	"	1,956	8,088
Refractories	"	50,653	658,882
Asbestos cement products	"	34,908	307,815
Finished steel	000 tonnes	48.4	4,257.5
Brass steel/circles	Tonnes	2,744	22,647
Wood screws	Million Nos.	97.6	1,367.5
Diesel engines (Stationary)	Nos.	3,983	55,644
Power driven pumps	Nos.	69,700	150,418
Sugar mill machinery	Lakh Rs.	129	572
Electric motors	H. P.	102,416	1,183,183
Power transformers	K. V. A.	471,875	2,687,440
Radio receivers	Nos.	5,799	418,369
Motor starters	"	15,200	172,100
Automobiles	"	6,072	52,297
Bicycle parts (complete)	Rs. (000)	2,372	15,806
Plastic moulded goods	Million Nos.	311	881

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Apart from these manufactured goods figures of production of which in Madras are separately available, there are in the State several flour, rice and dhal mills, and also organised units producing milk foods and other dairy products, chocolate and sugar confectionery, edible oils other than vanaspathi, miscellaneous food preparations, soft drinks, cigars, snuff, silk goods, art-silk goods, knitted goods, footwear, wooden furniture, metal furniture, rubber tyres and tubes and other rubber products, inorganic fertilizers, man-made fibres, explosives, drugs and pharmaceuticals, cosmetics and toilet preparations, paper, matches, glue and gelatine, tiles, glass hollow ware, china ware and pottery, insulators, grinding wheels, iron and steel castings, forgings and structurals, razor blades, machine screws, enamelware, hardware, hand tools, and small tools, textile machinery, mining and construction machinery, rice, dhal and flour mill machinery, machine tools like reamers and milling cutters, earth moving machinery, agricultural implements, typewriters, storage battery and dry cells, motor cycles, railway wagons, surgical and scientific instruments, photographic and optical goods, jewellery, pens and pencils, buttons, brushes, toys and musical instruments. Manufacture of sheet glass, aluminium sheets and sewing machines has also commenced.

Prospects for Development: Integral Coach Factory at Perambur, the High Pressure Boiler Plant at Tiruchi, the Surgical Instruments Factory at Nandambakkam near Madras, the Teleprinter Factory near Madras and the Hindustan Photo Films Manufacturing Company at Ootacamund are examples of projects in the Public Sector. The exploitation of the lignite resources has opened up a vast potential for further development of basic industries, engineering as well as chemical. Lignite will meet a large part of the fuel needs of the growing industries and also yield various

by-products which the chemical industries will be able to utilise, for production of intermediate chemicals on which the fertilizers, plastics, insecticides, disinfectants and pharmaceuticals industries are based.

Further opportunities for heavy and light engineering industries will be created if a steel plant is established, utilizing the low grade iron ore of Salem and lignite from Neyveli. Further availability of base metals will create increased opportunities in the field of engineering industries, for expansion of capacity in respect of industrial machinery instruments, screws, iron and steel pipes, metal containers, small tools and hand tools for which the existing capacity is not adequate. Electrical industries could expand by the setting up of new units for the production of storage batteries, dry cells, electric fans and electric lamps. Besides, increased production in these sectors will open export outlets after meeting the domestic needs.

In the field of chemical and allied industries, there would be scope for development of fertilizers, ceramic insulators, sheet glass, papers and paper board, saw-milling, joinery and general wood working industries and establishment of industries based on alcohol which can be obtained from molasses, a by-product of the sugar industry. There is still a substantial import into India of the by-products of coal carbonisation and coal tar distillation, which can be reduced when tar production and distillation capacity is established fully under the Neyveli project.

Among the marine resources of Madras the pride of place goes to salt bitterns. Potassium chloride, magnesium sulphate, magnesium chloride and bromine can be recovered from the bitterns of marine salt works, if these bitterns are utilised and not thrown away as at present. The Madras coast

is the richest area for economic algae, which are valuable enough for processing. The shark fin industry can be developed through concerted efforts to expand shark fishing around the coast.

Scope for Small Industries: The minor oil-bearing seeds available in Madras State which can be exploited for the manufacture of soap and for several other industrial purposes are neem, karanja, mahua, undi and nahor seeds. The indigenous demand for geranium oil, and rhodinol, a constituent of geranium oil, is now being met largely by imports. If the plantations of rose geranium are extended, the production of geranium oil and isolation of rhodinol can be increased. Increased industrial utilisation of tobacco waste, thrown up during the processing of raw tobacco, for extraction of nicotine sulphate and nicotine acid, will reduce the country's dependence on imports of these products.

Tamarind seed is available in Madras State in large quantities. The tamarind kernel powder, which is used as sizing material for textiles, may be taken up for production on a commercial scale.

Raw bones of large and small animals available in the State are not collected fully. Bone meal, glue and gelatine, ossein, poultry feeds and di-calcium phosphate are some of the products prepared from bones and the

State could successfully undertake the manufacture of these products. The country has to import high grade gelatine required by the pharmaceutical and photographic industries. Manufacture of Ossein and high grade gelatine will yield di-calcium phosphate as a co-product.

The experiment of Madras State has already succeeded in industrialisation, despite a shortage of some non-agricultural basic materials in the past. The small-scale industries in particular have provided the much needed training and service facilities. The annual turnover of the production units in the industrial estates is of the order of Rs. 8 crores. The schemes for small-scale industrial co-operative are also making progress.

The production of handloom cloth during 1963-64 was more than 115 million yards. Further progress will be assured when the supply of yarn improves. Thirteen co-operative spinning mills are already in production.

Exports: More than Rs. 4 crores worth of 'Bleeding Madras' was exported during 1964, in addition to another Rs. 4 crores worth of other handloom goods. According to a review of the industrial development of the State in 1964-65, the contribution of the State to the country's exports was 11.6% in 1963-64 as against 9.8% in 1956-57. A higher export target is expected to be achieved for Madras in the coming years.

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PRODUCTIVITY

BY THIRU F. A. RYAN

Deputy Director, Central Small Industries Organization, Government of India

In the context of economic development of a farm or a factory, home or an office, no word has assumed greater importance and significance today than the word *Productivity*. All the world over higher productivity has rightly been recognised not as an end in itself but as a means of promoting social progress and strengthening economic foundations of human well-being.

The word simply means proper utilisation of available resources of time, money and energy and connotes a condemnation of waste of every type in every sphere of activity, be it production, distribution or consumption of goods and services. It tries to develop an attitude of mind and a constant urge to find cheaper, quicker, easier or safer ways of manufacturing a product, rendering a service or just doing a routine job. In other words it tries to minimise input in the form of time, money or effort and maximise output, lighten the tedium of the workers and make them work more humanely and for greater job satisfaction. It may be said that productivity stands for the ratio between the 'input' of the resources used up in the process of production and the 'output' of wealth produced in the form of goods and services.

Production is not productivity: The words *Production* and *Productivity* have com-

pletely different meanings and the one should not be confused with the other. One may increase production in a farm or a factory, by putting in more money, men or machines or spending more time or energy. Production merely connotes the volume of output regardless of the total cost or cost per unit of production and increase of production does not necessarily mean or result in productivity even though higher productivity will lead to more production. To illustrate this point clearly, supposing ten men working in a factory produce the same quantity of goods and services as twenty men working in other similar factory, production of the two factories are equal but their productivity is different. It is high in the first factory and low in the second.

Need for productivity: There is need for productivity wherever there is human activity. The home needs techniques to exercise economy in the household and the best and maximum utilization of the limited resources of the family. So also does the farm or the factory need productivity. Our homes, farms and factories are to be made more prosperous and flourishing so that they in their turn can build up the nation more prosperous and flourishing. The quality and cost of our goods and services must stand in competition against goods and services of other countries and only "Productivity" can achieve this.

Better productivity indeed means cost reduction to an industry which enables its products to compete in the market more effectively. Reduction of cost of production and consequently of the sale price leads to expansion of markets and greater profits to the industry. Increased profits enable expansion of the industry by expansion of investment.

To a nation higher productivity means more national wealth, higher standard of living and also more internal and external markets.

Higher productivity means higher wages to a worker. It may be pointed out that wages of workers are highest in countries where the level of productivity is the highest. It leads to shorter working hours, better working conditions, more leisure to enjoy goods and services and greater work satisfaction.

To say a word about the meaning and purposes of productivity to the consumer, it lowers for him the price of goods and services, improves their quality and thus gives him greater consumer satisfaction.

Tools of productivity: Tools of Productivity may be those external to the farm or the factory (home or the office) and those internal. Under the first category come the social, institutional or economic factors which are determined by Government or are dependent upon geographical factors or political circumstances. These factors include:

- (a) Availability of capital
- (b) Availability of material
- (c) Size of market
- (d) Mobility of resources
- (e) Level of economic activity
- (f) Quality of material
- (g) Degree of competition
- (h) Educational and training facilities
- (i) Taxation

- (j) Industrial research
- (k) Climatic conditions
- (l) Natural resources
- (m) Power resources etc.

Internal factors which constitute the basic tools which can be used in farms or factories for increasing productivity include:

- (a) Plant layout
- (b) Production planning
- (c) Management techniques
- (d) Production control
- (e) Material handling
- (f) Work study
- (g) Work simplification
- (h) Time and motion study
- (i) Cost control
- (j) Quality control
- (k) Product design
- (l) Standardisation
- (m) Specialization, etc.

Principles of productivity: The Productivity Seminar held at Delhi in 1957 outlined the principles of the Productivity movement and these principles constitute the basis of the productivity movement in India. These principles and the preamble to them are quoted at length below:

"For increasing the National wealth and per capita income, and for improving the standard of living, people must first be made aware of the significance of higher productivity as the means of achieving these objectives. It is therefore necessary to create among labour, management and the general public attitudes receptive to the idea of productivity, thus ensuring a favourable climate of opinion which would facilitate the introduction and application of modern techniques—social and technical—for increasing productivity. In a campaign for productivity full co-operation of the employers, labour, government and all other interests is indispensable."

