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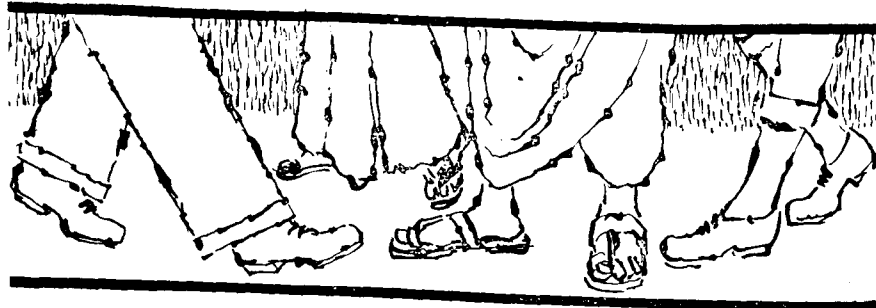
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IN THIS ISSUE

	PAGES
INDIA'S FIRST FUNCTIONAL ESTATE SET UP IN MADRAS	
TALKING ABOUT TOYS AND DOLLS..	
THE PRODUCTION OF PARTICLE BOARD FROM COCONUT HUSK	1-5
MANUFACTURE OF LEATHER BOARDS	11-23
WHAT SMALL INDUSTRIES CAN YOU START?	29-42
MANUFACTURE OF FLUORESCENT TUBES AND POWER DRIVEN PUMPS	47
LICENCES UNDER THE INDUSTRIES (DEVELOPMENT AND REGULATION) ACT 1951...	51-53
INSULATING PRODUCTS AND OTHER ARTICLES USING ASBESTOS-MAGNESIA ...	59
ELECTRICITY FROM NATURAL GAS TURBINE	61-62
ON SOME POSSIBLE MINERAL BASED INDUSTRIES IN THE MADRAS STATE ...	63-69

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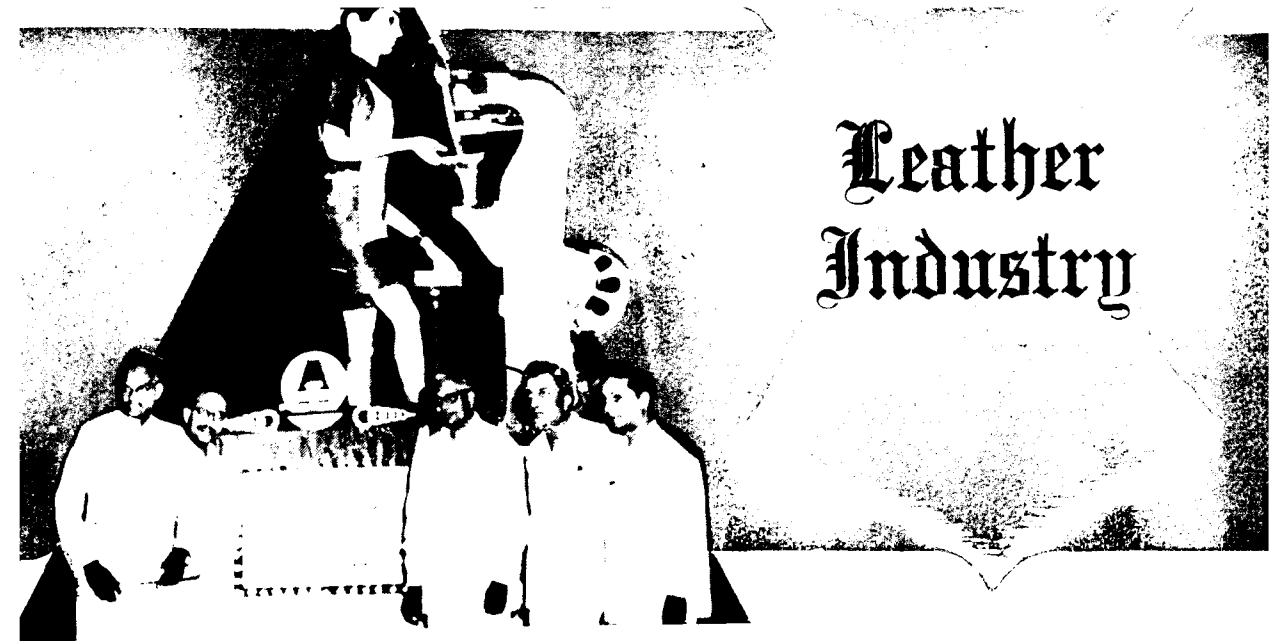
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An impressive model depicting the modern leather worker on machine erected at the entrance to the Madhavaram Estate.

INDIA'S FIRST FUNCTIONAL ESTATE SET UP IN MADRAS

**PROVIDES COMMON SERVICE FACILITIES, RESEARCH CENTRE AND
QUALITY CONTROL SCHEME**

SRI R. VENKATARAMAN,
Minister for Industries,
inaugurated the Estate by
sliding the zip fastener of
a leather bag which
opened the screen and
illuminated the Estate.





Home address by
S. Balakrishnan,
Minister of Industries &
Commerce



The Minister
Industries, Mr.
Balakrishnan, at
Madhavaram the
inaugural address

THE first Functional Industrial Estate of the country for the manufacture of leather goods has now been established at Madhavaram in the vicinity of the city, and Madras has once again taken the pride of place in leading the rest of the country entirely in a new direction. Unlike the normal Industrial Estate with which one is familiar and which provides accommodation to a wide variety and range of small scale industries, the Functional Estate at Madhavaram is devoted to one particular industry and trade—the manufacture of leather goods. It was commissioned on 2nd July, 1964 by Sri R. Venkataraman, Minister for Industries, who hailed the estate as a forerunner of many more such estates to be set up in Madras State. Sri T.A.S. Balakrishnan, Director of Industries and Commerce, welcoming the Minister on the occasion, said that the estate had become very popular right at the start itself and the demand for units was high. The Director of Industries also informed that a Functional Estate for ceramic industry was being established at Vridhachalam.

THE WHAT AND WHY OF THE ESTATE

Inaugurating the estate, the Minister stated that the leather industry was an important foreign exchange earner and out of the total of Rs. 27 crores earned by the whole country, Madras State alone accounted for its lion-share of 75 per cent. but on account of certain handicaps like the lack of proper servicing facilities, technical know-how, modern manufacturing methods etc., the industry had been experiencing a setback and it was not able to send finished goods. The Minister expressed the hope that the provision of the aforesaid

facilities besides the establishment of a Research Centre and Quality Control Scheme would go a long way to meet the long-felt needs of the industry and give a fillip to the finished leather industry. He added that the new estate would bring together the expertise of the various manufacturers, and the leather industry would grow and reach a stage when quality goods needed both for home consumption and export market would be available in plenty.

THE ESTATE AND ITS FEATURES

The Madhavaram Estate has come up on a 32-acre site at a cost of Rs. 14 lakhs for the first stage and out of the 21 units envisaged for the present, 14 have already been constructed and all allotted to the small scale leather industrialists. A Common Service Centre has been set up at a cost of Rs. 5 lakhs by the Industries Department. The factories, when in full swing, will have an employment potential for about 1,000 persons and the annual production by the various units is expected to be the order of Rs. 30 to 40 lakhs

worth of leather goods, a good percentage of which might be available for export. The products to be manufactured in the estate will cover a wide range like purses, footwear, handbags, document and suitcases.

LOW CONSTRUCTION COST

Sri T.A.S. Balakrishnan, Director of Industries, at the outset said that though a new line of development in industry, the Madhavaram Estate was not costly. Sri P. Sivalingam, Superintending Engineer, Construction Branch, outlined the salient construction features of the estate and said that the cost per square-foot of plinth area worked out to Rs. 14-80 P. which should be considered fairly cheap.

Sri P. Sabanayagam, Chief Controller of Imports and Exports, Sri T. N. Lakshminarayanan, Secretary to Government Industries, Labour and Co-operation Department and Sri A. Nagappa, Vice-President of the Export Promotion Council for Leather, were present on the occasion. Sri B. S. Ambally, Footwear Expert attached to the Industries Department proposed the vote of thanks.

REVIEW OF THE CITY EXHIBITION

The Madras Dolls and Toys Exhibition organised by the Department of Industries and Commerce and conducted at Rajaji Hall mid-June this year was unique in many respects. While one could notice a lot of excitement generated among the kiddies about that glamorous show ever witnessed in the city, it was an event of outstanding importance for the designers, artists and craftsmen. It was also of the nature of a bracing tonic for the home manufacturing industry.

Declaring open the exhibition, Sri R. Venkataraman, Minister for Industries, complimented the Director of Industries for having organised it and said that toys are designed not only to entertain but also to benefit the children to improve their general knowledge. The Minister stressed the need to produce novel toys like the battery operated ones as are manufactured in the advanced countries abroad like United States of America and elsewhere.

The exhibition was arranged with a view to focus the attention of the public, the craftsman, the dealer and the exporter on the existing possibilities of the Madras toys and dolls. While those made by the craftsmen in the villages to meet the local needs are generally found to be quite appropriate both functionally and artistically, the production ordered by middlemen according to specification and designs considered desirable by them for the markets in towns has often led to unhappy results owing to evolution of hybrid forms distasteful to a cultured population. That is how one could talk endlessly about toys as they become more and more sophisticated. Therefore, a Design Demonstration Centre with competent trained staff has been set up to provide the necessary guidance for designs to suit modern trend and taste. A Japanese

Top:

A toy (Chinese Model)
with exciting modern outfit

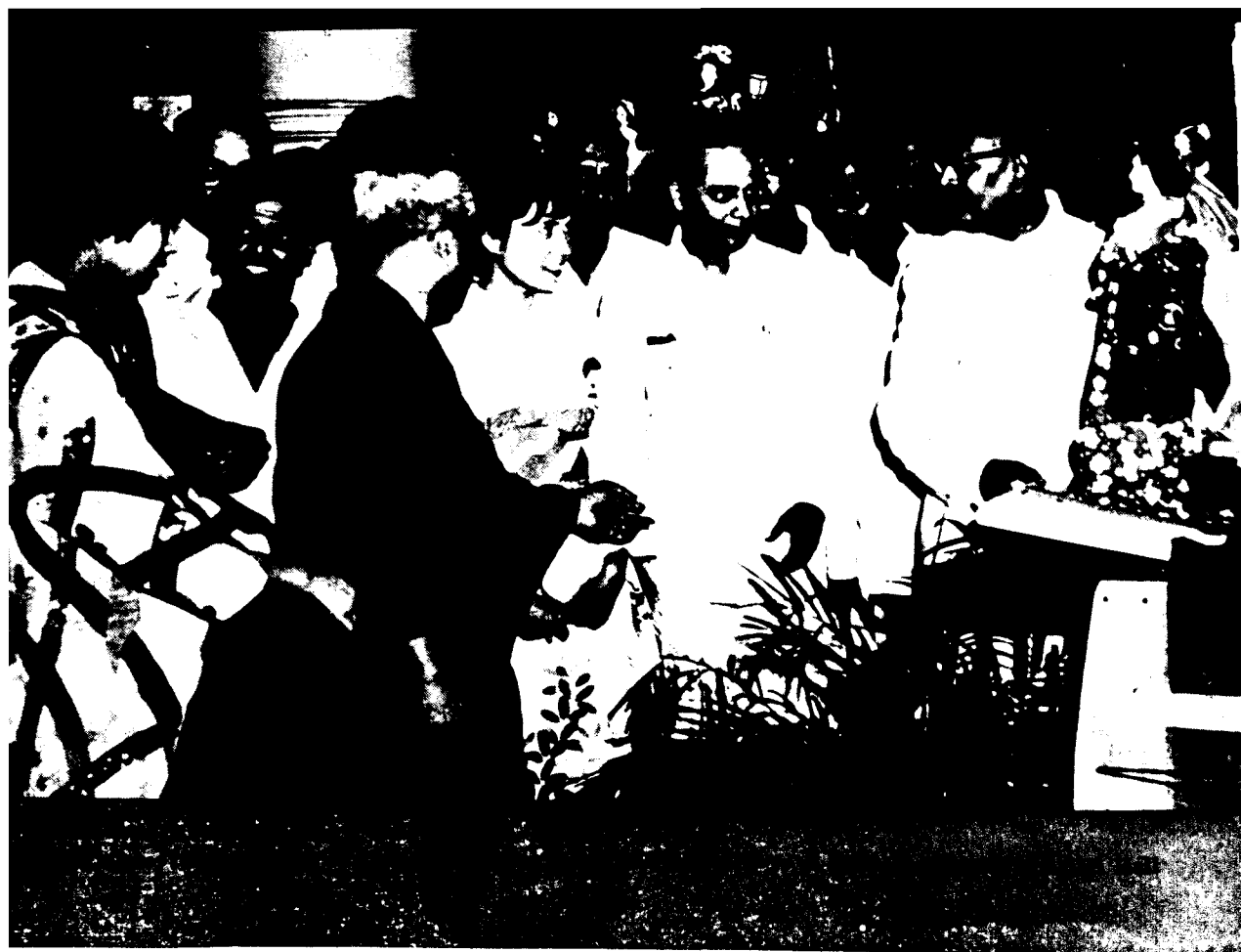
Centre:

A type absorbing and
plunging children to wonder

Bottom:

Little kids are unable to resist the
fascination of this village scene





Expert has also been engaged to assist the trainees of this centre which is functioning under the auspices of the State Industries Department.

Made out of a variety of materials like cloth, clay, paper, pith, leather, wood, metal and stone, the traditional South Indian Toys are not only playworthy but are also designed to increase awareness of child development and psychology. They are more real and more authentic. Accurate true-to-life details are embedded in them. In Madras we have realistic types of toys and dolls like life-like models of birds, animals and vegetables, occupational toys depicting with imagination and sometimes humour the work and life of the people, their modes and customs. toys for ceremonial occasions illustrating mythological episodes, romances, beliefs, etc. There are also decorative



Top:

**A new line !
New style !!
And entirely a new pitch !!!**

Right :

A light decorative model made of pith



Mr. S. S. Srinivasan, the Director of Industries are seen with the Japanese expert Mr. Kawashima and his daughter Mrs. Yoshiko Kawashima who are assisting the trainees of the Madras Toy Centre in their work under the auspices of the Department of Industries and Commerce.

types of toys that come under the category of artistic toys providing full scope for the imagination of the artist-craftsman and in some cases they reach a high degree of artistic expression.

The dominant factors in our toys to-day are quality, safety, character-development and realism, and toy industry in Madras State has made giant strides in all of them.

With a new enquiring outlook of children everywhere, modern toys are more instructional. They make demands on kiddies' mental

and manual dexterity. Construction-kits, home painting and modelling, replicas of modern machinery and domestic appliances—these are some of the things that have made toys not just amusements, but a means of enhancing a child's inherent talents. Even baby toys should reflect this new outlook. They should be designed to awake thinking process helping babies to think in colours, pattern and sequences and to reason logically. Generally speaking, toys for all the age-groups should be so designed as to promote mental and manual adroitness and help develop character.

It is, of course, quite impossible to mention everything that was on show, but the representative collection included a comprehensive range of daintest, cutest and smartest dolls and toys designed and made by the Madras Toys Design Centre. Brilliant models with tremendous play and educational value have been evolved and those outstanding models made watchers hold their breath. The nativity models were true to life ones.

For bulk purchase and trade terms the following may be contacted :

- (1) Cottage Industries Sales Emporium,
Mount Road, Madras-2.
- (2) Madras State Handicrafts Co-operative
Marketing Society,
389, Thambu Chetty Street,
Madras-1.
- (3) Assistant Director of Industries &
Commerce (Marketing),
Department of Industries & Commerce,
Madras-2.

Top :

An attractive pull-along,
elephant nursery toy

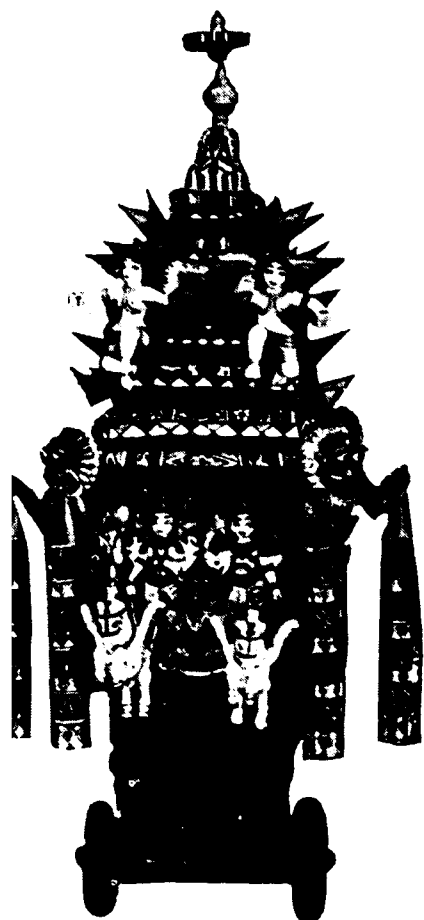
Centre :

A Chinese model with
captivating hair-style

Bottom :

A decorated toy horse
made of pith





Left:

A pleasant blend of art and elegance



Bottom:

A brilliantly original model quickly seized upon by the prowling press photographers



IN MEMORY OF
PANDIT JAWAHARLAL NEHRU
PRIME MINISTER OF INDIA

14-11-1889 : : 27-5-1964.

THE PRODUCTION OF PARTICLE BOARD FROM COCONUT HUSK

(BY JOSEPH GEORGE)

Central Building Research Institute, Roorkee

Particle boards are composed of distinct particles of wood or other fibrous material which are bonded together with a synthetic resin. Production of these boards is expanding rapidly in many countries. A wide variety of raw materials and particles of varying shape and size may be used in their manufacture. The capital investment required to establish a plant for the manufacture of particle board is considerably less than for insulation board and hardboard.

OUTLINE OF THE PROCESS

The main operations in the production of particle board are briefly described below and a schematic outline is given in Figure 1.

1. *Particle preparation*: The wood or other raw material is converted into splinters 0.004 in. to 0.118 in. (0.1 mm to 3.0 mm) thick by hammer mills, or into flakes or shreds 0.008 in. to 0.016 in. (0.2 to 0.4 mm) thick, 0.4 in. to 2.4 in. (10.0 to 60.0 mm) long and 0.118 in. to 1.18 in. (3.0 to 30.0 mm) wide, by specially designed cutter-type machines. The properties of the final product are largely dependent on the type of particles used. Cutter-type or "engineered" particles give boards of higher strength than hammer-mill type particles. In general, it may also be stated that the length and thickness of the particles are important for maximum strength of the boards but width is relatively unimportant.

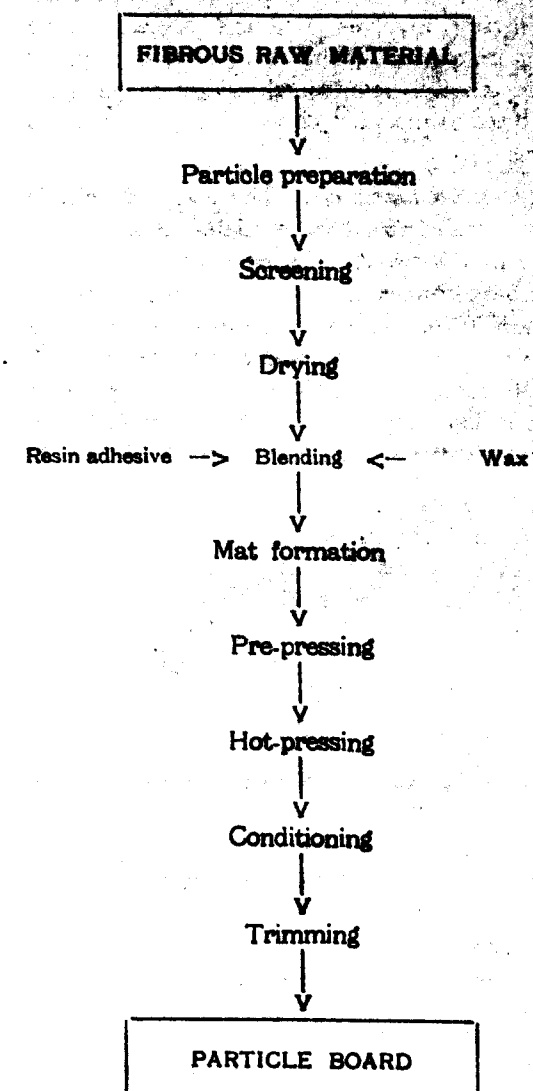


Fig. 1: Schematic outline of main operations in particle board manufacture by the batch process in a flat-platen press.

The particles should be such that they do not interlock into bundles, but are of a free-flowing nature. This will facilitate subsequent operations and ensure uniformity of the final product.

2. *Screening*: The particles are screened to remove fines and particles of undesired shape which, if allowed to remain, would present segregation problems during manufacture.

3. *Drying*: As particle board production essentially involves a gluing operation, the moisture content of the raw material requires to be carefully controlled. Usually, particles are dried to moisture content ranging from 5 to 12 per cent.

4. *Resin blending*: The resin adhesive is next applied to the particles effecting as uniform a distribution as possible. Resin cost is a very important factor in particle board manufacture. The quantity usually employed is 6 to 9 per cent (by weight of the board). A small proportion (0.3 to 1 per cent) of paraffin wax is also usually applied to the particles to increase water resistance.

5. *Formation*: The resin coated particles are formed into mats for pressing. This may be a batch process or a continuous process. In the batch process, a caul (usually a metal sheet) or a tray is used on which may be placed a frame known as the deckle frame. A pre-determined amount of particles is introduced and distributed uniformly within the frame.

6. *Pre-pressing*: The mat formed in the above operation is frequently pre-pressed at room temperature, prior to entering the hot press. Pre-pressing makes the mat more solid and facilitates handling. It also reduces the thickness of the mat and, therefore, the daylight openings of the hot press.

7. *Hot pressing*: The mats are transferred to the hot press by means of suitable loading

devices. Mats formed by the batch process are pressed in flat-platen multi-opening presses with up to 20 openings. The temperature employed depends on the type of resin adhesive and usually ranges from 100°C to 140°C. Pressing cycles will vary with the thickness of the board, the temperature and other factors. For a $\frac{3}{4}$ in (1.9 cm) board, it may range from 8 to 30 minutes. A seven opening 8 x 4 ft. press operating on a 30 minute cycle will have a capacity of 3584 sq. ft. per 8 hour shift.

In the continuous mat formation process, the pressing is also continuous. This may take the form of flat-pressing, or both formation and pressing may be combined into an extrusion operation.

8. *Conditioning*: It may be necessary to condition the boards to equalize the moisture content throughout them and thus reduce warpage that might otherwise occur. It may be carried out in a conditioning chamber or by face to face stacking for a suitable length of time.

9. *Trimming*: After the boards leave the press or the conditioning chamber, they are trimmed to the required size.

MACHINERY AND EQUIPMENT

As may be noted from the above description, the machinery and equipment required for particle board manufacture by the batch process are:

- (a) Chipper to prepare particles,
- (b) Screening device,
- (c) Dryer,
- (d) Resin blender,
- (e) Mat forming arrangement
- (f) Pre-press
- (g) Hot press
- (h) Loading and unloading device for hot press
- (i) Conditioning chamber, and
- (j) Trim saws.

Equipment for transportation and storing may be required depending on the size of the plant and cost of labour.

COCONUT HUSK AS A RAW MATERIAL FOR PARTICLE BOARD

Particle board prepared from wood, bagasse, etc., require the normal proportion of adhesive (6 to 9 per cent by weight) for bonding the particles. But coconut husk is unique in that it has considerable self-bonding property. Experiments have shown that satisfactory boards can be prepared from the husk of mature coconuts using only 0.5 per cent adhesive 1, 2. This can result in greatly reduced cost of production of particle boards. Other inherent advantages of boards from husks are resistance to fire and decay (Figure 2).



Figure 2

Burning test for fire resistance. The flame does not spread on coconut husk board (right) while board from wood burns freely (left).

The annual production of coconuts in India is over 8,000 million nuts, but the husks of only 1,500 million nuts are used for making coir. The husks of the remaining 1,500 million nuts, which would weigh over 1,000 million pounds or 446,000 tons in the dry condition, do not find any industrial use at present.

Coconut husks suitable for coir making are systematically collected from the coconut growing areas of Kerala and brought to the retting areas. The same system of collection could be used to collect husks for making boards. Even if only 10 per cent of the industrially unused husks is collected, the quantity would be about 44,600 tons, sufficient to manufacture 40 million sq. ft. (3.7 million sq. m.) of boards of $\frac{3}{4}$ in. (1.9 cm) thickness having a density of 40 lb/cu. ft (640 kg/cu. m).

Boards up to 14 sq. ft. (1.3 sq. m.) in area have been prepared from the unretted dry husks of mature coconuts in the laboratory following the procedure described earlier. The different stages in the preparation of the board are shown in Figure 3.

The husks were cut into short lengths of 1.5 to 2 in. (3.8 to 5.0 cm) and the pieces were beaten by a wooden mallet and shredded by hand into fibre bundles of the thickness of match sticks. Most of the pith present in the husk remained attached to the particles during this process. The particles which did not require further drying, were coated with 0.5 per cent phenolformaldehyde resin, formed into mats and pressed at 150°C at about 150 lbs./sq. in (10.5 kg/cm²) for 30 min. for $\frac{3}{4}$ in. thick boards. It was observed that the moisture content of the particles at the time of pressing was not very critical. Three-layer boards having coconut husk particles for core and wood flakes for faces were also prepared³. Such boards have excellent strength and considerable resistance to fire.



Figure 3

Different stages in the preparation of particle board from coconut husk. The husks (foreground left) are cut into short lengths (middle) and converted into chips (right) before being consolidated into a board (background).

Urea-formaldehyde resin adhesive has also been found suitable for coconut husk particle board preparation. It may be emphasized that before starting the manufacture of particle boards from coconut husk, some further work requires to be done, especially in developing a suitable chipping machine. Industrial wood chippers are not likely to prove satisfactory for the husks because of the toughness of the coir

fibre. The large scale chipping of the husks can probably be carried out in two stages as follows:

- (1) Cutting the husks into pieces 1-5 to 2 in. long
- (2) Conversion of the pieces into thin flakes. In designing machines for this it should be borne in mind that the particles produced should be of a free-flowing nature and the separation of pith from fibre should be kept at a minimum. It would seem, therefore, that all tearing action should be avoided and clean cuts ensured.

ECONOMIC CONSIDERATION

An attempt has been made below to draw up an estimate for a small plant to produce 12 tons per day of $\frac{3}{4}$ in. thick boards of 40 lb/cu. ft. density. The source of much of the data is the technical papers submitted to the International Consultation on Insulation Board, Hardboard and Particle Board, Geneva, (1957)'.

The price of coconut husk delivered at a board mill is not easily determined at present. Since dry husks have no industrial use, it would be reasonable to assume a price equal to that of firewood.

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Working Capital (3 months cost of production excluding depreciation)	...	167,300
TOTAL		1,042,300

COST OF PRODUCTION OF ONE TON $\frac{3}{4}$ in. THICK, 8 ft. x 4 ft. BOARD OF 40 lb/cu. ft.

DENSITY

Capacity	...	12 tons per day in 3 shifts
Working days per year	...	300
Resin adhesive on board	...	0.5 per cent

Raw materials:		Rs.
Coconut husk, 1.2 tons (Rs. 44.80 per ton)	...	53.76
P. F. resin, 12.32 lb. (Rs. 3.00 per lb)	...	36.96

Conversion costs:		
Wages	...	32.00
Power, 200 KW	...	20.00
Steam, 2 tons	...	24.00
Repairs, maintenance, depreciation, establishment, contingency, etc.	...	54.11

Return on capital	...	27.45
Total ex works price per ton	...	243.28

This price is equal to Rs. 27.71 per 100 sq.ft. (Rs. 2.98 per sq.m.). The corresponding figure for a board prepared with the conventional quantity of resin (say, 8 per cent U.F. resin) would be Rs. 63.10 per 100 sq.ft. (Rs. 6.79 per sq.m.).

It must be emphasized that these cost estimates are only approximations. Nevertheless they show that particle board from coconut husk should cost much less than the usual type of board.

ACKNOWLEDGEMENT

The author is grateful to Shri R. P. Brahma and Shri V. V. Sasidaran for the cost calculations. This scheme is published with the permission of the Director, Central Building Research Institute, Roorkee.

REFERENCES

1. George, Joseph and H. C. Joshi, 'Indian Coconut Journal, 12 (2), 46 (1959).
2. George, Joseph and M. M. Shirsalkar, 'Research and Industry, 8, 129 (1963).
3. George, Joseph and J. S. Bist, 'Indian Pulp and Paper', 16, 437 (1962).
4. F. A. O. International Consultation on Insulation Board, Hardboard and Particle Board (Geneva, 1957) Rome, 1958.

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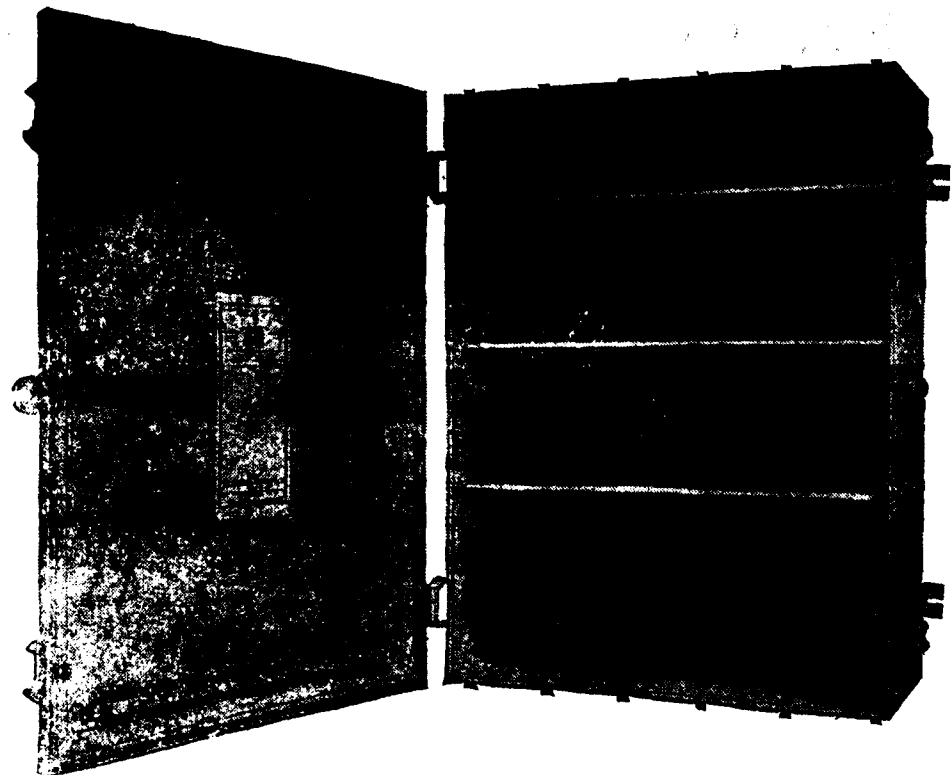
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Extract No. 1

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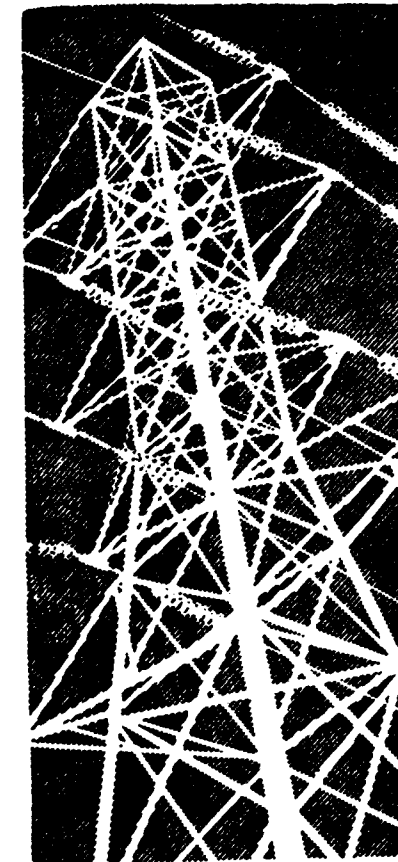
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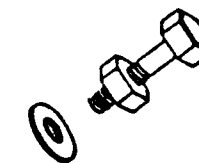
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MANUFACTURE OF LEATHER BOARDS

TECHNICAL NOTE BY THE CENTRAL LEATHER RESEARCH INSTITUTE

Leather boards are widely used in footwear industry as insoles, midsoles, stiffeners, heel lifts and in making utility goods like camera cases, purses, valets etc., flooring, packing and furnishing purposes etc. The main raw materials in the manufacture of leather boards are the waste leather shavings, trimmings, cuttings and leather scraps from tannery, shoe or leather goods factory. Generally leather boards contain only tanned leather fibres but other compatible cellulosic fibres like jute, or, paper could be conveniently incorporated along with the leather pulp to some extent in the manufacture keeping in view the resulting use for the boards.