INDUSTRIAL CO-OPERATION AND TEA INDUSTRY IN MADRAS STATE

By Thiru D. Mariasusai

During the last decade ending with 1965-66 the Madras State has made great strides in the Industrial development—large, medium and small scale industries. The growth of small scale industries has been so great and conspicuous that Madras State occupies a pride of place in the matter of qualitative and quantitative production of industrial and consumer goods. The Industrial Co-operatives have played a very prominent role in this regard, in that, the impact of industrial development on the common man has been tremendous as may be seen from the following extract of the observations of the Government made in the review on the Industrial Development in the decade in Madras State which was placed before the Legislature in February last year.

"The progress in the growth and development of Industrial Co-operatives has been *Phenomenal* during the decade. The number was negligible ten years ago but at the end of the Third Plan period we have 411 Industrial Co-operatives, providing employment to about 33,400 workers"

The pace of progress of the Industrial Co-operatives is being not only kept up but also accelerated under the small scale industries.

Industrial Co-operatives cover many types of industries, the Tea, hand-made matches, non-ferrous metalwares, light engineering (industrial products and consumer articles), wood working, brick making, footwear, readymade garments, synthetic gems, metal rolling mills, gold refinery, analytical laboratories, besides providing space and common facilities to small scale industrialists through the establishment of co-operative and private industrial estates. The Industrial Co-operatives have also played a prominent role in the development of traditional handicrafts in the Tamilnad. They cover almost all varieties of handicrafts goods for which our State is noted from time immemorial such as Art plate, Musical instruments, Bronze icons, Fine mats, Medium colour design mats, rough and coarse mats, Stone images, palm leaf products, Karigiri pottery, wooden toys, clay and papier mache toys, Bell metal lamps etc., Lace and embroidery, Sea shell toys, Pith articles, Sun hemp druggets, woollen druggets, artificial gem-cane articles, bamboo articles, artistic baskets etc. That our country was rich in arts and crafts is evidenced from the fact that *Vasodagama* and *Columbus* were in search of the then fabulous land of India. Coir Industrial Co-operatives are slowly gaining

ground and they are expected to make a substantial contribution to coconut fibre industry in the State when the programme of establishing a number of Co-operative coir mills in furtherance of the recommendations made by the Government of India Delegation to Ceylon is implemented. Co-operatives also cover sericulture industry. The growth of Industrial Co-operatives is assured since a separate financial structure has been built up in the Madras State Industrial Co-operative Bank Limited for meeting their credit requirements.

2. The Industrial Co-operative tea factories are the most successful ventures attempted in Industrial Co-operation, because the small tea growers for whom they have been formed derive unprecedented benefits. Pioneering work has been done in organising, establishing and running the first Industrial Co-operative Tea factory in a village at Yedakkadu near the first power house of the Kundah Hydel power project in the Nilgiris. A common man believed that co-operatives could play an important role in the dispensation of credit, distribution of agricultural requirements or consumer goods or marketing of agricultural produce or provision of urban and rural housing. About a decade ago, none would have believed that the co-operation could also embrace industrial production and distribution and such other activities as would contribute to the growth of the industrial economy in the State. Tea gardens and tea factories were the monopoly of the big planters most of whom were foreigners. None could have also hoped that the small tea growers could ever own and run successfully an up-to-date factory manufacturing exportable tea and that too through a co-operative venture. It was therefore an uphill task to have the approval for establishing the Kundah tea factory. Thanks to the Tea Board, Calcutta, the State and Central Governments, this pioneering attempt was allowed to be implemented with their financial

assistance. Initially this factory was started with a production capacity of 500 kgs per day, which has since been increased to 1200 kgs of *made tea*. The small tea growers who are the members and beneficiaries of this industrial undertaking evinced great interest and co-operated with the officials, with the result, the tea produced at this factory was of such superior quality that it fetched very high prices in the Cochin auctions where foreigners from Russia, Austria, England and others participated. These persons who were previously getting 45 paise per kg. of green leaves were paid 90 paise and at times 100 paise. Even then the factory made sizable profits and paid bonuses with reference to value of green leaves supplied to the factory. The thrift deposits collected at the rate of 6% of the value of green leaves accumulated to such an extent that each of them were not only able to meet the loan instalments of their share capital loans but also helped the institution in repaying the loan instalments due to the Tea Board. It is thus obvious that unlike any public project which is normally expected to give a return of 5% after a few years of its implementation, this project gave one hundred percent return on the next year of its implementation in that the small tea growers get double the prices for their leaves apart from State earning more foreign exchange for the quality tea produced by these factories which would otherwise be of poor quality unfit for export. In the wake of this success, a second tea factory with State Government funds with a daily production capacity of 1200 kgs of "made tea" was soon established at Kotagiri. It was an eye opener to all in the tea industry that a bought leaf factory for small tea growers on a co-operative basis could work as efficiently and successfully as any factory owned and run by big planters.

In view of the good progress made by the first Tea factory at Kundah, the Tea Board was willing to consider proposals for starting

similar factories. A preliminary survey of the potentialities for helping the small tea growers in the Nilgiris district has shown that the small tea growers own about 24,000 acres and that it would be feasible to cover all of them by establishing a number of Tea factories in three stages. It was also found that in addition to the establishment of these factories, it was necessary to help them to get better yield of tea leaves by application of fertilisers and control over plant diseases, pests etc., by use of insecticides, pesticides etc. The first stage was programmed to cover 8,000 acres. It was also found in the actual working an economical and viable unit should cover an area of 1000 acres for one factory which will produce 1200 kgs. of "made tea" per day. In addition to the two factories already existing at Kundah and Kotagiri which were subsequently expanded to cover a total area of 2000 acres six more factories covering an additional area of 6000 acres to complete the first stage of the programme were proposed to be established. A comprehensive scheme was drawn up for the establishment of additional six Tea factories and a Central organisation—a federation of all primary tea factories to provide service facilities to all the small tea grower members in the matter of supply of fertilisers, insecticides, pesticides etc. The capital cost of a factory was estimated at Rs. 9.10 lakhs of which a sum of Rs. 3.10 lakhs was proposed to be raised as share capital from the small growers and the balance of Rs. 6 lakhs met by a loan from the Tea Board. Out of the total share capital of Rs. 3.10 lakhs the small tea growers should pay in cash Rs. 1 lakh @ Rs. 100 per acre besides remitting Rs. 2 lakhs by raising share capital loans @ Rs. 200 per acre under the State Aid to Industries Act. The workers employed in the factory should remit Rs. 10,000 as their contribution to the share capital. The Central Service Society was to be provided with funds to the extent of Rs. 19.20 lakhs towards the

distribution of fertilisers (on half loan and half subsidy basis) and insecticides, pesticides etc., as loan. The total cost of the comprehensive scheme, including the two already established was estimated at Rs. 108.80 lakhs as shown below:

Production Programme

Area to be covered ...	8,000 acres
No. of factories ...	eight
Total cost of all eight factories ...	Rs. 72.80 lakhs
Share capital to be subscribed by growers ...	Rs. 24.00 lakhs
Production of "Made Tea" in all 8 factories.	9,600 kgs. per day

Service Facilities Programme

Distribution of fertilisers on half loan and half subsidy basis for 8 years at Rs. 8.40 lakhs per year Rs. 19.20 lakhs.

Distribution of insecticides, pesticides etc.

Loan at Rs. 5.60 lakhs per year for 8 years 16.80 lakhs.

Total cost of the scheme:

Rs. 108.80 lakhs.

With the prior approval of the Central Government, the Tea Board sanctioned the required funds which were routed through the Madras State Industrial Co-operative Bank making it responsible for recovering and repaying the loan instalments. The sanction order was received in the middle of March '65. Immediately six centres where small tea growers were concentrated were selected and six industrial co-operative societies were registered and started by collecting the prescribed share amounts from the small tea growers concerned. The Central service organisation—the Nilgiris Small Tea Growers Service Industrial Society Limited was also registered. The first instalment of funds was drawn and the programme of distribution

of fertilisers, insecticides and pesticides was put into execution before March '66. The work relating to the purchase of land, construction of factory buildings, purchase of machinery etc., was also taken up on hand. To ensure speedy implementation, the Government constituted a purchase committee with Thiru T. N. Lakshminarayanan, I.A.S., Secretary to Government, Industries, Labour and Housing Department as the Chairman and the presidents of all the eight tea factories as members. Thanks to the efforts of the Chairman, expeditious steps were taken to negotiate with the suppliers of machinery viz., Messrs. Marshall & Sons, their agents Messrs. Harrison Crossfield, the Davidson of India (Private) Limited. Competitive rates (rock bottom prices) were secured and orders placed with all conditions, schedule of deliveries etc. The Committee also decided to entrust the construction of the factory building to the Superintending Engineer of this Department who is assisted by a special division consisting of one Executive Engineer 4 Assistant Engineers besides other staff, their full costs including leave salary and pension and other contributions being debited to the construction account. The Superintending Engineer (Construction) was also made a member of the Committee. The Superintending Engineer (Construction) and his technical officers especially the Executive Engineer, Coonoor spared no pains in executing the work in good time. The work of Indco Tea Factory (3) at Karumbalam and the Indco Tea Factory (4) at Kilkotagiri has already been completed and that in regard to the remaining four is nearing completion. In the execution of the works at Kilkotagiri its production capacity had to be increased from 1,200 Kgs. to 2,000 Kgs. in view of the larger acreage of tea gardens in that area. These two factories which were inaugurated on the 26th and 27th December, 1966 by Thiru R. Venkataraman, M. A., B. L., the then Minister for Industries

under the Presidentship of Thiru T. N. Lakshminarayanan, I. A. S., Chairman of the Special Committee and member of the Tea Board, will serve 2,500 acres owned by small tea growers producing 8,000 kgs. of "made tea" valued roughly at Rs. 18,000 per day or Rs. 54.00 lakhs worth made tea per annum. The remaining 4 tea factories the 5th at Balacola, the 6th at T. Oranalli, the 7th at Manjoor and the 8th at Ithalar will be commissioned within two months from now. A ninth tea factory to serve the small tea growers in Gudalur taluk has been registered and the funds for the factory are expected to be sanctioned by the Tea Board shortly.