A technical note conducted at this Institute to make leather boards from indigenous materials and chemicals and based on pilot plant scale over a considerable period is given below. A qualitative flow-sheet is appended at the end together with pre-construction cost estimation for $\frac{1}{2}$, 1 and $2\frac{1}{2}$ tons a day plant. In view of the availability of vegetable tanned leather wastes in larger amounts, in the country the process of manufacture described below is in respect of the utilization of this waste for the leather board. But the equipment is general to deal with all types of leather wastes.

PROCESS OF MANUFACTURE

The leather scraps are first mechanically cut to uniform small pieces (10-15 mm) square or round pieces by using a rotary knife cutter like the Condux cutter. In case the leather waste pieces are not of large sizes they could be also ground to powder in a rotary knife cutting machine like the wiley mill using the proper sieves to give fibre length of 10-15 mm. length.

After dry grinding, the cut pieces are weighed and soaked in water (solids content 5%) with 1% soda ash and 0.05% wetting agent like Sodium Lauryl Sulphate in cement vats or wooden tubs. A 24-hour soaking period is generally given in the case of vegetable tanned kips and sole leather pieces. The well soaked small cuttings are next defibred in Condux toothed disc mills having rotating and stationary discs made of manganese steel alloy in three distinct passages, the first being with coarsely toothed discs, second with fine grinding sheaves and the third with refining burrs made of corborundum, in three separate mills, the flow from one mill to the other being effected by gravity. A knot free pulp is obtained by adopting the above wet grinding process. The pulp is further beaten in a Hollander Beater (similar to one in paper factory) to get a thoroughly defibred pulp and washed. This Hollander may also be used for making rag pulp or jute pulp which, if desired, may be incorporated with leather pulp.

APRIL—JUNE 1964

Calculated amount of water is added to the pulp in the Hollander Mixer so that the concentration of slurry is maintained between 3 and 3.5%. The Hollander starts beating and the stock is kept under agitation while the following reagents with their functions specified against each, are added to the pulp one after the other at intervals noted below :

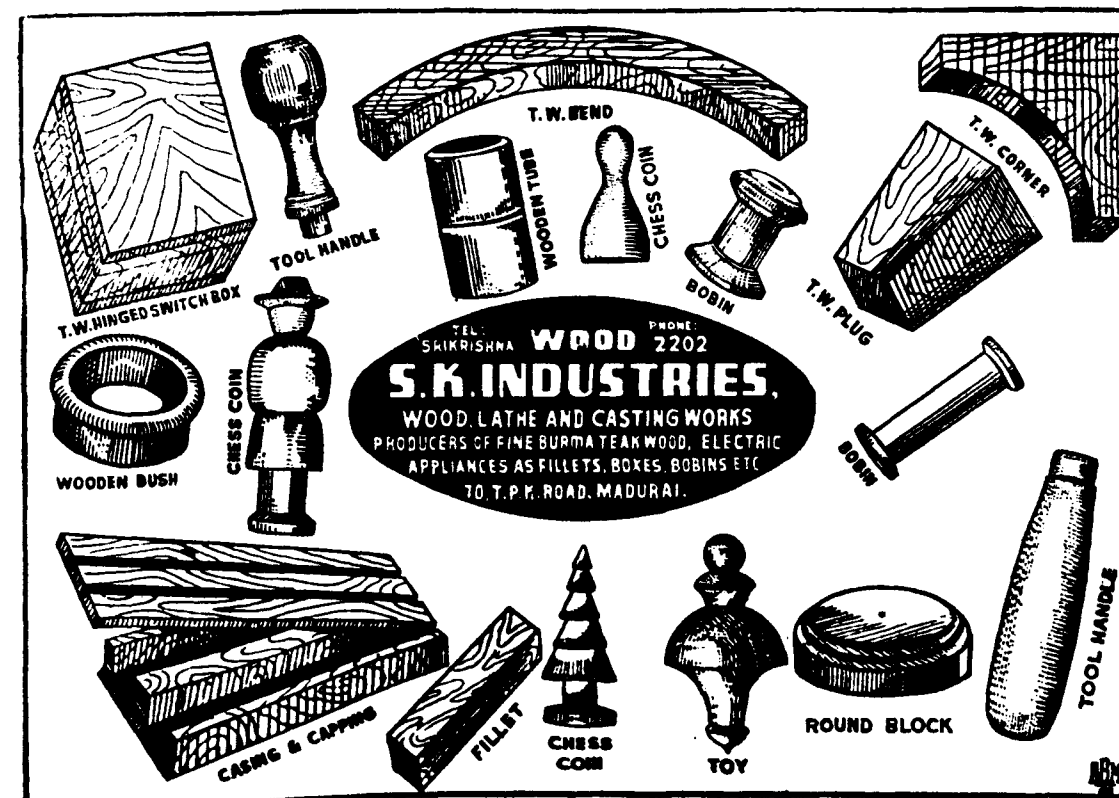
Reagents	Functions	Quantity (% on leather)	Interval	Remark
Sodium lauryl sulphate ...	Wetting agent	0.05%	5 mts.	—
Basic dyes ...	Colouring agent (Orange & Yellow)	0.1 %	10 mts.	—
Sulphated pungam oil ...	Plasticising agent	5 %	15 mts.	Any other sulphated oil like castor could also be used.
Rubber latex (60% solids) ...	Binder	40 %	45 mts. } on DRC	Instead of groundnut protein casein 1% may be used.
Groundnut Protein ...	Stabilising Agent	2.5 %		
Nonox P ...	Antioxidant	1 %		
Aluminium sulphate (as a 10% solution) ...	Coagulant	8 %	45 mts.	—
Formaldehyde ...	Preservative	1 %		
Total running time of Hollander Mixer			120 mts.	

Mechanism of Adhesion and Control of pH: The mechanism of adhesion is carried out by precipitating or coagulating rubber particles around each leather fibre in a very dilute condition and this lattice of fibres and binder is lifted over fine mesh metallic or nylon

MANUFACTURER OF EMPTY TIN CONTAINERS
IN ALL SIZES AND HOUSEHOLD IMPLEMENTS

pH control is very important in various stages of the manufacture of leather boards. At the soaking stage it is slightly alkaline and before addition of latex it is 7.5 or 8; and after the addition of coagulant it is 4.0.

of the major amount of water by suction are stacked one above the other in a hydraulic press with a separating medium in between each sheet and pressed at a pressure of 250 kgm./sq. cm. The boards are finally dried in a drying chamber under controlled conditions and the dried boards are calendered to smoothen the surface and they are finally hydraulically pressed at a fixed pressure of 300 kgm./sq. cm. The edges are trimmed off by a mechanical or hand shearing machine. Depending on the size of the suction box and or sheet formation machine and the hydraulic press the size of the boards would have to be adjusted. The boards as required in Indian market are generally of the size 25" x 30" and 2.0 to 4.5 mm. thickness.



If coloured boards with different grain embossed designs are desired for marketing, the boards have to be finished just like leather and pressed in hot in the hydraulic press with the desired plate, to give the necessary appearance.

The following are the physical properties (20% Rubber content board) of the boards fabricated and tested at C.L.R.I.

Tensile strength	...	1,170 lbs./sq. in.
Stitch tear strength	...	335 lbs./in.
Elongation at rupture	...	33-1/3%
Tear strength	...	65 lbs./in.
Bursting strength	...	550 lbs./in.
Abrasion resistance (25 revolutions)	...	0.03"
Apparent density	...	0.98
Stiffness factor	...	12,800 lbs./sq. in.
Water absorption	1/4 hr. ...	8%
	2 hrs. ...	20%
	24 hrs. ...	40%
Substance...	...	2 to 3.2 mm.

NOTE ON THE SCHEME PREPARED UNDER PRE-CONSTRUCTION COST ESTIMATION

1. Scheme 'A' is the minimum economic unit.

2. Scheme 'B' is double the capacity of the above plant.

Both these schemes offer the leather boards of size 25" x 30". If however the size of the board is enlarged the equipments for sheet formation, and hydraulic pressing may have to be modified affecting the costing towards capital expenditure.

Special Note: This process can be profitably taken up and the project started either

(i) as an independent unit for the manufacture of leather boards above or (ii) as an auxiliary extension unit attached to a mechanised tannery and installation of a few additional units of equipments or (iii) as an auxiliary to cardboard manufacturing unit when the cutter, digester, Hollander beater (pulp unit) sheet forming equipment, calendering machine etc. would be available.

ECONOMIC DATA

Name of Project—

Manufacture of Leather Boards.

Basis of Calculations:

1. Working days—300 days per annum.

2. Production Basis

(a) Output per working day ... 1/4 ton.

(b) Output per annum ... 150 tons.

CAPITAL OUTLAY FOR THE PROJECT

Buildings	...	25,000-00
Plant & Machinery	...	1,38,000-00
Laboratory equipment, accessories, essential spares and other sundries	...	2,000 00
Furniture & office equipment	...	1,200-00
Installation & erection charges (10% of plant & equipment)	...	13,800-00
		<u>1,80,000-00</u>

INVESTMENT ON BLOCK

Working capital to cover cost of raw materials, consumable stores, spares, fuel, labour & supervision, etc., based on 3 months working costs	...	75,000-00
Total capital outlay for the project.		<u>2,55,000-00</u>

COST OF PRODUCTION

Particulars	Quantity required annually	Rate	per	Amount per annum
'A' Raw material				
Veg. tanned leather trimmings	... 22.5 tons	225-00	ton	5,062-50
Rubber latex	... 11,000 gallons	12-50	gallon	1,37,500-00
Sulphated pungam oil	... 1,200 lbs.	1-00	pound	1,200-00
Aluminium sulphate	... 22,500 "	0-24	"	5,400-00
Dye	... 600 "	6-12	"	3,672-00
Wetting agent	... 300 "	4-00	"	1,200-00
Casein or groundnut protein	... 1 500 "	0-62	"	980-00
Anti-oxidant	... 600 "	3-80	"	2,280-00
Preservative (formaldehyde)	... 3,000 "	0-33	"	990-00
Ammonia	... 150 "	1-50	"	225-00
Soda ash	... 3,000 "	0-20	"	600-00
		Total of 'A'	...	<u>1,59,059-50</u>
'B' Utilities				
Electrical power (for process)	... 1,80,000 kwh.	0-09	kwh.	16,200-00
Water	... 30,00,000 gallons	0-50	gallon	1,500-00
Engineering	... at 5%		on plants	6,900-00
Services	... and 3%		on buildings	750-00
		Total of 'B'	...	<u>25,350-00</u>
'C' Labour and Supervision				
Direct labour	...	...	...	11,925-00
Direct Supervision	...	...	...	1,500-00
		Total of 'C'	...	<u>13,425-00</u>
'D' Packing				
Material	...	1,500-00		
Labour	...	525-00		
	Total of 'D'	2,025-00		
'E' Factory overheads (variable)				
Indirect labour	...	2,400-00		
Indirect supervision and administrative expenses	...	5,175-00		
Rent, rates, insurance taxes etc.	...	1,750-00		
Stationery & allied expenses	...	2,500-00		
	Total of 'E'	11,825-00		
'F' Factory overheads (fixed)				
Depreciation at 10% on plant & equipment	...	13,800-00		
5% Buildings	...	1,250-00		
Interest on working capital at 6%	...	4,500-00		
	Total of 'F'	19,550-00		
TOTAL COSTS				
Working costs 75,000-00 (for 3 months)				
(a) Raw material	...			1,59,059-50
(b) Utilities	...			25,350-00
(c) Labour and supervision	...			13,425-00
(d) Packing	...			2,025-00
(e) Factory overheads (variable)	...			11,825-00
(f) Factory overheads (fixed)	...			19,550-00
				<u>2,31,234-50</u>
Production per annum 150 tons at a cost of 2,35,000-00 (whole fig.)				
Cost of board per lb. 0.70				

PLANT COST

II. DETAILS OF EQUIPMENTS

No.	Name of Equipments	No. of Units	Unit Cost	Cost of Equipment	Installation Cost	Total Cost	Percentage Depreciation	Depreciation
1	Condux rotary knife cutter	1	12,500	12,500	100	12,600	7	882-00
2	Condux toothed disc mill	2	7,000	14,000	200	14,200	10	1,420-00
3	Condux refining mill	1	8,000	8,000	100	8,100	10	810-00
4	Hollander beater	1	13,000	13,000	1,000	14,000	6	840-00
5	Hollander mixer	1	3,000	3,000	100	3,100	6	186-00
6	Vibrating screen	1	9,000	9,000	100	9,100	5	455-00
7	Sheet forming unit (cylinder mould machine)	1	20,000	20,000	600	20,600	6-2/3	1,373-33
8	Calendering machine	1	14,000	14,000	200	14,200	8	852-00
9	Hydraulic press	1	17,000	17,000	200	17,200	7	1,204-00
10	Vertical agitators	2	2,000	4,000	150	4,150	5	207-50
11	Drying chamber	1	8,000	8,000	500	8,500	6-2/3	566-66
12	Pulp handling pump	1	2,000	2,000	—	2,000	6	120-00
13	Water supply pump	1	2,000	2,000	50	2,050	6	123-00
14	Storage tanks	4	1,000	4,000	—	4,000	5	200-00
15	Shaving machine	1	6,000	6,000	100	6,100	6	366-00
16	Butting machine	1	4,000	4,000	100	4,100	6	240-00
17	Hand shearing machine	1	2,000	2,000	—	2,000	5	100-00
18	Weighing machine	1	2,000	2,000	—	2,000	5	100-00
19	Misc. expend items such as pipe fittings, sieve, felt etc.	—	2,000	2,000	—	2,000	10	200-00

Total cost of equipments 1,50,000 Total depreciation 10,251-49

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2. Equipment (Plant) cost (including erection)	...	...	...	2,00,000-00
3. Working Capital (for 3 months)	...	...	...	1,40,000-00
Total Investment	...	...	...	3,70,000-00

DETAILS

I. BUILDINGS & REAL ESTATE

Type	Area	Cost	Cost
Katcha	2,000 sq. ft.	5-00 per sq. ft.	10,000-00
Pucca	1,700 sq. ft.	10-00 per sq. ft.	17,000-00
Water, Electricity, Drainage etc.			3,000-00
Total			30,000-00
Buildings & Land	...	...	30,000-00

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Factory : 51855

Grams : EMGISHA

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PLANT COST

II. DETAILS OF EQUIPMENTS

No.	Name of equipments	No. of Units	Unit Cost	Cost of Equipments	Installation Cost	Total Cost	Percentage Depreciation	Depreciation
1	Electro automatic feeder	1	10,000	10,000	100	10,100	6	606-00
2	Condux rotary knife cutter	1	12,500	12,500	100	12,600	7	882-00
3	Condux toothed disc mill	2	8,000	16,000	200	16,200	10	1,620-00
4	Condux refining mill	1	8,000	8,000	100	8,100	10	810-00
5	Hollander beater	1	13,000	13,000	1,000	14,000	6	840-00
6	Hollander mixer	1	3,000	3,000	100	3,100	6	186-00
7	Vibrating screen	1	9,000	9,000	100	9,100	5	455-00
8	Sheet forming unit (cylinder mould)	1	20,000	20,000	600	20,600	6-2/3	1,373-33
9	Calendering machine	1	14,000	14,000	200	14,200	6	852-00
10	Hydraulic press (cold)	1	17,000	17,000	200	17,200	7	1,204-00
11	Hydraulic press (with heating arrangement)	1	25,000	25,000	200	25,200	7	1,764-00
12	Vertical agitators	3	2,000	6,000	250	6,250	5	312-50
13	Drying chamber	1	10,000	10,000	600	10,600	6-2/3	706-66
14	Pulp handling pump	2	2,000	4,000	—	4,000	6	240-00
15	Water supply pump	1	2,000	2,000	50	2,050	6	123-00
16	Storage tanks	8	1,000	8,000	—	8,000	5	400-00
17	Shaving machine	1	6,000	6,000	100	6,100	6	366-00
18	Buffing machine	1	4,000	4,000	100	4,100	6	246-00
19	Hand shearing machine	2	2,000	4,000	—	4,000	5	200-00
20	Weighing machine	1	2,000	2,000	—	2,000	5	100-00
21	Miscellaneous items such as pipe fittings, sieve, felt etc.	—	2,500	2,500	—	2,500	10	250-00
Total cost of equipments			2,00,000				Total depreciation	13,536-49

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"Metha House"

No. 15, VENKATACHALA MUDALI STREET, PARK TOWN, MADRAS-3.

III. RAW MATERIALS COST

Materials	Quantity	Rate at	Cost
Leather Trimmings	16-2/3 cwts	225 ton	187-52
Rubber latex (60% solids)	73 gallons	12-50 gallon	912-50
Sulphated Pongam oil	80 lbs.	1-00 lb.	80-00
Soda Ash	20 "	0-20 "	4-00
Aluminium Sulphate	150 "	0-24 "	36-00
Formaldehyde	20 "	0-33 "	6-60
Sodium Lauryl sulphate	2 "	4-00 "	8-00
Non ox-P (Anti oxidant)	4 "	3-80 "	15-20
Ground Nut Protein (or casein)	19 "	0-62 "	6-20
Dye	4 "	6-12 "	24-48
Ammonia	1 "	1-50 "	1-50
			1,282-00
Total Raw Material Cost			1,400-00

IV. LABOUR AND SUPERVISION

Designation	No. of person	Wages per day	Salary
Works Manager	1	12-50	12-50
Supervisor	2	5-00	10-00
Skilled Labourers	10	3-00	30-00
Unskilled Labourers	17	1-75	29-75
Electrician	1	4-00	4-00
Mechanic	1	4-00	4-00
Accounts Clerk	1	4-00	4-00
Store Keeper	1	3-50	3-50
Peon	1	2-25	2-25
Total Wages			100-00

V. CAPITAL COST

Buildings & Land	...	30,000-00
Equipment (Plant) (Cost)	..	2,00,000-00
Total	...	2,30,000-00

VI. DETAILS OF WORKING CAPITAL

(1) Raw Material	...	1,400-00
(2) Labour and Supervision	...	100-00
(3) Fixed Charges such as Taxes (1% on Capital cost)	...	7-66
(4) Maintenance and Repair		
5% on Plant	}	36-33
3% on Buildings		
Working capital per day	...	1,543-99

For 90 working days capital required:
1,40,000-00 (Whole figure)

VII. TOTAL INVESTMENT

(a) Capital cost	...	2,30,000-00
(b) Working capital	...	1,40,000-00
Total Investment	...	3,70,000-00

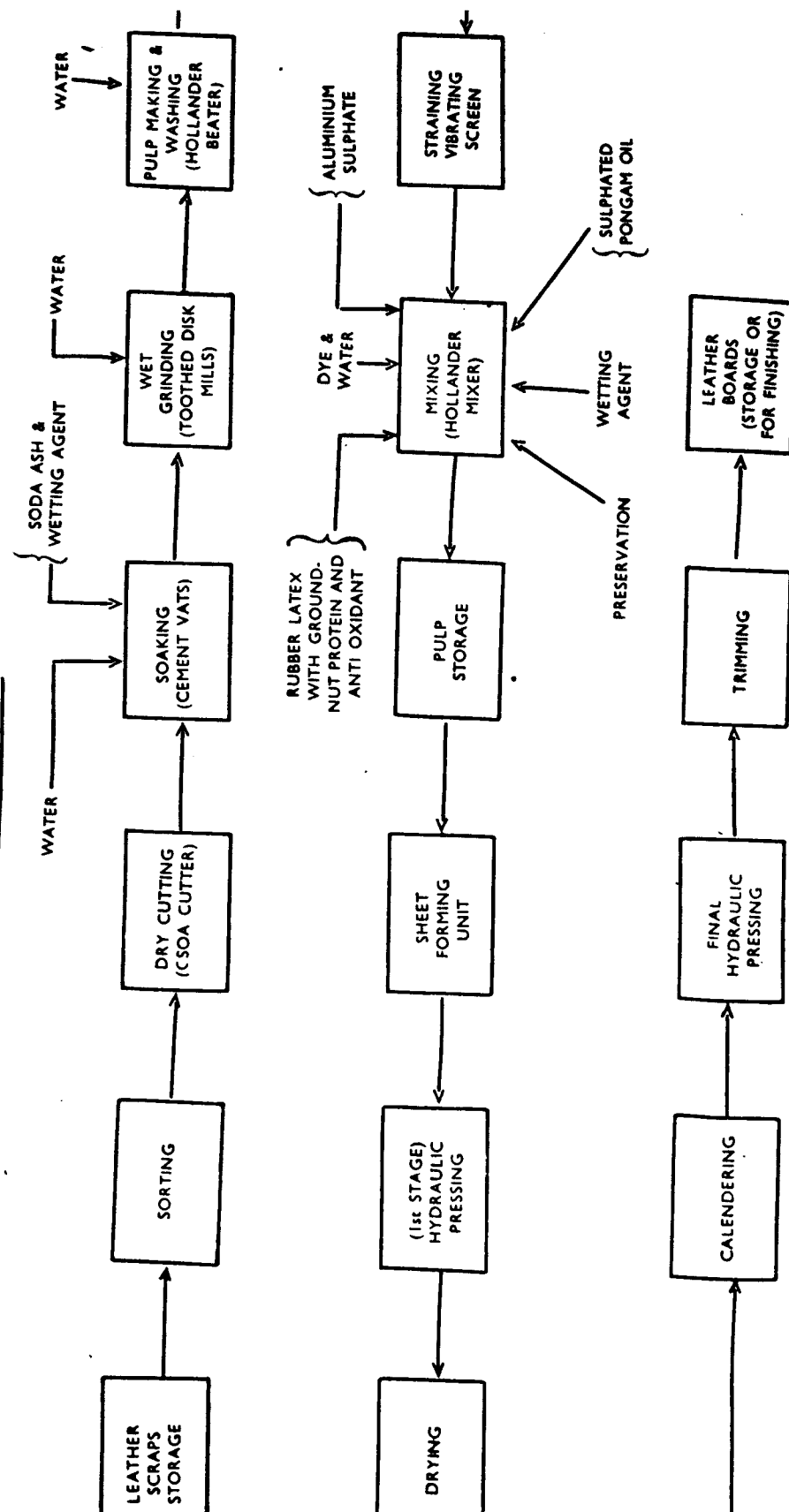
VIII. COST OF PRODUCTION PER DAY

Heads	Cost
Raw material	1,400-00
Labour & Supervision	100-00
Maintenance & Repair (5% on Plant; 3% on Buildings)	36-33
Taxes & Insurance	7-66
Office Management, Postage, Marketing etc. (1% on total Investment)	12-33
Depreciation on Plant (including 5% on buildings)	49-68
Interest at 6% on investment	74-00
Daily Operating Cost	1,680-00

Production contemplated or daily output ... 1 ton or 2,240 lbs.
Cost of Leather Board per pound ... 75 P.
Note: Prevailing Market rate 1-00 to 1-15 lb.

MANUFACTURE OF LEATHER BOARDS

FLOW DIAGRAM



LEATHER BOARD MANUFACTURE

Names of Machines		Names of Manufacturers
1. Rotary Knife Cutter	...	(Imported) M/s. Condux Work Ltd., Welfgang Bei Hanau, West Germany.
2. Toothed Disc Mills	...	(Imported) M/s. Condux Work Ltd., Wolfgang Bei Hanau, West Germany.
3. Hollander Beater	...	1. M/s. G. Williams & Co., Ltd., Dinsha Vachha Road, Bombay-1. 2. M/s. Indian Paper Machinery & Engineering Works Ltd., 9, The Mall, Dum Dum, Calcutta-28. 3. M/s. Eastern Paper Mills Ltd., South Dum Dum, Calcutta-37.
4. Hollander Mixer	...	Can be fabricated locally.
5. Vibrating Screen	...	1. M/s. Indian Paper Machinery & Engineering Works, Calcutta-28. 2. M/s. Eastern Paper Mills Ltd., South Dum Dum, Calcutta-37. 3. M/s. G. Williams & Co Ltd., Dinsha Vachha Road, Bombay-1.

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| 6. Pulp Handling Pump | ... | ... | 1. M/s. Eastern Paper Mills, Calcutta. |
| | | | 2. M/s. G. Williams & Co., Bombay. |
| 7. Water Supply Pump | --- | ... | Can be obtained locally. |
| 8. Sheet Forming Unit | --- | ... | 1. M/s. G. Williams & Co., Ltd., Bombay. |
| | | | 2. M/s. Eastern Paper Mills Ltd, Calcutta-37. |
| 9. Hydraulic Press | --- | ... | 1. M/s. Batliboi & Co., Ltd., Bharat House, Apollo Street, Bombay-1. |
| | | | 2. M/s. Lilihua Iron Works, 41, Chowringhee Road, Calcutta-16. |
| | | | 3. M/s. Eastern Paper Mills Ltd, Calcutta. |

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|----------------------------|-----|-----|--|
| 10. Calendering Machine | ... | ... | 1. M/s. G. Williams & Co., Ltd., Bombay-1. |
| | | | 2. M/s. Eastern Paper Mills Ltd., Calcutta. |
| | | | 3. M/s. Union Industrial Works, Dahanu Road., Dt. Thana (Bombay State) |
| | | | 4. M/s. B. G. Sapre & Co., Poona-1. |
| 11. Hand Shearing Machine | --- | ... | 1. M/s. Hind Foundry & Workshops, Ritumchend Road, Amritsar. |
| | | | 2. M/s. Eastern Paper Mills Ltd., Calcutta. |
| 12. Storage Tanks | --- | ... | Can be fabricated locally. |
| 13. Drying Chamber & Racks | --- | ... | 1. M/s. B. G. Sapre & Co., Poona-1. |
| | | | 2. M/s. Eastern Paper Mills, Calcutta-37. |
| | | | 3. M/s. G. Williams & Co., Ltd., Bombay-1. |

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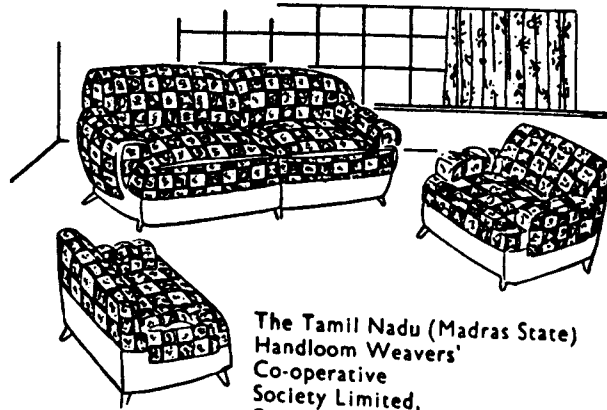
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A Division of the
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WHAT SMALL INDUSTRIES CAN YOU START?

(ISSUED BY THE CENTRAL SMALL INDUSTRIES ORGANISATION,
MINISTRY OF INDUSTRY, GOVERNMENT OF INDIA) SEPTEMBER 1963

INTRODUCTION

The third edition of the booklet 'What Small Industries Can You Start' was brought out on the 17th September, 1962. The first and second editions of this booklet were published in June and November, 1961 respectively. These publications incorporated a list of selected small industries having possibilities of development.

In the following list, the industries having prospects have been listed separately under three heads.

(A) where raw materials are available locally;

(B) where raw materials position is comparatively easy;

(C) where raw materials / machinery position is comparatively difficult. Those industries whose production programme has to be approved by the Development Commissioner, Small Scale Industries have also been indicated in the remarks column.

It is quite possible that the raw materials position in respect of some of the industries mentioned in this publication might change.

(A) LIST OF INDUSTRIES HAVING SCOPE FOR DEVELOPMENT FOR WHICH RAW MATERIALS ARE AVAILABLE LOCALLY.

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
I. Leather Manufacture					
1.	Leather tanning	...	Rs. 8-10 lakhs p.a.	1-0 lakh	2-0 lakhs
2.	Leather footwear	...	—	—	—
3.	Leather goods such as travelling kits, bags etc. (mechanised unit)	...	Rs. 3-0 lakhs p.a.	0-5 „	1-0 „
4.	Kattai Leather	...	300 pieces per day or Rs. 6 lakhs p.a.	1-5 „	2-5 „
5.	Bag tanned sole leather	...	50 pieces per day Rs. 5 lakhs p.a.	0-4 „	1-5 „
6.	Hand gloves	...	2 000 pieces per day	0-10 „	0-66 „

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
7.	Fancy leather goods & travelling requisites ...	1,000 pieces p.m. Rs. 1 lakh	0-10 lakh	1-60 lakhs	
8.	Ladies sandals and pathani chappals ...	150 pairs a day	0-10 "	0-75 "	
9.	Bone digester-sum-flaying ...	...	...	...	
10.	Carcase utilisation and tanning ...	...	...	...	
11.	Children's footwear ...	...	...	...	
12.	Cycle leather saddle tops ...	...	...	...	
13.	Dust shield leather ...	...	...	...	
14.	Leather for sports goods ...	...	...	...	
15.	Ammunition boots and officers army type shoes ...	...	...	...	
16.	Chrome tanning unit ...	...	...	...	
17.	Leather covers for footballs and volley balls ...	150 covers per day	10,000	30,000	
18.	Cemented sandals ...	150 pairs per day	15,000	40,000	
19.	Desi juti on lasts ...	25 pairs per day	1,000	10,000	
20.	Sole leather ...	70 hides per day	75,000	1-5 lakhs	

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S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
21.	Harness & saddlery manufacturing unit ...	...	...	...	
22.	Raw hide picker manufacturing unit ...	...	...	...	
23.	Fur tanning unit ...	...	...	...	
24.	Leather board making unit ...	...	...	...	
25.	Light leather ...	...	...	...	
26.	Moulded leather goods ...	...	...	...	
II. Sports Goods					
1.	Football, volley ball and basket balls ...	...	...	...	
2.	Tennis, badminton and squash rackets ...	...	...	...	
3.	Hockey sticks, cricket stumps, cricket bats (Kashmir willow) ...	...	...	...	
4.	Javeline, discs, parallel bars and fishing rods ...	...	...	...	
5.	Carrom boards, ping pong tables, ping pong bats, Chinese checker ...	...	...	...	
6.	Soft leather sports goods e.g. leg guards, abdomen guards, cricket gloves etc. ...	...	...	...	
7.	Rubber bladders, rubber balls, tennis balls ...	...	...	...	
8.	Football inflators, referee's whistles, dumble, barbles, chest expanders and other items of light mechanical engineering sports goods ...	...	...	...	
9.	Sporting nets e.g. anklets, knee caps and other items of textiles and hosiery goods required for sports ...	...	...	...	
10.	Medals, shields, cups etc. ...	...	...	...	
III. Timber Industries					
1.	Wood wool ...	...	...	...	
2.	Tooth picks ...	...	...	...	
3.	Tool handles for screw drivers, files, axes, hammers etc. ...	...	...	...	
4.	Bobbins ...	...	...	...	
5.	Timber seasoning ...	...	...	...	
6.	Plywood (tea chests) ...	...	...	...	
7.	Packing cases ...	...	...	...	
8.	Country crafts ...	...	...	...	

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
IV. Chemicals and Allied Industries			Rs.	Rs.	
1.	Fish canning ...	—	—	—	
2.	Crystallised ginger, dehydrated vegetables	—	—	—	
3.	Pectin ...	—	—	—	
4.	Fibre from banana stalks	—	—	—	
5.	Fish oil and fish meal ...	—	—	—	
6.	Bakery ...	—	—	—	
7.	Soap nuts based products	—	—	—	
8.	Santonin ...	—	—	—	
9.	Refining of silica	—	—	—	
10.	Lavigation of cohres (pigment)	—	—	—	
11.	Phenyle making	—	—	—	
12.	Essential oils ...	Rs. 2 lakhs p.a.	0.6 lakh	1.00 lakh	
13.	Rosa oil ...	—	—	—	
14.	Starch from tamarind seed	—	—	—	
15.	Ragi malt ...	—	—	—	
16.	Calcium carbonate	—	—	—	
17.	Rice bran oil ...	15 to 20 tons p.d.	4.0 lakhs	5.0 lakhs	
18.	Babul bark disintegrating	—	—	—	
19.	Guar gum ...	—	—	—	
20.	Tapioca starch & manioc meal	—	—	—	
V. Mineral Industries					
1.	Glass scientific apparatus	—	—	—	
2.	China crockery (cups & saucers)	—	—	—	
3.	Glazed tiles ...	—	—	—	
4.	Raniganj tiles ...	—	—	—	

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
5.	Slate ...	—	—	—	
6.	Electrical porcelainware ...	—	—	—	
7.	Sanitarywares ...	—	—	—	
8.	Mangalore tiles	—	—	—	
9.	Concrete based flooring tiles	—	—	—	
10.	Prestressed concrete poles	—	—	—	
11.	Cement pipes & collars	—	—	—	
12.	Mica insulating bricks	—	—	—	
13.	Mica powder ...	—	—	—	
14.	Grinding wheels	—	—	—	
15.	Gypsum plaster boards	—	—	—	
VI. Electrical Industries					
1.	Electrical cleats	—	—	—	
2.	Mica elements	—	—	—	
3.	Ceramic condensers	—	—	—	
VII. Rubber Manufacture					
1.	Rubber contraceptives	—	—	—	
2.	Latex cement	—	—	—	
VIII. Miscellaneous Non-engineering Industries					
1.	Rope making (mechanised unit)	—	—	—	
2.	Paint brushes ...	Rs. 1.0 lakh p.a.	0.23 lakh	0.50 lakh	
3.	Industrial brushes	Rs. 1.0 lakh p.a.	0.30 "	0.60 "	
4.	Domestic brushware from coir bristles	—	—	—	

(B) LIST OF INDUSTRIES WHICH CAN BE STARTED ON SMALL SCALE AND FOR WHICH
RAW MATERIAL POSITION IS COMPATIVELY EASY.