When he visited the Nilgiris in the first week of May, 1966, Sri Bhagwan Singh, I. A. S., the Chairman, Tea Board reviewed the progress of implementation of the comprehensive scheme. It was indeed good of him to have not only appreciated the efforts taken by the Madras Government but also was very keen to promote further the cause of the small tea growers in the Nilgiris. He held discussion on various measures to achieve the goal. Among the various proposals then discussed, the following concrete schemes have already been submitted to the State Government for being recommended to the Tea Board.

- (i) To provide funds to the small tea growers to bring an additional area of 5,000 acres under tea cultivation during the IVth Plan period. Each small tea grower will be given a loan of Rs. 4,000 per acre. The total of Rs. 200 lakhs required for the purpose will be routed through the Madras State Industrial Co-operative Bank and the Primary Industrial Co-operative Tea Factory. The loan is repayable in 15 years, the repayment of the loan commencing after the expiry of the 7th year from the date of disbursement of the first instalment of loan. Rs. 200.00 lakhs.

- (ii) Establishment of the second batch of 8 tea factories covering an area of 8,000 acres Rs. 86.24 lakhs.
- (iii) The distribution of fertilisers on half subsidy and half loan basis and insecticides and pesticides on loan basis to small tea growers who are to be served by these 8 new factories covering 8,000 acres Rs. 21.80 lakhs.
- (iv) At the suggestion of the Tea Board, it is proposed to establish a new Industrial Co-operative for distribution of fertilisers to persons owning more than 10 acres and below 50 acres covering 9,000 acres at a cost of Rs. 25.97 lakhs.

The total cost of these schemes amounts to Rs. 334.51 lakhs.

Besides these new proposals, the following proposals are under consideration and in course of time will be placed before the Tea Board for its approval.

- (a) The establishment of a Central blending factory soon after the commissioning the ninth and the second batch of eight factories.
- (b) The establishment of a service common facility workshop cum work oriented Industrial Training Centre for the sons and dependents of the employees of the tea industry in Nilgiris for production of light duty equipment required by the Industrial co-operatives and private tea factories, such as, tea sorter, withering troughs, sifters, trolleys, nails and tin plates for tea chests, aluminium foils etc.
- (c) Imparting training to the officers in tea cultivation and tea manufacture in Toolai and other training institutions.

In conclusion it may be stated that the development of small tea industry in the State especially in the Nilgiris will be so great as to contribute to the growth of industrial economy of the State in a very big way.

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ALUMINIZING

The term "Aluminizing" is applied to processes by which a thin layer of aluminium is either deposited or applied over a base metal. This is but one specific application of techniques connected by a broader term "metallizing" which comprise processes employed to leave a thin film of a desired metal on articles of other metallic or non-metallic bodies. The purpose of such a coating may have different objects, but mainly could be divided into two broad ones namely decorative and protective. A third application could be to make a non-conducting article electrically conductive. While noble metals are the best for all these purposes their use is limited because of their prohibitive cost.

The main application of metal coating in industry is in the field of corrosion prevention. Industry employs many items of machinery and equipment and these are mainly made of iron or steel on account of the abundance of supply and low cost, and their possessing the necessary strength. The drawback is the nature of the iron or steel which is easily attacked by chemical environments, even the mildest one like a humid atmosphere. Hence it is necessary to devise means to take advantage of the other excellent properties of such articles and structures striving at the same time to over-come the serious drawback of atmospheric and chemical corrosion.

For the above purpose the simplest process that has been employed was to coat the articles with Zinc and the process is termed "galvanization." Galvanized articles have been quite versatile in their applications. The application of the Zinc coating is further very easy and thus has found universal application.

But in recent times an alternative protective metal coating has been attempted with success and in fact with better effect for corrosion prevention, especially where in addition to corrosive environments, the articles are subjected to fairly high temperatures. Aluminium has been proved to be effective and in fact better in some applications than zinc.

The present day conditions in our country are such that aluminizing has to be adopted in very large measures; in fact it would be mandatory to switch over to aluminizing wherever galvanizing was employed, because our production of zinc is insignificant and our requirements have to be met mainly by importation. The country produces enough aluminium that would be required and thus considerable foreign exchange could be saved.

Aluminium has been as effective and in some respects better than Zinc for protecting iron and steel. The mechanism of protection acts in a dual manner under different conditions. In soft water it acts cathodic as a noble metal coating. In sea water and some fresh water containing sulphates and chlorine the polarity of the iron aluminium couple is reversed and the aluminium behaves as a sacrificial coating and protects steel cathodically. Thus aluminized articles resist rusting in industrial and sea coast atmospheres. The aluminium coating also markedly decreases oxidation at higher temperatures. An added advantage is that lesser weight of metal is required to coat the same area of metal to the same thickness than Zinc as aluminium is a lighter metal.

A variety of methods have been employed to produce a satisfactory coating of aluminium on iron and steel :—

1. Calorizing or Alitizing, based on heating articles packed in aluminium or alloy powder in contact.
2. Spraying or metallizing where molten metal is applied in the form of an atomized mist.
3. Cladding:
4. Casting aluminium around steel or vice versa.
5. Vacuum metallizing by vaporizing the aluminium under vacuum and depositing it on the article.
6. Hot dipping where the article after cleaning is coated by immersing it in molten aluminium.

(b) *Chemical Methods:*

1. Based on the reaction of iron with aluminium chloride;
2. Electro deposition of aluminium from a bath of its salts.

The choice of the various processes is dictated by the conditions of service, cost and ease of manipulation. For irregular shapes, any of the processes except cladding, is suitable, but commercial coating of sheets, wires, or strips generally employs the hot dipping process.

Brief descriptions of the several processes are appended below indicating the broad principles:

1. Calorizing or alitizing is a process originally developed by General Electric. The steel surface is cleaned by sand blasting to free it from scales. The articles are packed in air tight boxes with the calorizing powder and heated for a number of hours at temperatures between 845-925°C. The calorizing powder is a mixture of aluminium, alumina with small

percentages of Zinc, Ammonium Chloride and graphite. The calorizing box is kept in a non-oxidizing atmosphere either by hydrogen or by one way valves permitting only exit of vapours. The ammonium chloride vapour is expected to expel any air already present. Heating for 4-5 hours produces a coating of .001 to .006" thickness depending on the composition of the steel. Prolonged heating would result in part of the aluminium to diffuse into the steel and reduce the coating to about 25%. This is claimed to improve the ductility and toughness of the coating. The steel is also hot worked for further processing. (Calorized steel is resistant to sulphurous gases). Typical cases of calorized steel applications are :—Metal heat treatment, and case hardening boxes, annealing pans and trays, furnace door frames, baff plates, dampers, ash chutes, iron ore roasting furnaces, firing nozzles, muffles and heat exchangers. Calorizing also increases the life of heat resisting nickel chrome steels and alloys.

2. *Spray metallizing* :—The aluminium is applied on the thoroughly cleaned and roughened surfaces of the articles by a spray of molten metal. The commonly used type of apparatus is a "wiregun" where aluminium wire is fed into an oxy-acetylene or Oxy-hydrogen flame by an air driven turbine. The speed is adjusted to ensure continuous melting and atomization of the aluminium by an air blast at 50-60 lbs. pressure. The wire gun method is also called "Schoop spraying." The alternative appliance is a "Powder Gun" in which aluminium powder is forced into the flame by suction produced at the nozzle of the gun. The base metal surface is prepared by pickling followed by sand blasting. The coating obtained is apt to be porous and this is generally sprayed again with sodium or Ethyl silicate to seal it up. The adhesion by the coating is only mechanical and there is no alloy bond. The adhesion is improved by a

diffusion annealing treatment by maintaining the temperature at about 845-1010° C for 4 to 5 hours.

The spray coating process is specially suitable to large structures or sections that are not amenable to dipping or calorizing. The process does not involve expensive equipment. Types of commercial products economically metallised include air craft exhaust parts, damper plates, heat treatment pots and furnace and kiln parts.

3. *Cladding* :—This process in vogue for many years in Germany achieves a solid bonding of aluminium and the base metal. This is particularly applicable to strips. In this process, aluminium strip is cold rolled to about 0.2 mm thickness and after annealing is coiled above and below the steel strip on special rolls mounted on a bonding roll stand. These are then rolled under high tension and at about 100-200°C which is produced by the rolling process itself. The bonding rolls are about 8" in dia and run at about 50 feet per minute. The strip leaving the bonding mill is rolled under tension, re-rolled in a conventional mill to the desired thickness and annealed between 535 to 550°C for 10-15 hours. Clad steel finds applications under very severe corrosive conditions.

4. *Peripheral casting* :—This process goes in the name of the "Al fin" process, achieving integral bonding of aluminium or aluminium alloys on steel parts that require high strength, thermal and electrical conductivity completed with corrosion resistance. The process was developed for producing aluminium finned barrels of aero engines and plane exhaust heat exchangers and composite gears. The process employs casting aluminium against a specially prepared steel surface precoated with aluminium and machined. Al fin cylinder barrels are prepared by casting aluminium ruffs on steel barrels in a permanent moulds and machining in automatic fin-cutting machine. The process combines the excellent high temperature

corrosion resistance and high thermal conductivity of aluminium with the strength of steel. Steel backed aluminium bearings offer flexibility of design and improved performance. They have superior corrosion resistance, low friction, high load carrying capacity and excellent fatigue properties.