S. No.	Item	Capacity per unit	Investment required for machinery and equip- ment	Total capital cost per unit (including land, build- ing and machinery)	Remarks
I. Light Mechanical Engineering Industries			Rs.	Rs.	
1.	Structural items like gates, trusses etc.	60 tons p.m.	52,000	2,00,000	
2.	Cut throat razor	—	—	—	
3.	Foot valves (stainers of various sizes)	—	—	—	
4.	Gears (spur and bevel—various sizes)	2,500 p.m.	8-5 lakhs	5-00 lakhs	
5.	Aluminium builders' hardware	5 lakhs p.a.	80,000	90,000	
6.	Hollow aluminium rivets	—	—	—	
7.	Steel windows frames and fittings used in building construction	—	—	—	
8.	Sliding door tracks for wooden show cases	—	—	—	
9.	Aluminium expanded grills for windows, radios and other decorative purposes	—	—	—	
10.	Nail cutters	—	—	—	
II. Small Tools and Hand Tools					
1.	Diamond tip tools	—	—	—	
2.	Hair clippers	—	—	—	
3.	Machine tool parts	100 lathe centres, sockets, sleeves, mandrals and lathe chucks each p.m.	2-50 lakhs	3-50 lakhs	
4.	Smithy hand tools	—	—	—	
III. Other Engineering Industries					
1.	Light forging (stampings)	500 tons p.a.	2-20 lakhs	4-30 lakhs	
2.	Hot aluminising of ferrous materials	—	—	—	
3.	Spindle insert	—	—	—	

S. No.	Item	Capacity per unit	Investment required for machinery and equip- ment	Total capital cost per unit (including land, build- ing and machinery)	Remarks
			Rs.	Rs.	
4.	Pressure gauges	—	—	—	Production programme to be approved by DC (SSI).
5.	Hydraulic jacks for pressing concrete based flooring tiles	—	—	—	
6.	Drawing boards, T squares and drafting stands	2,400 Nos. p.m.	9,000	46,000	
7.	Turned round blocks for switches, button holders, lamp holder, plugs etc.	67,000 Nos. p.a.	7,960	14,700	
8.	Casing and caping	2,00,000 ft. p.a.	10,450	15,750	
IV. Automobile Parts and Ancillaries					
1.	Mechanical jacks	—	—	—	
2.	Hydraulic brake hose assembly	—	—	—	
3.	Water pumpkit	—	—	—	
4.	Gudgeon pins	—	—	—	
5.	Clutch carrier assembly	—	—	—	
6.	Clutch plates	—	—	—	
7.	Gun metal bushes for leaf spring assembly	—	—	—	
8.	Dimpling tools	—	—	—	
9.	Steel segment rings	—	—	—	
10.	Mechanical and electrical fuel pumps	—	—	—	
11.	Automobile hub drums	—	—	—	
V. Electrical Industries					
1.	Coil packs	200 gross p.m.	20,000	60,000	Production programme to be approved by DC (SSI).

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
2.	Valve holders	600 p.m.	30,000	1.0 lakh	
3.	Blinkers	600 p.m.	30,000	1.0 "	
4.	Power transformers	750 p.m.	2.71 lakhs	4.68 lakhs	
5.	Carbon resistances	—	—	—	Production programme to be approved by DC (SSI).
6.	Carbon granule micaphones	—	—	—	Do.
7.	Paper cones for loudspeakers	—	—	—	Do.
8.	Industrial and domestic time switches	—	—	—	Do.
9.	Train lighting bulbs	—	—	—	
10.	Micro switches, side lock fuse carriers, rotary cable switch	—	—	—	
11.	Wind screen wiper motor	—	—	—	
12.	Electric hand tools	—	—	—	
13.	Synchronous induction motors (FHP)	—	—	—	
14.	Variable speed motors	—	—	—	
15.	Motor generator welding set	—	—	—	
16.	Butt and seam welding machines	—	—	—	
17.	Dropout fuses and gang switch assembly	—	—	—	
18.	Motorised hand blowers	—	—	—	
19.	Insulation tapes	—	—	—	
VI. Leather Manufactures					
1.	Footwear (mechanised unit)	Rs. 3.10 lakhs p.a.	1.5 lakhs	2.5 lakhs	
2.	Picking band	3 tons p.m. Rs. 3 lakhs p.a.	0.25 lakh	0.5 lakh	

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
3.	Leather belting	1 ton p.m. Rs. 1 lakh p.a.	0.25 "	0.5 "	Good scope for waist belts.
4.	Holdalls	—	—	—	
VII. Sports Goods					
1.	Shuttle cocks	—	—	—	
2.	Cricket and hockey balls	150 balls per day	10,000	10,000	
3.	Cricket bats (English willow)	—	—	—	
4.	Ping pong (table tennis) balls	—	—	—	
VIII. Chemicals and Allied Industries					
1.	Electroplating unit (servicing & jobbing work)	Rs. 1 lakh p.a.	0.5 lakh	0.75 lakh	
2.	Bone, glue and cassia	Rs. 6-10 lakhs p.a.	3.5 lakhs	3.0 lakhs	
3.	Adhesive tapes	Rs. 4 lakhs	1.0 "	2.0 "	
4.	Printing and litho inks	Rs. 3.0 lakhs p.a.	0.50 "	1.00 "	Needs approval of production programme by DC (SSI).
5.	Guts from animal intestine	—	—	—	
6.	Plastic coated paper & cloth	—	—	—	
7.	Photographic plates and paper	—	—	—	
8.	Cashew shell oil	40,000 litres p.a.	5,000	20,000	
9.	Annoilizing plant	—	—	—	
10.	Polythene film and lay-flat tubes	—	—	—	
11.	Urea buttons	—	—	—	
12.	Plastic novelties (Stationery)	—	—	—	
13.	Talcum powder	One ton per day	25,000	30,000	

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
14.	Cattle feed compound	—	—	—	
15.	Vitreous enamel (sign & sign boards)	—	—	—	
16.	Milk products	—	—	—	
17.	Boiled linseed oil	62.5 M. tons	0.75 lakh	1.5 lakhs	Comparatively better scope in Madhya Pradesh.
18.	Thymol from Ajwan seed oil	600 lbs.	0.30 "	1.0 "	Do.
19.	Silica gel	—	—	—	
20.	Cosmetics and hair oils	—	—	—	
21.	Perfumery chemicals	—	—	—	
22.	Mineral grinding	2,500 tonnes p.a.	1.25 lakhs	4.50 lakhs	
23.	Artist colours	—	—	—	
IX. Rubber Manufactures					
1.	Rubber canvas shoes	Rs. 5 lakhs p.a.	2.0 "	3.0 "	
2.	Retreading of old motor tyres (assorted)	5,000 tyres per year Rs. 1.5 lakhs per annum	0.5 "	0.75 "	
3.	Microforous rubber separators for storage batteries	Rs. 2 lakhs	1.35 "	2.00 "	
4.	Rubber hoses, hospital sheeting and football bladders	—	—	—	
5.	Dipped rubber goods	—	—	—	
6.	Moulded rubber goods	—	—	—	
7.	Surgical hand gloves	—	—	—	
8.	Rubberised canvas belting	—	—	—	

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
			Rs.	Rs.	
9.	Rubber rollers for duplicators and rubber plates for typewriter machines.	—	—	—	
X. Mineral Industries					
1.	Achromatic lenses for optical instruments	Rs. 1.2 lakhs pieces p.a.	0.50 lakh	1.00 lakh	
2.	Rough blanks	12,500 doz. p.a.	0.95 "	1.55 "	
3.	Lens grinding rings	—	—	—	
4.	Pressed glassware	—	—	—	
5.	Instrument lenses	—	—	—	
6.	Glass containers	—	—	—	
7.	Glass wool	—	—	—	
8.	Industrial safety goggles	—	—	—	
9.	Cosmetic bottles & flasks	—	—	—	
10.	Glass marbles	—	—	—	
11.	Hollow building bricks	200 lakhs per year	3.20 "	5.0 "	
12.	Fire bricks	15 lakhs p.a.	1.33 "	5.30 "	
13.	Ceramic packing rings	Rs. 5,37,600 p.a.	0.40 "	1.29 "	
14.	Pressed porcelain	—	—	—	
15.	Stoneware pipes	—	—	—	
16.	Chemical stoneware	—	—	—	

(C) LIST OF SMALL INDUSTRIES WHICH HAVE GOOD PROSPECTS BUT WHERE
RAW MATERIAL/MACHINERY POSITION IS COMPARATIVELY DIFFICULT

S. No.	Item	Capacity per unit	Investment required for machinery and equip- ment	Total capital cost per unit (including land, build- ing and machinery)	Remarks
I. Mechanical Engineering Industries					
(a) Light Engineering					
1.	Split pins ...	—	—	—	
2.	Collets and collet chucks ...	2,500 collets p.m.	3.5 lakhs	5.0 lakhs	
3.	Safety razor ...	—	—	—	
4.	Spray paint guns ...	—	—	—	Production programme to be approved by DC (SSI).
5.	High tensile bolts & nuts ...	—	—	—	
(b) Small Tools and Hand Tools					
1.	Drill chucks for use on drilling machine ...	625 Nos. p.m.	2.0 "	2.74 "	
2.	Carbide tipped tools ...	—	—	—	
3.	Taps and dies ...	—	—	—	
4.	Spanners, wrenches, tyre openers etc. ...	—	—	—	
II. Instruments					
1.	Drawing instruments (compass with two needles points, pen and pencil points, drawing pins, lengthening bars) ...	250 sets p.m.	1.01 "	1.31 "	
2.	Hypodermic needles ...	5,000 Nos. per day	32,000	55,000	
3.	Scientific instruments (microscopes, PH meters etc.) ...	—	—	—	Needs approval of production programme by DC (SSI).
4.	Electrical measuring instruments ...	100 pieces a day	2.0 lakhs	2.75 lakhs	Do.
5.	Taxi meters ...	—	—	—	Do.

S. No.	Item	Capacity per unit	Investment required for machinery and equip- ment	Total capital cost per unit (including land, build- ing and machinery)	Remarks
6.	Watch cases ...	—	—	—	
7.	Precision instruments such as vernier callipers micro-meters, gauges etc. ...	—	—	—	
8.	Main springs for gramophones ...	—	—	—	
9.	Surgical instruments ...	—	—	—	Production programme to be approved by DC (SSI).
10.	Electro-medical appliances like diathermy, cardiography testing and measuring appliances ...	—	—	—	
III. Automobile Ancillaries					
1.	Automobile sealed beams ...	50 pieces per day	0.70 lakh	1.25 lakhs	
2.	Automobile electrical equipment like blinking trafficators, distributors, ignition coil, fuel pump etc. ...	Blinking Trafficators—10 Ignition coils—10 Fuel pumps — 5	4.0 "	5.0 "	
3.	Electro-magnetic type trafficators ...	—	—	—	
4.	Auto flasher signal ...	—	—	—	
5.	Spring washers ...	—	—	—	
6.	Hydraulic lifting jacks ...	5,000 Nos. p.m.	1.0 "	1.55 "	
7.	Garage tools ...	100 sets p.m.	4.5 "	6.0 "	
8.	Garage belts & sheckle belts ...	250 pieces per day	1.5 "	1.0 "	
9.	Auto head light carriage lenses ...	—	—	—	
IV. Electrical Industries					
(a) Radio Components					
1.	Tone and volume controls (poteptio meters) ...	1,000 p.m.	54,000	1.12 lakhs	Do.
2.	Electrolytic condensers ...	6,000 p.m.	1.0 lakh	2.5 "	Do.
3.	Gang condensers ...	1,000 p.m.	50,000	2.20 "	Do.
4.	Mica condensers and trimmers ...	900 gross p.m.	40,000	1.20 "	Do.
5.	Wave band, switches (rotor and push button type) ...	6,000 p.m.	30,000	1.0 "	Do.
6.	Metal rectifiers ...	10,000 p.m.	15,000	40,000	Do.

S. No.	Item	Capacity per unit	Investment required for machinery and equipment	Total capital cost per unit (including land, building and machinery)	Remarks
(b) Other Electrical Industries			Rs.	Rs.	
7.	F.H.P. Motors ($\frac{1}{2}$ H.P. & below) ...	300 p.m.	98,000	1.83 lakhs	Production programme to be approved by DC (SSI).
8.	Pen-type electrical potential testers ...	1,000 p.m.	30,000	1.0 "	
9.	Electric toys ...	—	—	—	
10.	Industrial furnaces with temperature control ...	—	—	—	
11.	Thermostat (sunvic type) ...	20 pieces per day	70,000	1.0 "	
12.	Centrifugal switches ...	20 pieces per day	80,000	2.0 "	
13.	Soldering iron ...	—	—	—	
14.	Electric horns for scooters ...	—	—	—	Do.
15.	Printed circuits ...	—	—	—	
16.	Tubular elements ...	5,000 p.m.	1.0 lakh	1.70 "	
17.	Electric water heaters (storage type) and geysers ...	—	—	—	
18.	Hospital equipment such as sterilisers, heating pads, pillows etc. ...	250 pieces p.m.	5,000	53,000	
19.	Battery chargers ...	150 pieces p.m.	10,000	—	
V. Chemicals and Allied Industries			Rs.	Rs.	
1.	Calcium silicate ...	—	—	—	
2.	Rubber lining and chemical equipment ...	—	—	—	
3.	Glass lining ...	—	—	—	
4.	Synthetic driers ...	—	—	—	Needs approval of production programme by DC (SSI).
5.	Plastic blow moulded items ...	—	—	—	
6.	Paints, varnishes, lacquers, distempers and cement colours etc. ...	—	—	—	Do.
7.	Drawing and mathematical instruments (plastic) ...	—	—	—	
8.	P. V. C. Shoes ...	—	—	—	
9.	Insecticides and pesticides formulation ...	—	—	—	Do.
10.	Fruits and vegetable preservation ...	—	—	—	
11.	Sensitized paper ...	—	—	—	
12.	Transfer paper for metals, glass and ceramics ...	—	—	—	
13.	Coloured mirrors etc. ...	—	—	—	