5. Vacuum metallizing is of interest in that aluminium was one of the first metals coated on materials under vacuum. The coating is achieved by vaporizing aluminium under high vacuum in presence of the article. The coating is very thin and is mainly decorative being used for coating toys, jewellery, automobile dash boards etc. The process has also been employed to coat air craft parts having tensile strength of 200 tons per sq. inch and subject to heavy corrosion.

6. *Hot dip aluminizing* :—The commercial coating of steel sheets, strip or wire by hot dipping has many advantages over other processes. The essential requirements of the process are careful steel surface preparation and successful prevention of oxide films on the molten bath surface.

In a method developed by Fink, the basis of the "Alplate" process the steel wire or strip is pickled, cleaned, dried and passed through furnace having a hydrogen atmosphere at 900-1000°C and then into the aluminium bath maintained at 700-760°C. This pretreatment in hydrogen imparts a bright clean surface and prepacks the steel in hydrogen which improves the bonding between aluminium and the iron. Since the wire or article enters the bath at a high temperature the contact time is limited and the thickness is maintained at a minimum.

The Armco steel corporation process involves oxidation of the steel and subsequent reduction of the oxide film under controlled conditions prior to entering the aluminium bath.

Other hot dip processes employ a molten flux in place of a controlled atmosphere. The flux used is a fluoride or chloride or a double chloride. In one of the processes, the first

furnace contains molten flux, and the next molten flux floating on molten aluminium. It is also claimed that satisfactory coatings are obtained by first aluminizing the article and then immersing the articles in the molten bath sufficient to dissolve the aluminized coating. Small quantities of other metals added to the aluminium bath modify the thickness of the interface alloy layer. Beryllium is effective in producing a more ductile coating. Silicon has a similar effect, but in the amounts in which it has to be employed rather dullens the aluminium coat whereas beryllium maintains the brightness of the coating. Misch metal additions (48.50% cerium 38% lanthanum and balance other earths) also improve the coating finish.

Investigations in our own country have resulted in developing number of techniques for hot dip coating and in the use of fluxes in various forms like water solutions or organic fluxes like linseed oil. Some of these are patented and are available for exploitation.

(b) Chemical processes :—

1. One process is based on the reaction that occurs when aluminium chloride comes in contact with clean iron surface at about 930°C. But this process is not of much commercial use since the coating got is too thin to withstand corrosion or oxidation.

2. **Electroplating** :—Aluminium can be electrolytically deposited on steel using various plating baths consisting of anhydrous electrolytes consisting of aluminium alkali chloride mixtures or electrolytes containing aluminium salts in Ethylbromide or benzol.

Satisfactory aluminium plating could be obtained with a bath containing 80% aluminium chloride and 20% sodium chloride maintained at 175°C. The voltage depends on the cellshape averaging about 0.5 volts per inch of inter electrode spacing at 15 amps. per sq. ft. current density. Lower current densities produce poor adherence while higher densities give

a matt surface finish. Flux grades of aluminium and sodium chloride and aluminium anodes of 25 grade can be used. The Steel parts are cleaned by hydrochloric acid, rinsed and wiped dry. While melting the salts the aluminium chloride is placed below the sodium chloride to prevent the action of moisture of the Air. Agitation of the bath is helpful and higher current densities can be used. Aluminium chloride which is lost by fuming or hydrolysis has to be frequently replenished. A current efficiency of about 80% is attainable and plating proceeds at a rate of about 0.8 gms. per amp. or .0008 inch per hour at 18 amps. per sq. foot.

Comparison of the various processes :— The selection of a particular process for the aluminium coating of steel is influenced by the expected service and by economic considerations.

For large scale production the calorizing and hot dip process are suitable because of initial expensive installations. In the spray metallizing process though costly per unit, coated area requires minimum equipment and can be used for intermittent production and for large and immovable shapes. The sprayed coatings can by annealing be made to approach the performance of calorized coatings.

A rating of the various processes shows that maximum thickness are obtainable by calorizing and spraying followed by hot dipping and for continuity of coating cladding and hot dipping stand first followed by electroplating and spraying. In considerations of cost, hot dipping is the cheapest followed by cladding and electrodeposition and calorizing while the costliest is the spraying.

Conclusion :—In the context of difficult foreign exchange conditions and increasing awareness of the necessity of import substitution, switch over to aluminizing will go a long way in achieving the objective. Several entrepreneurs have already taken to this process and it is possible to explore the possibility of increasing applications of aluminizing thus resulting in minimizing of the use of the scarcely available Zinc which has been used all along for steel coating.

MAGNESIUM (Sorel) CEMENT

THIRU P. M. TRIVEDI & THIRU B. K. SHUKLA

Central Salt and Marine Chemicals Research Institute, Bhavnagar

Magnesium oxychloride is a very good building material on account of some of its useful mechanical properties. This cement can be used either in the form of jointless flooring or as tiles. The method of laying the flooring and preparing the tiles are discussed together with the cost for both.

Magnesium oxychloride cement was first described by a French chemist Stanislaus Sorel in 1887. Formed by the reaction between magnesium oxide and magnesium chloride, it was found to possess exceedingly valuable cementing properties; and ever since then, sorel cement has been an important building material. In India the flooring of the railway compartments are made of this cement. The jointless floorings of this cement are laid in factory sheds, hospitals, office rooms etc. The cast articles such as tiles, table tops, name plates, paper weights and wall boards etc., can be prepared out of this cement. It is said that in U. S. A., 100 million square feet of floorings are laid every year.

The wider applications of this cement are due to some of the useful characteristics, which are discussed below:

Curing time : The oxychloride cement needs only two days' time for curing as compared with reinforced cement concrete and cement tiles which require about 3 weeks.

High strength : The oxychloride cement possesses high early strength. The transverse,

tensile and compressive strengths are above 2,800, 1,000 and 7,500 lbs./sq. in. respectively for a correctly made cement.

Appearance : The cement can take a very fine finish. In case of tiles, a smooth glossy surface can be obtained without any processing after the tile is set in the mould.

Subfloor : This cement can be laid on any kind of firmly held subfloor. In case of even surface, (of subfloor) the latter should be made rough and irregular for better bonding.

Miscellaneous : This cement is light, resilient and wear resistant. It is non-inflammable and is said to possess germicidal properties.

RAW MATERIALS

As the name suggests, this cement is made from calcined magnesite, magnesium chloride and fillers such as sand, saw dust, asbestos etc.

Calcined magnesite : As specified by I. S. 657—1962, caustic calcined magnesite with a minimum of 87 per cent magnesium oxide content and 98 per cent of the powder passing through 100 BS sieve is used. But has been observed that for optimum physical properties, the dry mix should contain a minimum of 50 percent of the total magnesium oxide. If impurities are within limits, a inferior grade of magnesite calcined at about 900°—1,000°C for 2 hours can also be used. Usually the calcium oxide impurity in Indian magnesite is not so high as to affect the

mechanical properties of the cast articles. A large number of trials have been carried out using calcined magnesite containing 2.2 per cent calcium oxide and 80.85 per cent magnesium oxide. It has been observed that the use of such magnesia does not materially affect the mechanical properties of the cast articles.

Magnesium chloride solution (22° Be'): In salt farms, the tail liquor, after the separation of common salt, called sea bittern, contains MgCl₂ 12 and MgSO₄ 7.5 per cent w/v. If this bittern is evaporated further, mixed salt (containing potassium) is separated. The tail liquor from this is highly concentrated (36-37° Be'). If the sulphate content of this liquor is 1 to 1.5 per cent, the same can be diluted to 22° Be', and used. Alternatively

commercial fused magnesium chloride solution of 22° Be' is used.

Fillers: Sand, sawdust, asbestos, stone chips etc., as specified in I. S. 857—1962 are used.

As discussed earlier, the two principal applications of this cement are jointless flooring and tiles. A brief account of these is given below:

JOINTLESS FLOORING

The flooring is done on a rough cement mortar subfloor. A network of wooden strips is laid on and fixed to the subfloor by wooden gutties, which are at a distance of about 0.5 m. The flooring is laid in two coats. The base coat is made up of calcined magnesite, wood powder and stone chips in the ratio 1:1:5.

The size of the stone chips should be one-third that of the depth of the base coat. Sufficient amount of magnesium chloride solution (22° Be') is added to the dry mix to get a workable consistency. After laying the wet mass is then pressed down with a wooden puddle. On the base coat, a second coat made up of calcined magnesite, wood flour and finely ground quartz in the ratio of 2:0.5:1 is laid. A suitable colouring matter is added. The solution of magnesium chloride is then added, just enough to bring the mix to a workable consistency. The wet mass is then transferred on to the base coat and levelled with a trowel. A skilled mason can bring about a fine smooth finish to the top coat. The flooring so laid should be protected from direct sunshine, water and foot traffic at least for two days. Then the flooring is cleaned with a piece of felt and a layer of double boiled linseed oil applied to reduce the porosity of the floor. From the data obtained by laying such a flooring over an area of 12.5 sq. m. (190 sq. ft.), it is estimated that the cost of laying comes to about Rs. 95/9.3 sq. m. (100 sq. ft.).

TILES

The oxychloride cement tiles have fine glossy surface. In case of Portland cement tiles, the smoothness can be obtained only after the tiles have been polished by an emery wheel. The glossy surface of the sorel cement tiles, obtained without any further processing after setting, depends upon the surface with which it is in contact during the process of

setting. When glass plates are used, these impart a highly glossy surface to the tiles, but the breakages with such plates are unusually high, raising the cost of production. A number of different smooth surfaces have been tried, both from the point of view of gloss and maintenance. Finally it is observed that the use of sunmica or such other polished sheet produce sufficiently glossy surface and reduce the maintenance cost. The design of the mould and base plates is so made that the base plates with wet mass can be detached from the mould easily and conveniently; so that with fewer number moulds a large number of tiles can be prepared.

A dry mix containing calcined magnesite, sand and saw dust in the proportion of 8:8:1 with requisite quantity of colouring matter is prepared in a double motion mixer. Magnesium chloride solution (22° Be') is then added to bring the mass to a workable consistency. The wet mass is then placed on the polished surface of the moulds. The moulds with wet mass are then transferred to a tapping stage and tapped for 4—5 minutes at 200—250 rpm. This tapping not only consolidates the mass but also removes the fine air gaps which otherwise makes the surface of the tile uneven and full of holes. After tapping, the moulds with wet mass are set aside undisturbed. After about 2 hours, the base plates are removed from the moulds with the wet mass and kept over-night on a rack undisturbed. The mould is cleaned (washed) and is fitted with another



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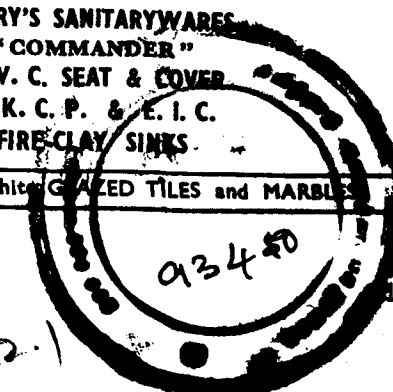
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base plate. Next day the set tiles are detached from the base plates. The tiles are coated with double boiled linseed oil and then kept under pressure by stacking them with their polished surfaces facing each other, to prevent warping.

A unit to manufacture 60,000 tiles in a year (200 tiles per day) can be set up with an initial investment of Rs. 50,000. The cost of production, based on the data collected from a unit at present working at the Central Salt & Marine Chemicals Research Institute, Bhavnagar works out at Rs. 80/9-8 sq. m. (100 sq. ft.) of tiles. The analysis of the cost factors shows that the calcined magnesite alone accounts for 60 per cent of the cost of raw materials. It is therefore clear that the cost of production of the tiles can be reduced at the places where calcined magnesite is available at a cheaper rate.

The details about the technique and cost of production of jointless flooring and tiles have been prepared at the Institute. Relevant literature and technical assistance for the above can be obtained from Director, Central Salt and Marine Chemicals Research Institute, Bhavnagar (Gujarat).

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References:

- (1) SOREL, S. T.; "Compt. Rend." 65 (1867), 102 — 4.
- (2) FARRELL, M. A. and WOLFF, R. T.: "Ind. Eng. Chem." 33, (9) (1941) 1186.
- (3) TRIVEDI, P. M. and SHUKLA, B. K.; "Salt Research & Industry" 3, (2) (1966) 66 — 68.
- (4) TRIVEDI, P. M. and SHUKLA, B. K.;

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A PERMANENT SMALL INDUSTRY EXHIBITION SET UP AT GUINDY ESTATE

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SMALL SCALE SECTOR

The remarkable growth of small scale industries which have been assisted by various schemes under the Five-Year Plans by way of factory accommodation at subsidised rent, financial assistance by agencies sponsored by Government, hire-purchase of machinery, technical know-how etc., and which at present contribute over a third to the national industrial production is amply illustrated by the permanent Small Industry Exhibition opened at the Guindy Industrial Estate.

The exhibition was inaugurated by Thiru K. Kamaraj, the Congress President on the 6th October 1966. Thiru M. Bhaktavatsalam, the then Chief Minister of Madras presided over the function. Thiru D. Sanjivayya, the then Union Minister of Industry delivered the Welcome Address. Thiru R. Venkataraman, the then Minister for Industries, Madras spoke on the occasion. The function began with the reading of messages received by Sri T. R. V. Chari, Director of the Small Industries Service Institute. Messrs R. Ganesan, President, Madras State Small Scale Industries Association, T. S. Santhanam, Managing Director of Sundaram Motors and E. C. P.

Prabhakar, the then Director of Industries and Commerce, Madras were the guest speakers on the occasion. Dr. S. T. Merani, the then Development Commissioner of Small Scale Industries proposed the vote of thanks.

The exhibition has been jointly organised by the Madras State Small Scale Industries Association, Small Industries Service Institute and the Department of Industries and Commerce, Madras. The products displayed over an area of about 8,000 square feet in the premises of A-1 and A-2 of the Guindy Estate range from a wide variety of consumer goods to sophisticated end-products and cover quite a good number of intermediates in the form of components and industrial goods supplied to numerous large scale and medium industries. The establishment of this exhibition serves to show what the small industries are producing and their potential for further development, to highlight the part played by this sector in the field of ancillaries and finally to inform the community that the small scale industry movement can effectively help to attain the social and economic objectives of planned industrial development of our country.

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RAPID AND REMARKABLE GROWTH OF SMALL SCALE INDUSTRIES IN MADRAS STATE

THE INITIATIVE AND ENTHUSIASM EVINCED
BY ENTREPRENEURS EARN REPUTATION

The rapid development of Small Scale Industries in Madras was in a great measure due to the enthusiasm of the entrepreneurs and in the order of priority of those who contributed to the growth of small scale industries in Madras State, the small scale industrialists occupied the pride of place. This was the observation made by Thiru R. Venkataraman, the former Minister for Industries in his address on the occasion of the inauguration of the Small Industries Exhibition at Guindy Estate.

Thiru E. C. P. Prabhakar, the then Director of Industries and Commerce, Madras paid a tribute to the new entrepreneurs and small industrialists for the magnificent manner in which they faced their crucial period of the past years. He said that it only spoke highly of the calibre of men that have entered the field of industries. He observed that in fact a new society had been born with men of courage, determination and foresight.

The following are the full texts of the speeches delivered by the then Minister for Industries and Director of Industries and Commerce, Madras on the occasion:

Address by Thiru R. Venkataraman, the then Minister for Industries, Madras:

The importance of Small-Scale Industries is not fully realised. 90% of the factories registered under the Factories Act in the whole of India are Small Scale Industries. Of the entire industrial production, one-third comes

from small scale industries. Therefore, it is necessary that we should give a place of importance to this small scale sector. In our own State we have about 10,000 registered Small Scale Units giving employment to 2 lakhs of people. There are a large number of unregistered units and there is no account or register kept of the unregistered units. It is my estimate that there will be an equal number of unregistered units, as we have registered units. In our Industrial Estates, we have provided direct employment to 10,000 artisans and we are providing indirect, secondary and tertiary employment to the tune of 30 to 40 thousand workers.

ENTHUSIASTIC ENTREPRENEURS

The rapid development of small scale industries in Madras in a great measure is due to the enthusiasm of our small scale industrialists. If I am asked to name in order of priority those who have contributed to the growth of small scale industries in Madras State, I would give the pride of place to the small scale industrialists themselves. They have shown a remarkable awareness of the potential of this field and they have come forward to risk their meagre resources in order to develop this small scale sector. Several associations which have been formed in this state under the able leadership of people like Mr. Ganesan, Mr. Nathan and Mr. Parthasarathi have carried the message of small scale industries through the length and breadth of the State. They

did not confine their activities only to Madras. But on the other hand they have attended almost every one of the District Industries Seminars which the Madras Government organised and tried to encourage people, who were vacillating, who were doubtful, who were nervous and anxious to come forward, by seeing and following their own example.

I am glad to say that the Small Industries Service Institute whose reports are valuable have been of immense assistance in developing the small scale industries particularly in Madras State.

RENT REDUCTION

We have started a number of rural industrial estates and we have come across one problem. In the Industrial Estate in cities like Madras, Madurai and Tiruchirapalli the rent charged are comparatively lower than the rents charged by others. In the private sector if you want to have a similar accommodation it will cost very much more and you will not have all these facilities. But in the rural areas like Pudukottai or Sivaganga or Kovilpatti I think private spaces are available at lower rates than the economic rents charged by the Government for its Industrial Estates. During my tour round many of these Industrial Estates I have realised this and I have, therefore, decided to reduce the rent. I am very happy to announce, as Mr. Sanjivayya did, that in the case of Rural Industrial Estates the rent will be reduced from 7 paise per sq. foot to 5 paise per sq. foot.

RAW MATERIALS

The main problem for the small scale industrialists is the problem of raw materials. The Congress President has highlighted this. Just as one who is interested in the welfare of the poor people goes and enquires into his household problems and difficulties, Sri Kamaraj has been going round many of the Small Scale Units and asking them what

exactly their problems and their worries were. Very often they have told him that they were not able to get enough raw materials for even running one shift to the full. Sir, this has been a great headache and particularly during the year 1964-65, the worst sufferers were the Small Scale Industrialists and they were not even able to run to 25 or 30% of their capacity. I am very happy that Sri Sanjivayya had made some announcements today. I wish we have more functions like this and if every time Mr. Sanjivayya can be induced to make more announcements like this, we will be all very happy. I am very glad that he has announced that there will be a liberalisation of the import of raw materials not only in the special industries categories, but also in the other non-priority industries. I do hope that the liberalisation will take effect very soon and people will get enough scarce materials like non-ferrous metals and so on.