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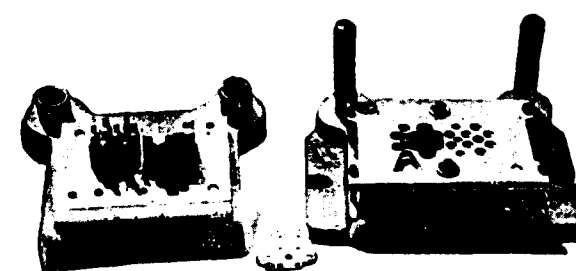
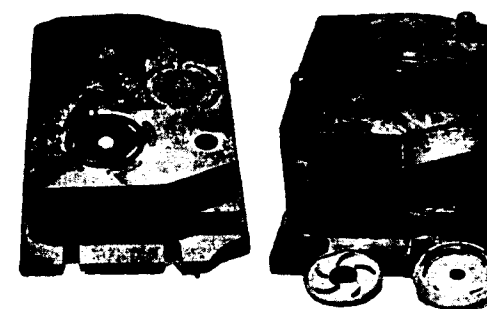
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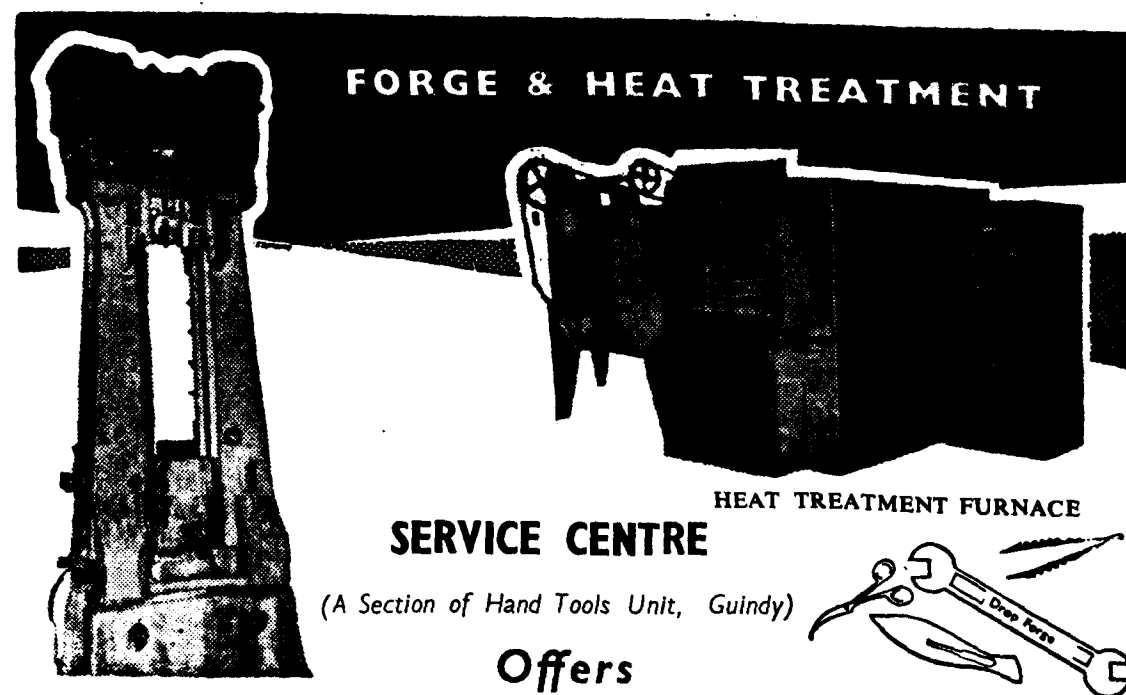
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MANUFACTURE OF FLUORESCENT TUBES

SCOPE FOR ESTABLISHMENT OF NEW UNITS

The demand for fluorescent tubes by the end of the Fourth Plan period is estimated to be of the order of 30 million numbers per annum, in view of the fact that practically all industrial units, commercial establishments, offices and railways, require fluorescent lighting facilities. These lamps are being used increasingly in domestic and street lighting. At present there are eleven units in the large scale sector licensed for the manufacture of fluorescent tubes to a capacity of 11.5 million numbers. Production, however, is only around 3.2 million numbers per year. There is, therefore, scope for setting up a few more units for the manufacture of fluorescent lamps to meet at least a major portion of the demand.

The capital equipment required for establishing a unit with a capacity of 1.5 million numbers per annum is about Rs. 16.5 lakhs

(imported) and Rs. 5 lakhs (indigenous). Import of raw materials such as fluorescent powder, etc., is allowed to manufacturers of fluorescent lamps. Import of glass tubings and glass shells is also allowed on restricted basis taking into account their availability from indigenous sources.

Applicants desiring to establish a unit have to make suitable collaboration arrangements for the import of capital equipments so that the Government of India may not be called upon to release foreign exchange for the purpose in view of difficult foreign exchange position. Only applications which have made satisfactory foreign collaboration arrangements would be considered by the Government of India, for the grant of licence under the Industries (Development and Regulation) Act.

SCOPE FOR POWER-DRIVEN PUMP INDUSTRY

The demand for the larger size and special type of power-driven pumps has increased in recent years. There are at present 68 units in the country engaged in the production of power-driven pumps and the combined output of these units was about 1 55 000 nos. in 1963, while the target set by the Development Council for Diesel Engines and Power-driven pumps is about 2 00 000 nos. At present most of the factories in the country are engaged in

the manufacture of pumps upto 25,000 lpm capacity. There are a few units engaged in the manufacture of pumps upto 70 000 lpm. but hardly any which manufacture pumps of still higher capacity. Pumps to the value of Rs. 3.4 crores per year are being imported. There is considerable demand for larger size pumps and special type of pumps and there is scope in this line of manufacture.

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LICENCES UNDER THE INDUSTRIES (DEVELOPMENT AND REGULATION) ACT 1951

The Government of India have published a list of industries, in respect of which applications for licences under the Industries (Development & Regulation) Act, 1951 may ordinarily be **rejected** without reference to the Licensing Committee. The list comprises 195 industries—89 engineering and 106 non-engineering—and will be current till 31st December 1964. (List—I)

Simultaneously the Union Government have also announced a list of 149 industries, in respect of which applications for licences under the Industries (Development & Regulation) Act, 1951 will be considered on merits. The list, which consists of 79 engineering and 70 non-engineering industries will be valid upto the end of 1964. (List—II).

List I

A—ENGINEERING INDUSTRIES

- | | |
|---|--|
| 1. Agricultural implements.
(excluding tractor drawn). | vi. Clutch plates and clutch assemblies |
| 2. Air compressors.
(expansion of the existing units for compressors upto 700 cfm. will be permitted). | vii. Distributors. |
| 3. Aluminium strips, sheets, circles foils extruded rods and sections. | viii. Dynamos. |
| 4. Antimony
(except for expansion scheme) | ix. Electric horns. |
| 5. Automobile ancillaries.
(Only expansion or diversification in the range of the same products of the existing units will be considered). | x. Filters. |
| i. Axles. | xi. Fuel injection equipment. |
| ii. Brake assembly. | xii. Gaskets. |
| iii. Brake drums. | xiii. Gasolene tanks. |
| iv. Brake linings. | xiv. Gears and shafts. |
| v. Carburettors. | xv. Head/tail and side lamp fittings. |
| | xvi. Ignition coil. |
| | xvii. Inlet and exhaust valves. |
| | xviii. Jacks (hydraulic, machanical and manually operated) upto 100 tons capacity. |
| | xix. King pins. |
| | xx. Oil seals. |
| | xxi. Panel instruments. |

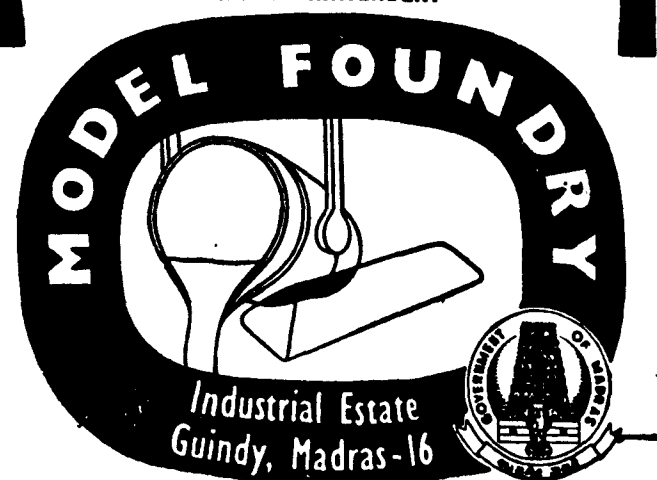
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machinery
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facilities

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- xxii. Piston assembly including piston rings and piston pins.
- xxiii. Push rods.
- xxiv. Radiators.
- xxv. Regulators.
- xxvi. Rocker arms.
- xxvii. Shackle pins.
- xxviii. Shock absorbers.
- xxix. Silencers, muffler pipes etc.
- xxx. Spark plugs.
- xxxi. Starter meters.
- xxxii. Tappets.
- xxxiii. Thin walled bearings.
- xxxiv. Tie rod ends.
- xxxv. Tipping gears.
- xxxvi. Tyre inflaters.
- xxxvii. Valves for tyres and tubes.
- xxxviii. Wheels for motor vehicles and agricultural tractors.
- 6. Ball and roller bearings.
(except when the expansion is desirable for making the unit an economic one).
- 7. Barbed wire.
- 8. Bare copper conductors.
- 9. Bare copper strips.
- 10. Bicycles and bicycle parts.
(except when expansion of bicycle tube valves is desirable for making the unit an economic one.)
- 11. Bifurcated rivets.
- 12. Bolts, nuts and rivets.
- 13. Brass, copper extruded pipes and tubes extruded rods and sections and sheets circles strips.
- 14. Car lifts.
- 15. Cast iron pipes including spun pipes.
- 16. Chaff cutter blades.
- 17. Cinema arc carbons.
- 18. Circles, sheets, rods and utensils of stainless steel.
- 19. Collapsible tubes and rigid containers.
- 20. Commercial vehicles.
(except expansion schemes).
- 21. Conductors (A.C.S.R. / A.A.).
- 22. Conduit pipes.
- 23. Convoyer belting.
- 24. Copper virgin.
- 25. Copper wire for non-electrical purposes.
- 26. Cotton and hair belting.
- 27. Crawler tractors.
- 28. Domestic utensils.
- 29. Domestic refrigerators.
- 30. Drawing of wire-mild as well as special steel.
- 31. Drop forged tools.
- 32. Drums and barrels and tin containers excepting those for manufacturers' own requirements.
- 33. Electric fans.
- 34. Expanded metal.
- 35. Ferro-manganese.
- 36. Ferro-silicon.
- 37. Flash light and torch containers.
- 38. Fork lift trucks and the like.
- 39. Heavy earth moving equipment.
(only shovels).
- 40. Household appliances such as electric irons, heaters and the like.
- 41. Hurricane lantern.
- 42. H. T. switch-gears 33 k. v. and above.
- 43. Industrial fans and blowers.
- 44. Internal combustion engines including petrol kerosene and marine engines.
(except expansion schemes).
- 45. Jeep type vehicles and station wagons.
- 46. Kerbside petrol pumps.
- 47. Lead-virgin.
- 48. Motors—single and polyphase.
- 49. Miniature lamps.
(except automobile headlight lamps).

- 50. Motor vehicles and scooters, auto-cycles, mopeds and three wheelers.
- 51. Non-ferrous alloys.
- 52. Non-ferrous castings.
(including pressure die castings).
- 53. Paper and pulp making plants upto 25 tons per day capacity including wire-cloth for paper machinery.
- 54. Passenger cars.
- 55. Photo flash lamps.
- 56. Plates and sheets (M.S.).
(except for main producers)
- 57. Railway wagons.
(except when the expansion is desirable for making the unit an economic one).
- 58. Razar blades.
- 59. Road roller.
(Expansion and diversification of the existing units will be considered).
- 60. Rolling shutters.
- 61. Room air-conditioners.
- 62. Rubber ply transmission belting.
- 63. Solvent extraction plant.
- 64. Saws of all types.
(excluding hacksaw blades).
- 65. Steel pipes and tubes (welded).
(except when the expansion is desirable for making the unit an economic one).
- 66. Steel doors & windows.
- 67. Steel sheets (black)—galvanizing and corrugation of (except for main producers).
- 68. Steel measuring tapes.
- 69. Steel—re-rolled products including wire rods.
- 70. Stranded wire.
- 71. Sugar mill machinery.
(except milling plant and centrifugals).
- 72. Tea processing machinery.
- 73. Trailers.
(except expansion of existing units).
- 74. Tungsten carbide tips and intermediates thereof.
- 75. Twist drills.
- 76. Vacuum cleaners.
- 77. V. I. R. and P. V. C. cables.
(except power cables).
- 78. Washing machines.
(except industrial washing and dry-cleaning machines).
- 79. Water coolers and ice plants.
- 80. Water meters.
- 81. Welding electrodes.
except when the expansion is desirable for making the unit an economic one).
- 82. Welded wire mesh.
- 83. Winding wires.
- 84. Wire—M. S. Med/H. C. and special wire.
- 85. Wire nails.
- 86. Wire ropes
(except when the expansion is desirable for making the unit an economic one).
- 87. Wood screws.
- 88. Zinc virgin.
- 89. Zinc sheet/strips.

B—NON-ENGINEERING INDUSTRIES

- 1. Abrasive grains including silicon carbide.
- 2. Acetic acid.
- 3. Activated bleaching earth.
- 4. Art silk weaving, hosiery, twisting, doubling and synthetic yarn crippling / stretching by other than primary yarn manufacturers.
- 5. Azo dyes.
- 6. Barium carbonate.
- 7. Barium chloride.
- 8. Barium nitrate.
- 9. Barium sulphate.
- 10. Basic dyes.

11. Beer.
12. Beta naphthylamine.
13. Bichromates.
14. Blanc fixe.
15. Bleaching powder.
16. Borax and boric acid.
17. Bottles and vials.
(excluding penicillin vials.)
18. Brake fluid.
19. Calcined petroleum coke.
20. Calcium carbide.
21. Calcium Carbonate.
(precipitated and activated).
22. Camel back.
23. Camphor.
24. Carbon black.
25. Carbon dioxide gas.
(other than by-product carbon dioxide.)
26. Carboxy methyl cellulose.
27. Cashew kernels.
(applications from new areas to be considered on merits.)
28. Cellulose acetate flakes for moulding powder.
29. Cellulose film.
(Cellophane.)
30. Copper sulphate.
31. Cosmetics and toiletries.
32. Cotton mesh fabrics.
33. D. D. T.
(excepting for expansion.)
34. Dissolved acetylene gas.
35. Drugs and pharmaceuticals.
 - i. Antibiotics—penicillin, streptomycin and tetramycine
 - ii. Anti-dysentery drugs which are quinoline derivatives.
 - iii. Bismuth salts.
 - iv. Chloral Hydrate.
 - v. Empty hard gelatine capsules.
- vi. P. A. S. acid and salts.
- vii. Salicylic acid-sodium salicylate acetylsalicylic acid.
- viii. Sulpha drugs.
- ix. Surgical adhesive tapes.
- x. Vitamin 'A'.
- xi. Vitamin 'C'.
36. East India tanned (semi-tanned) kips and skins.
37. Fast colour bases.
38. Fire works and papers caps.
39. Gelatine (edible, photographic and technical, except pharmaceutical.)
40. Glass, mineral wool and allied products.
41. Glass fibre and products thereof.
42. Glass-hollow-ware (semi-automatic)
43. Glass-table and pressed-ware.
44. Glass tubes and rods
(hand made). sheet-glass, glass-bottles, wired/figured and rolled glass.
45. Graphite electrodes.
46. H. T./L. T Insulators.
47. Hoses (vacuum brake)
48. Hoses (other types.)
49. Hydrogen peroxide.
50. Laminates.
(industrial and decorative including malamine laminates.)
51. Lead oxides.
52. Manganese metal and manganese dioxide.
53. Match.
54. Menthol.
55. Methanol.
56. Myrobalan extract.
57. Naphthols.
58. * Newsprint.

* Applications for substantial expansion from existing units as well as applications for setting up of new units in areas, where raw materials resources have remained untapped would be considered on merits.

59. Nitric acid.
60. Organic pigments.
61. Oxygen gas.
(as applied for cutting and welding of steel only.)
62. Paper and paper board.*
63. Pesticidal formulations.
except formulations based on B. H. C., malathion and Dithic Carbonate).
64. P. F. Moulding powder.
65. Phenol.
66. Photographic raw film and paper.
67. Phthalic anhydride.
68. Polystyrene.
69. Polyethylene.
70. Polyvinyl acetate.
71. Pottasium chlorate.
72. Pottasium permanganate.
73. Processing (excluding printing) of cotton textiles.
74. P.V.C. resins compositions.
75. Pulp (paper and rayon grade).*
76. Rayon tyre cord yarn.
77. Reclaimed rubber.
78. Refractories.
79. Refrigeration gases.
80. Rubber accelerators and antioxidants.
81. Sanitaryware.
82. Soap.
83. Sodium aluminate.
84. do bicarbonate.
85. do hydrosulphite and derivatives.
86. do sulphate, bi-sulphate and sulphide.
87. do thio sulphate.
88. Sulphuric acid.
(except when it is required for captive consumption).
89. Sulphur black.
90. do dioxide gas.
91. do dyes—others.
92. Synthetic rubber (S.B.R. type).
93. Synthetic tops.
94. Textiles made of art silk,
95. Tyres—automobile.
96. Tyres and tubes (bicycles).
97. Vacuum flasks.
98. Vanaspati.
(except expansions of small and medium size units to achieve economic capacity).
99. Vat dyes.
100. Vegetable oil other than cotton seed oil.
101. Viscose filament yarn.
102. Wool tops.
103. Woollen and shoddy yarn.
(except expansion schemes).
104. Woollen worsted cloth.
105. Worsted yarn.
106. Zinc oxide.