FINANCE FOR INDUSTRIES

There is one other problem which has not been solved and I have been trying to break my head against that wall. And that is the difficulty of finding finance for the industries. This is not a problem peculiar only to the Small Scale Industries. It appears to be a problem equally big for the large scale industries. Well, on the one hand liberal import licences are given. The credit squeeze on the other hand makes it difficult for anybody to get enough money to import the various items given to them under the liberalised import licence scheme with the result, not having enough money and not commanding enough credit facilities, many of these import licences are on the point of becoming only scraps of paper. The men go only flashing import licences and saying we are having import licences for so much. But they will not be able to import anything because the banks refuse to give credit. The cost of the imports have gone up by 60%. But,

there is a credit squeeze on the industrialists. The squeeze is felt greater by the Small Scale Industry. I have, therefore, made a special appeal to the Union Finance Minister that liberal credit policies should accompany the devaluation. Otherwise *the grant of liberal import licence without liberal credit policy will only result in giving the shadow and not the substance. I do hope my friend Mr. Sanjivayya will take it up very strongly in the Cabinet and see that credit facilities are liberalised.* In this respect we have been urging Sri Sanjivayya and the Government of India for the establishment of a credit institution like the IDB or the IFC for Small Scale Industries. I think it is very necessary. The Small Scale Industries will not be able to take assistance from financing institutions because of the cumbersome procedures which one has to follow before he is able to get any financial assistance either from the IDB or the IFC. In fact the delay is so great that the next generation may perhaps reap the fruits of the first generation's efforts. The Small Scale Industries will not survive for the next generation if it is starved. It is therefore very necessary that we should have a credit institution and Mr. Sanjivayya will always have the weight—whatever we may have—of the Small Scale Industries Ministers of the States in the pressure that he may apply to the Finance Minister for the acceptance of this proposition.

LIFE INSURANCE CORPORATION AND RESERVE BANK

I shall mention one other point and I shall conclude. The Life Insurance Corporation of

India agreed to finance the Co-operative Small Scale Industrial Estates and they said that they will be able to lend us money at the rate of 6½%. The Madras Government on that basis encouraged a large number of people to go ahead with the establishment of Co-operative Industrial Estates and they are all half-way through. When we agreed to pay 6½% interest, the Reserve Bank stepped in and said that the Government should not guarantee any loan which carries any interest of more than 5½% and therefore, we should not borrow or we should not give guarantee or allow the co-operative Small Scale Industrial Estates to borrow at a rate anything higher than 5½%. Here are two departments of the Government of India, one the Life Insurance Corporation and the other the Reserve Bank of India. One department says 'I will give it at 6½%.' Another department says 'you should not borrow paying more than 5½% interest'. So far as I am concerned, I am willing to abide by the advice of either of them. If I am asked to pay 5½% interest, I will thank the Reserve Bank. If I am asked to pay 6½% interest, still I will thank the L.I.C. because I get money. Because of the quarrel between the two departments, I have been left penniless all these years. It is up to the Industries Minister of the Government of India to take it up and see that some settlement is arrived at the level of the Government of India. Either Co-operative Industrial Estates may borrow at 6½% from the L.I.C. with the guarantee of the State Government or the L.I.C. must be allowed to charge only 5½% interest with the guarantee of the State Government. Unless this is done, a

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large number of Industrial Estates which are half-way through will come to grief and I do not want even a single small scale unit established in any part of the Madras State, why even in India, to come to grief. I do hope that these matters will be taken by Mr. Sanjivayya and solution will be found for them soon.

The exhibition is an excellent one. It gives us a bird's eye-view of all the things that are being produced in the Small Scale Sector. In fact when I went round again this morning, I was stunned by the variety of products exhibited. I began to wonder whether we are making all these things in the Small Scale Sector. I do hope that this exhibition will encourage a large number of Small Scale Entrepreneurs to launch on Small Industries and the Government will give them every assistance, facility and guidance. I wish the exhibition which is going to be a permanent one, all success.

Address by Thiru E. C. P. Prabhakar, I.A.S.:

I am sure by now we are all familiar with the sign of the triangle, the Directorate of Industries constituting one side, the Small Industries organisation, more particularly the Small Industries Service Institute constituting the other side and the third side being covered by all associations connected with small industries. The importance of today's function is the united effort of these three in the

service of small industries movement. There is of course no need for me to elaborate on the importance of opening a permanent exhibition for small industries. But personally I am sure that it has been an experience for all of us. Though the exhibition itself has been rather hurriedly got up, yet it has brought me closer to the other two sides of the triangle and has helped to create the right type of climate which is so necessary for joint efforts and joint ventures. Looking back on the efforts for industrialisation of the country during the past three plan periods, it clearly points to the inescapable position that it is the development of small industries with geographical dispersal and structural decentralisation that will eventually prove to be the turning factor in the country's industrial and economic progress.

ALLOCATION OF RAW MATERIALS

Let us, therefore, resolve that our strategy for the Fourth Plan period will be a mammoth effort in the field of Small Industries, not a blind one but on a set pattern that would eventually have the maximum impact on the country as a whole and reflect sharply on the rate of industrial growth. I would be failing in my duty if I do not refer to the magnificent manner in which the new entrepreneurs and small industrialists faced the crucial period of the past years. It only speaks highly of the calibre of men that have entered the field of industries. In fact a new society has

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been born with men of courage, determination and foresight, not to speak of the highly praised qualities of intelligence and national spirit of progress and solidarity. The credit for the creation of such a society clearly goes in no small measure to our benign Government and the Ministers concerned who have left no stone unturned in promoting, encouraging and developing small industries. I am sure you would agree with me when I say that the industrial foundations for Madras State have been well and truly laid with the establishment of industrial estates practically in every district of the State. Such extraordinary characteristics of this new society have naturally resulted in the production of quality goods and products, samples of which will be on display at to-day's exhibition. More over, with the introduction of quality marking, testing and analysing centres even higher standard and wider coverage can be expected. Further greater strides in the development of small industries can certainly be assured with the recent pronouncements of liberalisation of imports. At the same time it would be necessary to emphasise that allocations of

raw materials should be based on capacity surveys. Such a survey has been done for non-ferrous metals for all the States. I take this opportunity to put forward a strong plea on behalf of the small industrialists that for the remaining items the capacity surveys should be conducted and completed within a given time, so that allocations in future may be automatic and based on actual data. Till then unfortunately we will have to content ourselves with adhoc allocations.

REGIONAL CENTRES

Finally in order to foster healthy relationship between the three sides of the triangle, as a first measure let us establish regional centres within the State from where the three organizations can pool together their resources of men, material and technique and be of real service to the small industries movement. In this endeavour let us dedicate ourselves and for my part the Directorate and its staff will spare no pains to achieve the goals and we look forward to reciprocative co-operation from the other two sides of the triangle.

PROSPECTS OF INDUSTRIAL ADVANCEMENT

BY THIRU E. C. P. PRABHAKAR, I. A. S.,

Despite numerous difficulties, Madras State, as we are all aware, has done extremely well in the industrial field both in physical and financial achievements during the IIIrd Plan period. However, faced as we are with the critical foreign exchange position and the loan repayment obligations, the stage has been reached for a closer introspection on hand.

In this article it is not proposed to discuss industrial Development in all its aspects. It is projected to highlight, firstly, the vital role of the Small Industries Sector as well as to elaborate on the value and need for the emergence of an indigenous technology. As for the establishment, organisation, promotion and stabilisation of Small Industries, there could be no better example for us than the Japanese Experience.

Statistics for the year 1957 reveal that 97.98 per cent of the total number of industrial establishments in Japan which include places of business and trade services (about 3½ million in number) are small and medium scale industries with a labour force of less than 300 and a capital of less than five lakhs of rupees. Out of the total shipment value for that year, the smaller enterprises (i. e. less than 300 hands) accounted for 51.72 per cent; the rest being the share of large enterprises which total about 0.4 per cent of the total number of enterprises involved. Heavy and chemical industry products manufactured on large scale are still not so competitive on the world market. Thus in Japan the smaller

industries not only have an edge over the large scale ones from the point of view of income, but occupy an over-whelming position of all enterprises in the country. This is easily traceable to the early Meiji Restoration period (1868 onwards) when the then Government was bent on catching up with advanced capitalistic countries quickly and invited foreign technicians, imported machinery and equipment for developing the steel and other heavy industries. In this process the native small industries like cast metal, ceramics, lacquer ware, fancy matting and straw plait received hardly any assistance from Government and had therefore to strive for modernisation themselves, while some others like knit goods, towels, watches, bicycles, matches, brushes, soap, shell-buttons, umbrellas and toys which were transplanted from foreign countries settled down in Japan as small industries. Meiji Restoration though responsible for giving the first real push to modern industrialisation is remembered for its unbalanced fostering of a capitalist economy whose influence is still lingering with wide disparity in monthly wages, working hours and standards of living between the large and the small scale industries. But owing to the tenacity and highly enterprising nature of the people the small and petty industries changed over from manual to machines. Then the influence of successive wars and the changed attitude of Government which took several protective and promotive action, restored the struggling sector to the status of the most

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highly modernised small scale industrial country in the world. It would be interesting to note that after the World War II when the Japanese economy had received a severe set back, it was the small industries that revived first.

Among the measures taken for the organisation of small enterprises, I find that the Small Industries Co-operative Association Law of 1949 has played a most significant role. Other measures such as check on excessive competition among smaller industries, the consultative systems for the guidance of weak co-operatives and a close Governmental supervision over large-scale enterprises and their dependent sub-contractors are all worthy of special mention. On the financial side, Government advances loans to (i) People's Finance Corporation (entirely financed by Government); (ii) The Smaller Enterprises Finance Bank (Government operated and meant for higher layers of the small industries); and (iii) The Smaller Business Credit Guarantee Corpora-

tion. These in turn finance small enterprises for which they get special concessions on taxation on their reserves to cover risks on bad loans. Local Public Institutions also invest and deposit their funds with some specific financial organs so that the latter can finance the local small enterprises. There are other important measures like reductions in Corporation Tax, Enterprise Tax, mutual retirement allowance benefits and mutual vocational training for Small Industries. From the Technical Research Fund, Government makes grants and subsidies to local public experiment and research institutions to render technical assistance to local small scale industries. Funds are also made available for trial manufacture with a view to promoting exports of small scale industrial products.

Reverting back to our own country, the mid-term appraisal of the Third Plan has raised a highly pertinent question viz. should India pursue a policy of purchasing 'technical know-how' for this industrial development?