* Applications for substantial expansion from existing units as well as applications for setting up of new units in areas, where raw materials resources have remained untapped, would be considered on merits.

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LIST II

AN ILLUSTRATIVE LIST OF INDUSTRIES IN RESPECT OF WHICH APPLICATIONS FOR LICENCES UNDER INDUSTRIES (DEVELOPMENT AND REGULATION) ACT, 1951 WILL BE CONSIDERED **on merits** TILL 31st DECEMBER 1964.

ENGINEERING INDUSTRIES

- | | |
|---|--|
| 1. Agricultural machinery. | 32. H. T. Bolts and nuts. |
| 2. Air rifles. | 33. Hand tools. |
| 3. Aluminium ingots. | (hammers, screw drivers, etc.) |
| 4. Biscuits and bread making machinery. | 34. Heavy earth moving equipment. |
| 5. Beats and crafts. | (except shovels) |
| 6. Boilers. | i. Motorised dumpers. |
| 7. Calculating machines. | ii. Motorised scrapers. |
| 8. Cast iron castings. | iii. Motorised graders. |
| 9. Cement machinery. | 35. Industrial gas plants. |
| 10. Centrifuges. | 36. Industrial sewing machines and and sewing machine parts. |
| 11. Ceramic machinery. | 37. Jute machinery. |
| 12. Chemical and pharmaceutical machinery. | i. Carding engines. |
| 13. Chip board and fibre board plants. | ii. Drawing frames. |
| 14. Cigarette making and tobacco machinery. | iii. H. S. Centrifugal spinning frames. |
| 15. Coal mining and washing machinery. | iv. H. S. High draft drawing frames. |
| 16. Coated abrasives. | v. H. S. High draft second drawing frames. |
| 17. Construction machinery. | vi. Jute machinery and parts. |
| 18. Convoyers. | (including 10 jute silver spinning frames). |
| 19. Dairy machinery. | vii. Self dffing sliver spinning frames. |
| 20. Drilling equipment. | viii. Spinning frames. |
| 21. Dry Cells. | 38. Lifts. |
| 22. Electric furnances. | 39. Light house equipment. |
| 23. Electric lamps. | 40. Machine screws. |
| 24. Electric motors. | (socket head, allen and other specialised types). |
| (above 10 h. p.) | 41. Machine tools. |
| 25. Electrical measuring instruments. | 42. Malleable cast iron castings. |
| 26. Electronic components. | 43. Malleable pipes fittings. |
| 27. Electronic measuring and testing equipment. | 44. Medical surgical instruments, equipment appliances. |
| 28. Fractional horse power meters. | 45. Metallurgical machinery. |
| 29. Grinding media balls and cylpebs. | 46. Oil firing equipment. |
| 30. Grinding wheels. | 47. Oil mill machinery. |
| 31. Hacksaw blades. | |

- | | |
|---|---|
| 48. Oil separators. | 66. Steel structurals. |
| 49. Paper and pulp making plant. | 67. Steel wire mesh. |
| (above 25 tons capacity). | 68. Storage batteries. |
| 50. Picking bands. | 69. Strips cold rolled. |
| 51. Plastic industrial machinery. | (M. S. alloy steel and box strappings). |
| 52. Power factor correction capacitors. | 70. Switchgear and control gear. |
| 53. Power rectifiers. | (below 33 K.V.): |
| 54. Pumps. | (i) H. T. Switchgear. |
| 55. Rayon plants. | (below 33 K. V.). |
| 56. Refrigeration plants for industrial use. | (ii) Iron clad switches and switchfuse units, |
| 57. Rice, dals wheat flour mill machinery. | (iii) L. T. switchgear. |
| 58. Small tools. | (iv) Motor control gear. |
| 59. Soap and cosmetics machinery. | 71. Textile machinery. |
| 60. Speed reduction units. | 72. Tin plates. |
| 61. Steel castings. | 73. Tool bits |
| 62. Steam engines and turbines. | 74. Tractors, harvesters and the like. |
| 63. Steel files. | 75. Transformers. |
| 64. Steel forgings. | 76. Typewriters. |
| 65. Steel pipes and tubes. | 77. Weighing machines. |
| (seamless and expansion is welded to make existing units economic). | 78. Weights and measures. |
| | 79. X-ray equipment. |

NON-ENGINEERING INDUSTRIES

- | | |
|---|---|
| 1. Acetyl chloride. | 14. Chlora sulphonic acid. |
| 2. Activated carbon (only superior grade) | 15. Chocolate. |
| 3. Areated waters | 16. Citric acid. |
| 4. Alcohol—Industrial and power. | 17. Cocoa powder. |
| 5. Amyl acetate. | 18. Copper salts. |
| 6. Antimony. | (excepting copper sulphate). |
| (Expansion cases only). | 19. Cotton seed oil. |
| 7. Asbestos cement sheets and pipes. | (organised sector). |
| 8. Bromine. | 20. Dextrase powder. |
| 9. Canned fruits and fruit products | 21. Essential drugs and pharmaceuticals. |
| 10. Caustic soda and chlorine | 22. Ethyl acetate. |
| 11. Cement. | 23. Ethylene dibromide and ethylene dichloride. |
| 12. Chip board | 24. Fatty acids. |
| (Particle board). | 25. Ferric chloride. |
| 13. Chlorinated paraffin. | |

INSULATING PRODUCTS AND OTHER ARTICLES USING ASBESTOS-MAGNESIA

One of the best known of the many fireproof and heat-insulating asbestos products is magnesia-asbestos pipe covering. This special type of insulation goes by the name of "85% magnesia", a name that obviously indicates that the predominating base consists of magnesium carbonate, which is derived from dolomite, magnesite or bitterns. The asbestos constituent consists of a 15% part of any good-quality fibre. If chrysotile is used, Group 4 class testing from 0.6-6.4 to 0.5-8.3 is specified, while nothing less than an equivalent of Grade "S" crocidolite is used. Longer grades of amosite fibre are eminently suitable for making this product, indeed this variety is superior to all others for this purpose.

The process of manufacture consists simply of mixing the magnesia and asbestos with just enough water to enable the mixture to be easily handled in filter presses. The material is then pressed into blocks or cakes, which are fired out in steam-heated kilns for three days or longer. After drying, trimming includes cutting the blocks into various lengths and width, and in others boring and shaping blocks to cylindrical form to fit the outside of various sized steam pipes on to which they are eventually slipped or fitted in sections at bends. The wall thickness of this type of insulation is usually about 2 to 3 in.

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ROLLERS, RLY. FITTINGS AND P.V.C. MOULDINGS.

- | | |
|--|--|
| 26. Fibre board / hard board,
(including insulation board). | 49. Paints, enamels and varnishes. |
| 27. Fuller's earth. | 50. Penicillin and neutral glass vials. |
| 28. Fuming sulphuric acid. | 51. Plasticisers. |
| 29. Gypsum board. | 52. Polythene films and layflat tubings and
pipes. |
| 30. Glass shells for tubes and lamps. | 53. Potassium chloride. |
| 31. Glazed tiles. | 54. Potassium and sodium ferrocyanide and
sodium cyanide.
(by producers of acrylic plastics only). |
| 32. Glue. | 55. Resins and turpentine. |
| 33. Glycerine. | 56. Soda ash. |
| 34. Grease. | 57. Sodium silico fluoride. |
| 35. High temperature / voltage refractories
excepting insulators. | 58. Solvent extraction of oil cakes/rice bran. |
| 36. Industrial explosives. | 59. Superphosphates. |
| 37. Laboratory glass ware.
(borosilicate type only). | 60. Synthetic detergents. |
| 38. Leather belting. | 61. Synthetic resins. |
| 39. Liquid glucose. | 62. Tartaric acid. |
| 40. Liquid sulphur dioxide. | 63. Tetra chlore ethane. |
| 41. Man-made fibres except viscose tyre yarn
and viscose filament yarn. | 64. Textile auxiliaries. |
| 42. Marine paints. | 65. Urea.
(technical grade). |
| 43. Metallic stearates. | 66. Urea formaldehyde resins.
(for plywoods). |
| 44. Milk powder. | 67. Urea formaldehyde moulding powder. |
| 45. Mixed fertilizers. | 68. Wall boards. |
| 46. Mono chloro acetic acid. | 69. Yeast. |
| 47. Nitrogenous fertilizers. | 70. Zinc sulphate. |
| 48. P.V.C. resins compositions.
(expansion schemes only). | |

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MODERN DEVELOPMENT

ELECTRICITY FROM NATURAL GAS TURBINE

PROVIDES ENERGY FOR HEATING AND
 COOLING SYSTEMS AT REDUCED COST

In scattered locations across the United States, new buildings are springing up which may radically influence design and operation of large structures.

They include a school in Texas, an industrial plant in Ohio, office buildings in Illinois, a shopping centre in Arkansas and a restaurant designed for the 1964-65 New York World's Fair.

These structures have one thing in common ; all energy-including electricity—will come from a natural gas turbine. The turbines are somewhat similar to the jet engines of airplanes.

The variety of uses to which the "total-energy" concept has already been put is an indication of its future acceptance, the American Gas Association claims.

The total-energy concept includes cooling and heating systems, and these buildings will not require power lines strung through the air to utility poles. Many of them will be windowless, since operating economies will permit high lighting, levels and complete environment control. For the same reason, interior rooms will be possible, cutting down construction costs.

The total-energy gas turbine system, will be highly efficient, its advocates claim. Gas turbine efficiency, normally between 12 to 25

per cent, is said to reach 60 to 70 per cent in the total-energy system.

The newest announced entry into this special group of buildings is the Lexington, Ohio, plant of the Hartman Electrical Manufacturing Company. This plant is a typical example of the total-energy application. From heating to cooling it will depend on turbines powered by natural gas.

Two turbine engines will operate together or independently in the Hartman plant to drive 420-cycle generators, furnishing the building's lighting and power for machinery, spot welders and ovens. A 60-cycle motor generator will supply power for office machinery and equipment in the building. The normally wasted exhaust of the turbines will be captured by an exhaust heat boiler which will generate steam or supply hot water for heating and steam absorption cooling.

Hartman's plant will be windowless in order to maintain a dust-free controlled manufacturing environment for the production of tightly sealed dry circuit relays. The designers say an advantage in windowless buildings is that heat loss is reduced in winter and heat gain in the summer.

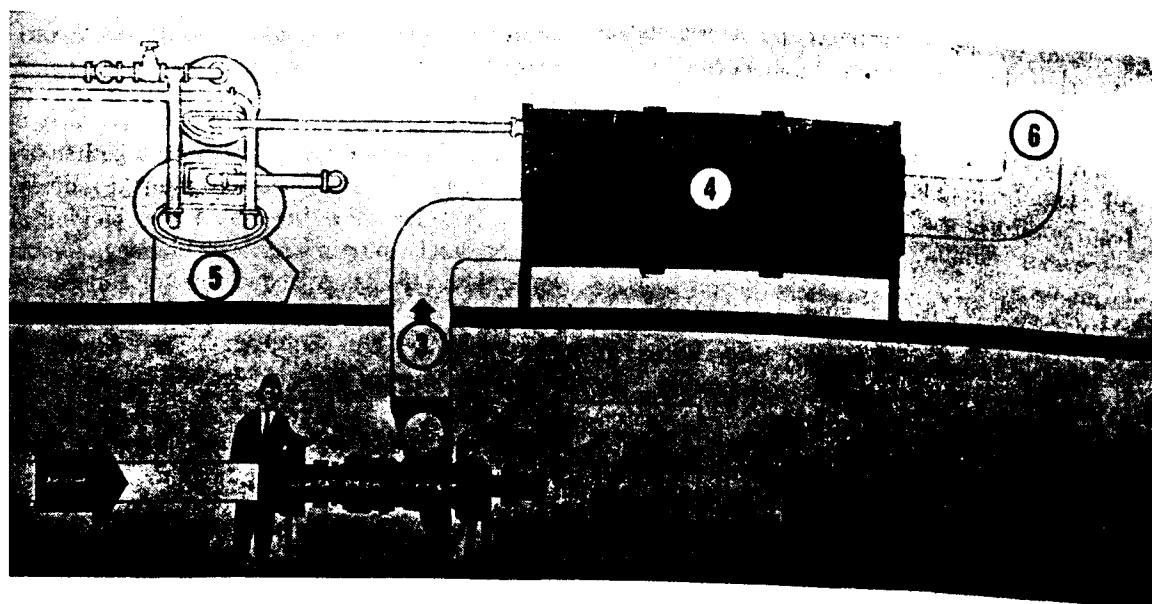
In a secondary school building under construction in McAllen, Texas, air conditioning was a major consideration since McAllen has

hot weather much of the year. Windowless walls plus the gas turbine proved the most economical solution. In addition, the school's architect said eliminating outside light and ventilation decreased construction costs.

The Northern Illinois Gas Company is erecting two office buildings which will use turbines. The company's general office building near Aurora will be used as a "pilot" on which similar structures can be modeled. It will be finished in 1963. The company's new headquarters in Glen Ellyn, which will soon open, also has a total-energy gas turbine.

Park Plaza Shopping Center in Little Rock, Arkansas, is the pioneer of the total-energy gas turbine concept. The turbine supplies energy needs of some 30 business establishments, including a supermarket, bowling alley and department store. The system has been in operation for more than a year. The owners say power costs are 30 to 40 per cent lower than the cost of purchased power.

The New York World's Fair has a 250-seat restaurant in the gas industry's "Festival of Flame" exhibit building which will use a gas turbine energy package to provide all heating, cooling and lighting.



This chart depicts a new system of heating, cooling and lighting a building. The gas turbine engine (1) powered by natural gas uses its shaft power to turn the generator (2) to provide electricity. The engine's exhaust heat goes through the stack (3) to the boiler (4) where the exhaust is used to generate steam for heating and absorption air conditioning. At right (6) is an exhaust outlet.

MINERAL BASED INDUSTRY

ON SOME POSSIBLE MINERAL BASED INDUSTRIES IN THE MADRAS STATE

(BY S. KRISHNASWAMY)

Madras State happens to be the foremost producer of magnesite and lignite, the second largest producer of salt and gypsum and the fourth largest producer of limestone in India according to the 1962 figures for mineral production. In addition, we are also producing in this State small quantities of fireclays, quartz and silica and felspar and negligible quantities of bauxite, crude mica, corundum, garnet sands, phosphatic nodules and iron ores. Recent work by geologists in this State has also established the presence of such minerals as Apatite, Tremolite-asbestos, Barytes, Beryl, Chromite, Columbite-tantalite, Cordierite, Gemstones, Gold, Graphite, Ochres, Natural Gas, Peat, Reh salts, Sulphides, Soapstone and Thorium.

Now in this paper, I shall not be dealing with the uses to which our minerals are already being put to, but suggest, some new ones for them. These suggestions are entirely my own and do not necessarily represent the official views of the Geological Survey of India.

Salt: So far as salt is concerned, a number of chemicals are being manufactured in this State based on salt but no attempts have been made so far to utilise and extract magnesium and its salts which are left over in the sea water after the extraction of salt.

Limestones: As regards limestones, out of the large reserves of crystalline and other varieties of limestones known to occur in this

State, about 25 to 30 per cent of them may not be suitable either for the manufacture of Cement or of Chemicals. Such impure limestones, need not be discarded and can be best utilised for the manufacture of the thermal and sound insulation product known as "Rock Wool" or "Mineral Wool". Fortunately for its manufacture a wide variety of mixtures of raw materials could be utilised. But generally dolomite and fireclays or dolomitic limestones, alumina-rich clays and fluorspar, or calcite and quartz or even calcareous or dolomitic sandstones and shales are being utilised for its manufacture.

So far the shell and coral limestones found in the Gulf of Manaar and Palk Straits, which

are of great purity have not been adequately utilised for the manufacture of chemicals.

Magnesite : For some years past, magnesite used to be exported in the raw state, but recently a small production of refractory bricks has been reported. But so far no serious attempt has been made to utilise this mineral, for the extraction of the metal Magnesium, which like Titanium has a great future. Magnesium can be manufactured either from Magnesite, Dolomite or even from sea-water or natural brines. While we are definite about our resources in Magnesite we have no correct picture of our dolomite resources. From magnesite magnesium can be made by the well-known Pidgeon process. The Dow Chemical Co. in America has evolved a process for extracting this metal from sea-water or natural brines. The importance of utilising the sea for this purpose could be easily gauged if only it is recalled that every cubic mile of sea-water contains about 4 million tons of magnesium. It is well-known that with aluminium, magnesium is indispensable in the construction of aeroplanes. Because of the relatively cheaper cost of casting articles from magnesium than from any other known common metal, in the future magnesium is likely to complete with zinc, aluminium, copper and brass in the production of such articles as hardware, building trim and lighting fixtures. It is also much used in the defence industries for the manufacture of tracer bullets, incendiary bombs etc. In addition, I feel that it is high time that we utilise our magnesite also for the manufacture of the well known thermal insulation compound, known popularly as "85% magnesia composition". The process of manufacture of 85% magnesia composition is fairly simple and since so far in India only 2 or 3 companies are manufacturing only small quantities and the major part of our consumption of this product, is met by imports, it is suggested that entrepreneurs in this State

should seriously consider the manufacture of this compound. It is made as follows:—

The dolomite is mixed with coke and calcined in a furnace, and the calcined dolomite is slaked and suspended in water and recarbonated under pressure. The calcium carbonate is then filtered off and the solution remaining is boiled to yield the white basic compound known by the trade name of "85% magnesia". Actually the thermal insulating cement which is used for thermal insulation requires about 10% to 15% of asbestos to be added to the basic hydrated magnesium carbonate. Economically workable deposits of chrysotile asbestos had not been located as yet in this State but since we actually require only a small amount of short grade spinning fibre of chrysotile asbestos it can be either obtained from the Cuddapah district or from the Mavinhalli-Gopalpura area about 10 miles south of Mysore City.

Petroleum : In view of the fact that an oil refinery is a pressing necessity in this State and since there are fair prospects of locating resources of petroleum in the off-shore regions of Karaikal, Tanjore, and Ramanathapuram areas, there is also a strong case for establishing a Petro-chemicals industry in this State especially utilising the available surplus of Naptha in this country. The manufacture of fertilisers and of petroleum coke would be useful.

Clays : Though the white clays available in this State are being utilised to some extent, the bleaching clays found in some abundance within a 30-mile radius of Madras City near the villages of the Ambattur, Kilacheri, Koppur and Mappedu, all of them lying in the Chingleput District have not been utilised at all. Being somewhat bentonitic in character, they could be utilised both in the mineral oil industry as well as in the vegetable oil

Quartz and Silica : It is well known that fairly important reefs and veins of quartz occur in the districts of Tiruchirapalli, Salem, Coimbatore, Madurai and Tirunelveli and in addition we have the quartz reefs bearing auriferous pyrites in the Wynaad area of the Nilgris district, as well as the Quartzitic sandstones of Upper Gondwana age in parts of the Chingleput, North Arcot, Tiruchirapalli and Ramanathapuram districts. Our resources in silica could best be utilised for the manufacture of sodium silicate (so necessary in the manufacture of soap as well as in the special types of glasses), silica gel and silicon carbide or what is better known as carborundum. Carborundum is made by fusing a mixture of coke, sand and saw-dust. A good quality quartz-sand is required for this purpose and coke would have to be imported from Bengal or Bihar.

ware. Since this State is known to possess China clay, quartz, and gypsum in addition to felspar serious attention should be given to the setting up of a medium sized laboratory porcelainware industry in this State. All that is required is that the China clay should be properly washed, thoroughly purified and then powdered, but the other raw materials for this manufacture do not need any special or expensive treatment but they would have to be finely powdered.

Bauxite : Bauxite is known to occur in fairly large quantities in the Shevaroy hills near Yercaud in the Salem district but other occurrences are known from near Kotagiri in the Nilgris and between Berijam and the Kerala border in the Palni hills in the Madurai district but their true potentialities have not been properly assessed as yet. In addition to the production of the metal aluminium, some of them could also be utilised for the manufacture of abrasives like "alurox", which is being done near Yercaud.

Feldspars : The feldspars we mine are being used mainly for the glazing of ceramic

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between Kotagiri and Coonoor in the Nilgiris district and the possible north-westward and northern extension of these deposits should be explored. But even as it is the large reserves of magnetite ores known to exist in this State can sustain a medium sized iron and steel plant of, say half a million ton capacity in this State, using lignite as the fuel for converting the magnetite ore into pig iron and then electrical energy for the manufacture of steel. But as large quantities of water are required for the manufacture of iron and steel from the magnetite ores and since electric smelting methods are to be preferred for the manufacture of steel, this plant should preferably be located where both firm power and adequate water supply are available the year round and to my mind the best location for this would be Mettur.

Gold : Gold ores are known to occur in parts of the Krishnagiri Taluk in Salem District bordering the Kolar Gold Fields, in the Satyamangalam taluk in North Coimbatore District bordering the Kollegal taluk (now in Mysore State) and in association with iron and copper pyrites in the Wynad area in the Gudalur taluk of the Nilgiris district. Preliminary investigations had already been carried out by the Geological Survey of India in the Krishnagiri taluk of Salem District and they are under way in the Wynad area but the Satyamangalam occurrences will be investigated only in the Fourth Plan period if not earlier. The uses of gold are well known.

Beryl and gemstones of the Beryl family : In addition to the Beryl deposits in the districts of Salem and Coimbatore, aquamarines had been recorded from near Padiyur in the Coimbatore district and both emeralds and aquamarines are known to occur sporadically around Palaiyamkottai, Mullipuram, Papini and Kavalakkattuvalasu villages in the Kangayam area of Coimbatore District. Aquamarines had also been reported to occur

sporadically near Salapatti opposite to Patachavantana R. S. on the Tiruchirapalli-Erode line and near Kiranur, Odaipatti, and Ellammankovilpetty in the Kadavur Zamindari in Kulitalai taluk of Tiruchirapalli District.

Cordierite : The pale blue transparent variety of this stone which can be utilised for the manufacture of cheap jewellery occurs in a few places in the Kadavur Zamindari in the Tiruchirapalli District especially near Kiranur, Odayapatti and Ellamman Kovilpatti and also near Ganguwarpatti at the foot of the Kodaikanal hills in the Madurai District.

Ochres : The yellow and red earths found in the Senkirai R. F. and near Arimalam and Tiruvarangulam near Pudukottai as well as the large deposits of red iron stones and yellow shales (clays) found associated with the Upper Gondwana rocks in the Sivaganga area in Ramanathapuram District could be utilised as ochres and the soft iron stones could better be utilised in the paint industry.

Natural Gas : Occurrences of natural gas had been recorded by the Geological Survey of India from the following localities:

- (a) Near Neppattur, about 7 miles east of Sirkali (Tanjore District.)
- (b) Near Avadi (Chingleput district)
- (c) In Virugambakkam near Kodambakkam, a suburb of Madras City.

The third occurrence had been found to be of no economic importance but the economic importance of the other two occurrences had not as yet been established after a proper and thorough investigation. Natural gas can be used either for burning purposes or if found in large enough quantities can be condensed to yield petrol etc.

Peat : The several peat bogs found in the Nilgiris have not been studied in detail regarding their available reserves. This peat studied in detail regarding their available reserves. This peat can be used locally as a fuel.

Reh Salts : Reh salt which is natural occurring impure variety of washing soda is known in tamil as 'Oovarman'. It occurs as an efflorescence on the soils in the Tiruchengode and Dharmapuri taluks of Salem District, Perambalur taluk of Tiruchirapalli District and in a number of localities like Tiruvannur, Kadaganur, Asanur, Kavanai, Kulapakkam and between Kachchirapalayam and Madhavacheri villages in the South Arcot District. So far except in the case of the South Arcot occurrences no special investigations have been conducted by the Geological Survey of India to assess the available resources of such salt in this State. At present a small amount of reh salt is being collected locally by washermen for washing clothes. Since it is a potential source of soda ash and other alkalis, a special probe to assess our resources of reh-salts is required. Now brines are being extensively used for the manufacture of soda ash and the reh-salts, if available in large quantities, could serve also as a supplementary raw material for soda ash production.

Sulphides : Sulphur-enriched earths and soils are known to occur on the banks of the Manimuthar canal near Tiruvattampatti about 5 miles almost due south of Sermadevi (Cheranmahadevi) in the Tirunelveli District. The reserves are not known. In addition, pyrrhotite is known to occur both near Thaniar in the North Arcot district and near Odiyandal and between Toluvanthangal and Pakkam in the South Arcot District, in parts of the Salem, Coimbatore and Tirunelveli districts and in the Wynad area of the Nilgiris. In the last named area the gold is associated with the sulphides and if the copper, and sulphur could be obtained as a by-product while working for gold, then the cost of gold production here would be considerably reduced.

Talc and Soapstone : We have some occurrences of soapstone recorded from parts of Salem, Coimbatore and Tiruchirapalli districts. This is now being utilised mainly for making toys, utensils etc., but the possibility of their utilisation for the manufacture of the special type of insulators should be investigated.

Ilmenite : It is well known that it is the principal source of titanium dioxide, a useful white pigment, and of the metal titanium. Metallic titanium forms a number of useful alloys with iron and both the metal and its alloys are very highly resistant to corrosion and as such they are especially useful in the manufacture of naval craft, jet engines and fighter air-craft etc. Titanium dioxide is also now being used for the manufacture of synthetic white brilliant stones. In addition to the beach sands in which ilmenite occurs along with a number of rare minerals in the coastal tracts of Tanjore, Ramanathapuram and Tirunelveli Districts, both ilmenite and titaniferous magnetites are known to occur in the Kadavur Zamindari in the Kulitalai taluk of Tiruchirapalli District.

Apatite : Recently the Geologists of the State Geological Department had recorded the presence of apatite near Kottagudi about 10 miles WNW of Bodinaikkanur. A proper survey of this region is necessary to locate other possible sources of this useful mineral. If it is found in large quantities then it could be utilised along with the resources of phosphatic nodules (which occur in the Karai-Kambakurichi) area in the Perambalur taluk of Tiruchirapalli District as well as near Valudavur in the South Arcot District) for the manufacture of elemental phosphorous and phosphoric acid. Along with the feldspars, apatite can be processed to yield a useful fertiliser. The apatite of Kottagudi is rich in fluorine and as such the possibility of utilising them for the manufacture of synthetic cryolite which is an indispensable additive for the extraction of aluminium in aluminium smelters should be explored. Apatite can give rise to

calcium metaphosphate, a useful fertiliser and in this reaction HF is released which latter can be reacted with aluminium hydroxide and soda to give rise to synthetic cryolite. The commercial feasibility, of such a process should be examined.

Building Stones : In this State, we have large resources of good building stones. The grey and pink granites when well polished yield excellent and durable building stones. Between Melur and Tirupathur on the road to Karaikudi, an exceedingly beautiful white granite is being quarried and used extensively for building purposes locally. It would be worthwhile to establish a proper and large scale building stone industry in this State.

Ultrabasic rocks : A detailed examination of the ultrabasic rocks found in this State especially in the Salem District should be made to locate any possible sources of nickel and chrysotile asbestos.

In conclusion, it has to be emphasised that since minerals are wasting assets they should be mined strictly on scientific lines and then put to the best possible use. Further it would be most advantageous if the mineral are manufactured into useful articles and then exported. Since only a handful of persons had so far been interested in mining minerals in this State, it will be useful if a Mineral Utilisation Cell is formed in the State Geological Department to educate, advise and assist the new, keen entrepreneurs about the true potentialities of new prospects and provide where necessary the Technical know-how regarding proper mining or quarrying methods as well as about beneficiation of ores. In due course a State Mining Development Corporation may be felt necessary.

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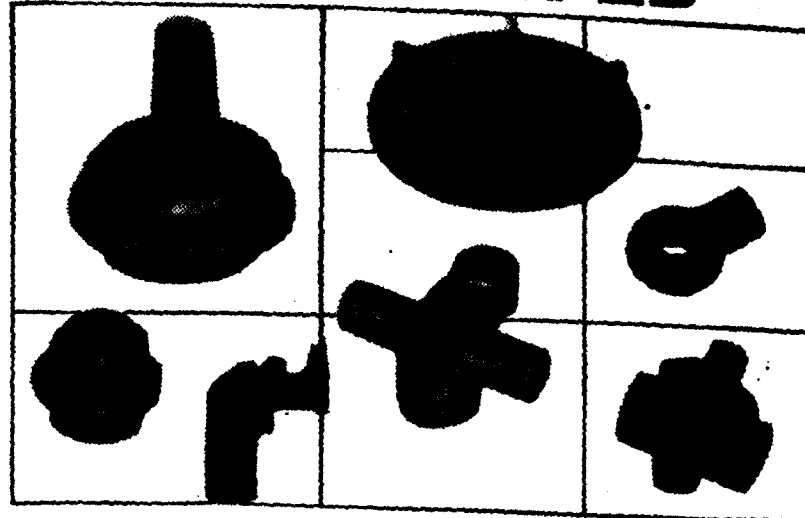
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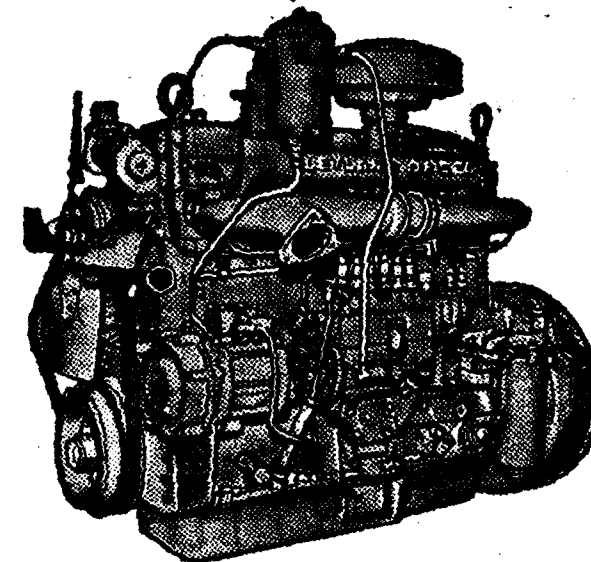
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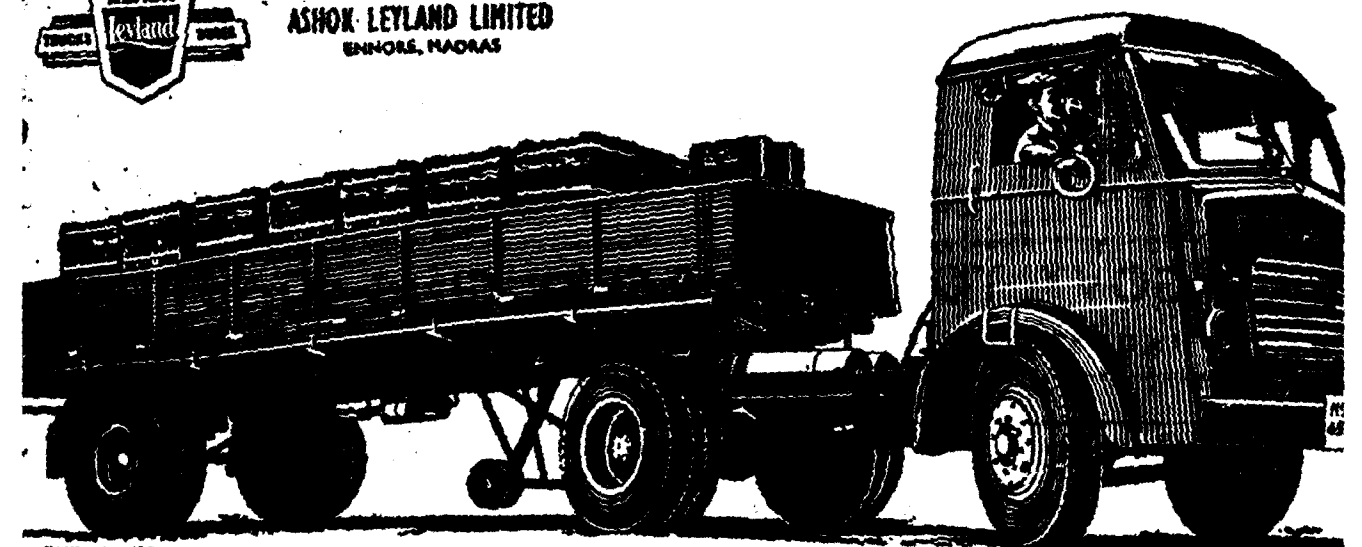
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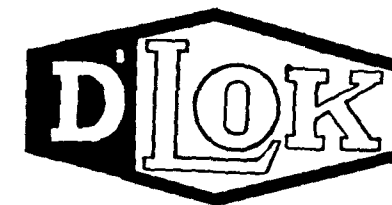
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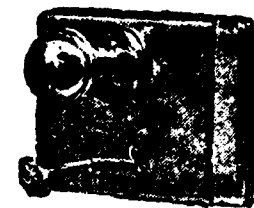


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