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Opinions on this issue differ in as much as some advocate the adoption of the Japanese system of "copying" while others hold that such purchase besides the high cost sometimes involves restrictive features which may not be conducive to healthy growth.

However, the fact that rapid industrialization of the country is the right answer for economic growth cannot be disputed. But the real point at issue then is how best this can be carried out to enable all the sectors to make their maximum contribution. Large and heavy industries we must have. I have also no doubt that we should go in for them and purchase technical know-how to the extent that we can afford without falling a prey to indirect factors which may inhibit our growth in any way. This will naturally mean selective investment which our planners are certainly aware of. But experience shows that there is still a substantial untapped section of the public, and unless they are activated the overall industrial growth will not only be lop-sided but also have no impact on the nation as a whole. I refer to the middle and upper-middle class people with resources ranging from Rs. 5,000 to Rs. 1 lakh found in the districts who are anxious to enter the industrial field and channel their efforts in suitable avenues. A District Industrial Seminar is almost an inescapable step in order to unearth the vast potential which, if properly handled, would certainly play an energising role in the industrial sector.

A foreign economist, after a tour of a certain district in Madras State remarked that in India the ox-cart and Jet plane existed side by side and there was a woeful lack of indigenous technology to fill in the gap. Mr. John P. Lewis, the famous American Economist writing about India supports this view in no uncertain terms when he says, "Even within the frame work of a final demand-oriented produc-

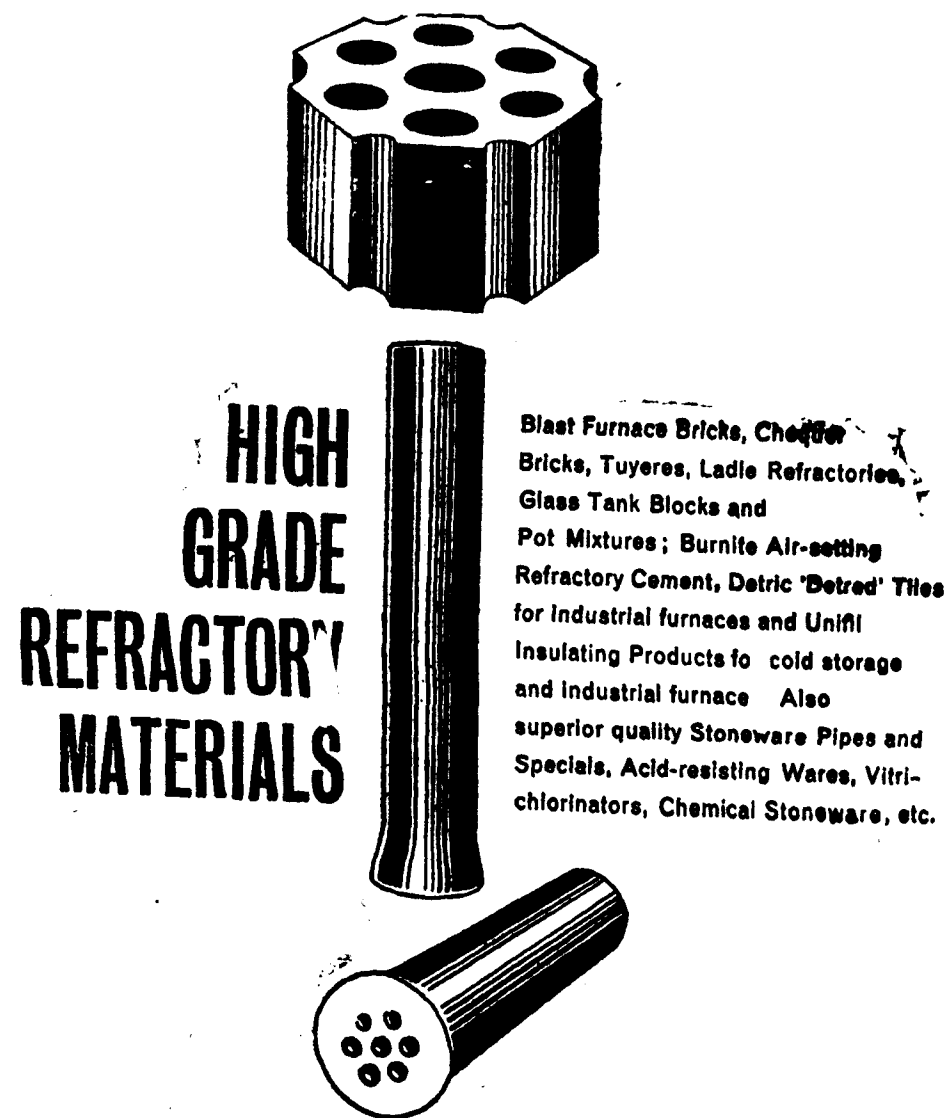
tion programme there is room for making some technologically significant product choices between close substitutes. And in many instances the modern world has evolved alternate ways of making the very same products—ways that are all drawn from the same advanced structure of scientific knowledge; but differ substantially in their relative factory requirements."

History of the progressive nations constantly reminds us of the fact that a country's standing in the economic field can be measured in terms of its technological advancement. "Technological advancement requires invention and innovation, the latter consisting of transforming new processes or new products from ideas to economic realities". Technological innovation in Japan played a significant part in the increase in farm productivity as well. Japan evolved an agricultural technology specially adapted to the physical and economic characteristics of Japanese Agriculture.

There is tremendous scope and potential in our country for evolving our own technology. It will obviously have to be directed towards developing an "intermediary technology" so that, to begin with, important commodities which are now manufactured or can be manufactured at extremely prohibitive cost (using modern Western Standards) are produced more economically with the available raw materials and within the financial resources of the entrepreneurs. The other advantages stated in short would be Capital Saving with a high labour employing potential. Small scale project investigations can include cement, organic chemicals, fertilizers, paint thinners from sugar cane juice, sulphur from gypsum and so on.

A co-ordinated effort on the part of Government Institutions and existing and prospective entrepreneurs is absolutely essential for the emergence and sustenance of a resourceful and creative indigenous technology.

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DIAMONDS FROM THE HIGH-PRESSURE PRESS

Within the space of two years, the mineralogist, Professor Neuhaus and his colleagues have managed to catch up on the twenty-year lead of international research scientists in the field of synthetic diamonds. They collaborated closely with German high-pressure and high-temperature technicians. According to what the professor said at a press conference of the State Government of North Rhine-Westphalia, which financed his expensive experiments, he is in a position today to produce diamonds with absolute certainty under rigidly defined conditions of temperature and pressure. This means that the German scientists are the first to have turned the diamond synthesis into a process, about which complete clarity exists and over which complete control can be exercised. There is no doubt that this is the most decisive step in this research field since the first concrete results were achieved in the year 1954.

Research into the artificial production of diamonds, which had been going on for centuries, reached its first climax with the revolutionary work of the American, Bridgman, in the year 1947. Bridgman received the Nobel prize for his endeavours. In 1954, the American General Electric Company and the General Swedish Electricity Company submitted tangible results in the form of the first synthetic diamonds. Soon afterwards, a large number of scientists mastered the diamond synthesis, but for the most part the outcome was based on sheer coincidence. None of the methods sufficed for producing diamonds of a worthwhile size. Even after a further eight years of research, the diamond synthesis remained a process, which was inadequately understood both technically and scientifically.

It was in the summer of the year 1962

that the wellknown mineralogist, Professor Neuhaus, who is a professor at Bonn University and simultaneously Director of the Mineralogical Petrological Institute there, began his research work with a small team of collaborators. It was thought that German research in this particular field was too far behind international science—the estimate was about two decades for decisive progress to be made. It was thus regarded as sensational all over the world, when as early as September 1964 the first successful syntheses were reported from Bonn and it was clear that the Germans had drawn level with the other scientists, who had mastered the procedures. A cylinder of pure graphite had been exposed to temperatures of 1,540° Centigrade and pressures of sixty thousand atmospheres in a tiny high-pressure chamber. The result for the Bonn scientists had been a crystal-clear, transparent, colourless diamond in the form of an exact cube.

During the past year, the German research group managed to develop its method of diamond synthesis to such an extent that it would now be possible to exploit the results of the experimentation in industrial production. According to Professor Neuhaus, if complete control is exercised over the outer form and temperatures of up to 1,600° Centigrade are utilised as well as pressures of up to 70,000 atmospheres, even larger diamonds could be produced. The price for synthetic diamonds still remains higher than that for the natural stones but industrial production on a large scale is likely to change the situation in the very near future. The new method is expected by the experts to take on great significance, because the economy is urgently in need of inexpensive industrial diamonds.

MANIPULATORS FOR USE IN NUCLEAR REACTORS

Master slave manipulators in use in nuclear reactors are for the first time to be supplied by indigenous sources to the Indian Atomic Energy Commission. A unit in the Guindy Industrial Estate near Madras has started production of this equipment.

The function of the manipulator is to do tasks in a hostile environment such as the highly radio-active interior of an atomic reactor or a hot cell of a radiological laboratory. It is operated remotely and all the movements, straightline, rotational and tong, are duplicated at the inner end by means of a system of levers, pulleys and gears. In other words, the operator achieves a mental transference that makes the duplicating end of the equipment an extension of himself. The import content, confined only to stainless steel tape and bearings is less than ten per cent in the Guindy made manipulators.

The company (Messrs. M. Krishnaswamy & Company) which received assistance from the

Trombay Atomic Energy Establishment in setting up production, has turned out one manipulator which has already been despatched to Trombay. The second unit will be ready shortly. Bulk orders are expected to be placed soon by the Commission with the company. The manipulator has been built according to the drawing furnished by the Atomic Energy Establishment as modified by the company.

Mr. H. N. Sethna, Director of the Atomic Energy Establishment, Mr. Brahm Prakash, Director, Metallurgy Division and Mr. Mecconi of the Reactor Division recently visited the unit and inspected the equipment when they were in the City.

The company is confident it can now develop other items needed in radio-active engineering like handlers, tools, tongs, special types of cameras, etc.

TARIFF PREFERENCE BY AUSTRALIA FOR INDIAN HANDICRAFTS

Government of Australia has sanctioned a scheme under which preferential duty free treatment will be accorded to handicrafts imported into Australia from less developed countries like India. That is to say a handicrafts product of India will be allowed duty free entry but a similar article of an industrialised country like U. S. A. or Japan will be subject to duty as provided in the Australian Customs Tariff. A copy of the handicraft items in the preference list is given below.

2. For the purpose of administering the scheme, the Australian customs authority should be in a position to identify the handicrafts products imported from India and other

less developed countries. In this connection it has been agreed that such identification will be made on the basis of certificates given by competent organisation in the exporting less developed countries to the effect that the products covered by the certificate are handmade products of cottage industries of the particular country concerned.

3. Accordingly it has been decided to authorise organisation as in the list attached in the different regions to grant the required certificate in respect of each consignment of handicraft product exported to Australia as well as to the other country. A specimen copy form of the certificate is given:

OFFICE OF..... PLACE.....

Certificate for Handicrafts Products of Cottage Industries of India, exported to Australia for duty free entry into Australia under the Preference Scheme.

Name and Address of Exporter from India	Name and Address of Importer in Australia	Description of Handicrafts	Quantity	Name of the vessels by which shipped	Port of Shipment.	Designation (Port of entry in Australia)
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This is to certify that the shipment described above includes only handicrafts products of cottage industry; that the handicrafts are of Indian manufacture and are exported from India for importation into Australia.

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20, Oliver Road, Madras-4.
- 3 The Weavers' Service Centre,
All India Handloom Board, 20, Railway Road, Kancheepuram.
- 4 The Handloom Export Promotion Council, 123, Mount Road, Madras-6.

LIST OF HANDICRAFTS ITEMS, ALLOWED DUTY FREE ENTRY INTO AUSTRALIA
UNDER THE TARIFF PREFERENCE TO LESS DEVELOPED COUNTRIES SCHEME

- | | |
|---|---|
| 1. Hornware, ivoryware, shellware or stoneware, being wares that are carved or inlaid. | 5. Papier mache ware, decorated. |
| 2. Lacquer ware. | 6. Pottery, decorated. |
| 3. Leatherware, decorated. | 7. Textile fabrics of cotton or in chief part by weight of cotton, weighing less than 6 ounces per square yard, not being fabrics to which sub-paragraph 55-09-329 applies. |
| 4. Metalware that is—
Beaten;
Carved;
Chased;
Enamelled
Inlaid; or
Moulded. | 8. Textile fabrics, or silk of in chief part by weight of silk not printed. |
| | 9. Wood work, carved or inlaid. |

SMALL INDUSTRY SCHEME

MANUFACTURE OF CARD BOARD BOXES

INTRODUCTION

Card board box is a necessity of every-day modern life and is a most suitable packing material. The demand for this item is ever-growing as a consequence of the industrial growth of the country. There is no special technique involved in the manufacture of card board boxes and many a social industrial centres have undertaken the manufacture even on a cottage basis. Since the box occupies more volume than a card board from which it is made the box is never manufactured at a big factory and transported to the places where it is consumed. Thus card board boxes are manufactured only by small units at places where there is immediate demand. The manufacture of this item offers an ideal field for employment of women and a good number of Women's Welfare Centres have taken up this line e.g., Ghraha Udyog Sahakari Mandal Ltd., Bombay, is running four centres in and around Bombay and have found useful employment for 25 to 30 women workers for the manufacture of card board boxes at each of these centres.

Though the boxes can be made by stitching or only by pasting, the present scheme shows the details of making card board boxes by pasting paper. However, the machinery provided in this scheme, meets the machinery requirements for stitching the boxes and carton making also. The boxes are required for variety of uses and vary considerably in size. For the present scheme the card boxes (size 10" x 7½" x 1½") are taken into account. This scheme envisages the employment of about 50 women workers.

RAW MATERIALS

No.	Materials
1.	1" Straw Board or grey board
2.	White printing paper
3.	Rough paper for lining
4.	Border paper (Blue)
5.	Starch (for making glue)

PROCESS

The card board is cut to size, scored. The corners are then cut, the bends taken and paper is pasted as lining and for the exterior. Decoration in the form of coloured border is offered at the seams.

ESTIMATE OF MANUFACTURING PLANTS

(i) *Machinery and Equipment:*

Item	Equipment	No.	Cost
1.	Scoring and cutting machine ...	2	16,000
2.	Corner cutting and slotting machine (hand operated) ...	2	600
3.	Bending machine (for carton)...	1	6,500
4.	Stitching machine ...	1	2,000
5.	Guillotine (hand operated) ...	1	1,000
6.	Miscellaneous charges including installation ...		1,900
			28,000

(ii) *Raw Materials:* For manufacturing 1,35,000 boxes per month.

Basis: (i) 50 women workers.

(ii) Production of 5,400 boxes per day (size 10" x 7½" x 1½")

or

1,35,000 boxes (size 10" x 7½" x 1½") per month.

Material	Qty.	Rate	Cost per month	Cost per annum
1. Straw board or Grey board 25" x 30" ... 250 cwt. 30 cwt.			7,500	90,000
2. Lining paper (640 sheets for top and 560 for sides (size 30" x 40") ... 62.5 Rms 35/Rm			2,250	27,000
3. Bottom (lining paper 30" x 40") ... 32.5 " 24/Rm			800	9,500
4. Border paper (blue) (13" x 16") ... 70 " 18/Rm			1,260	15,120
5. Starch(2.5cwt.) 30/cwt.			75	900
			13,822	1,59,870
			Say Rs. 1,60,000	

Over and above this, a stock of Raw material for three months will be needed.

To the cost of 3 months raw material Rs. 39,966
Say 40,000

(iii) Wages: Of skilled and unskilled workers per month:

Item	Post	No. of men	Pay/ month Rs.
1. Manager		1	250
2. Skilled workers (@ 3 per day)		4	800
3. Women workers (@ 2 per day)		50	2,500
4. Clerk-cum-Accountant		1	150
5. Office boy-cum-peon		1	80
6. Watchman		1	70
		Total	3,850

(iv) Other items of expenditure per month:

No.	Items of expenditure	Cost
1.	To cost of Factory Rent 80' x 40' ...	150
2.	" Electricity ...	25
3.	" Insurance on plant and stock @ 1% on Rs. 68,000.	57
4.	" Advertisement, Stationery and sundry office expenditure etc. ...	168
		400

(v) Working capital:

It will be necessary to have working capital for 3 months which will be as follows:—

To cost of 3 months raw materials	Rs.
(Head 2) ...	40,000
" 3 months wages (Head 3)	10,050
" 3 months other expenses (Head 4) ...	1,200
Total ...	51,250

(vi) Manufacturing cost of 1,35,000 boxes per month:

Item No.	Details of expenditure	Amount Rs.
1.	To cost of Raw materials (Head 2).	13,322
2.	" Wages (Head 3) ...	3,350
3.	" Other items (Head 4)...	400
4.	To interest charges on working capital @ 6% per annum, per month on Rs. 48,850 ...	244
5.	To interest and depreciation charges on capital investment on machinery at 16% per annum per month on Rs. 28,000 ...	373
		17,689
		or say 17,690

To cost of manufacture of 16,20,000 boxes per annum ... Rs. 2,12,280

(vii) Profit & Loss:

(a) To returns per annum from the sales of 16,20,000 boxes @ Rs. 13.50 per 100 ... 2,18,700

To total cost of manufacture of 16,20,000 boxes per annum ... 2,12,290

Profit per annum 6,410

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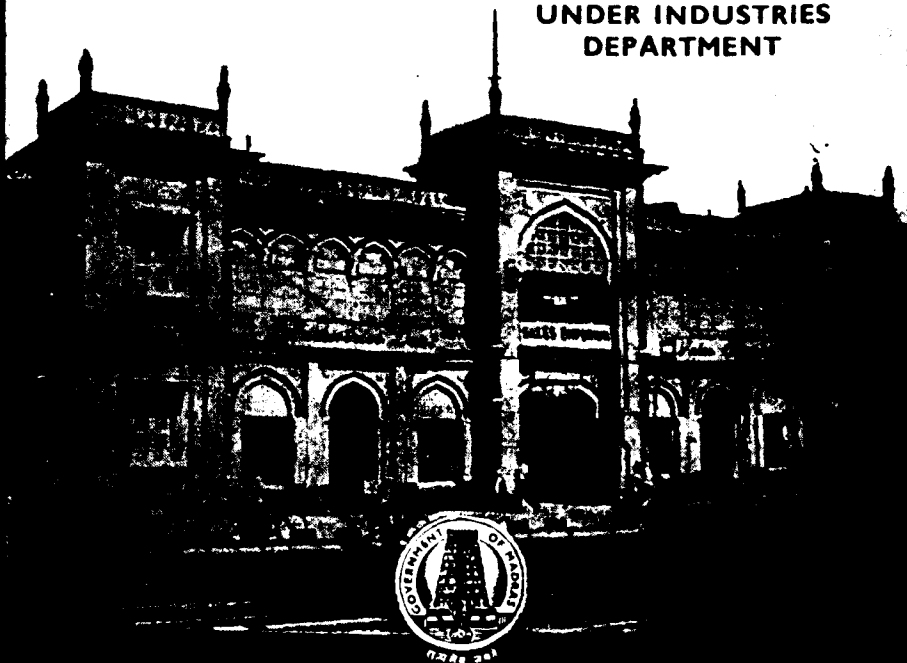
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