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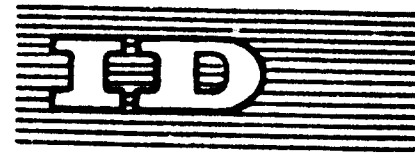
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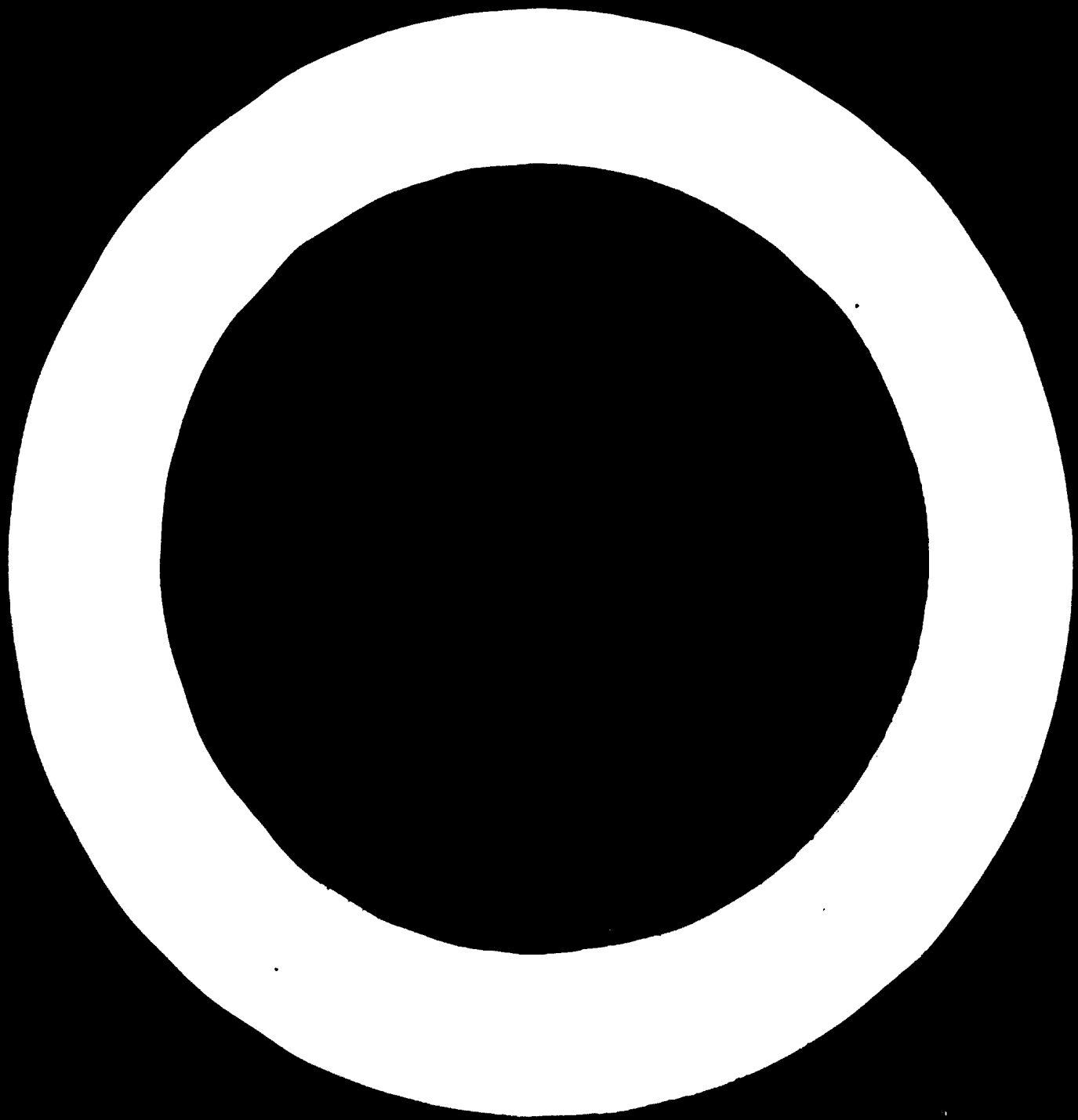
Seminar on Furniture and other
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THE WOOD PROCESSING INDUSTRIES IN THAILAND^{1/}

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Most of forest in Thailand is tropical rain forests which consist of many species of trees in ecology. These species of tree are different in type, size and quality. It is estimated that there are approximately 2,000 species of tree growing in the forests of Thailand. Formerly, the selective felling system was specific on the commercial species, the secondary and off-grade species were left standing; but in the present time the volume of commercial species of tree decreased year by year that made the secondary species of wood have more importance in wood utilization both in lumbering and secondary wood processing industries.

The utilization of logs in logging and sawing is not high. Generally, we can get approximately 45 - 55 per cent yield at the primary forest products utilization; about 50 - 55 per cent being wood residue which come from:

1. Logging and silviculture practice such as broken sections and short logs, cull logs and stumps;
2. Sawmill wastes such as slabs, edgings, trimming and cut offs, miscuts, cull pieces and saw-dust;
3. Veneer and plywood manufacture such as veneer peeler-cores, residual flitches, other clippings and other waste veneer;
4. Other wood using industries such as match factory residue, wood working and furniture factory residue;
5. Seasoning and remanufacture wastes such as kiln rejects, off-cuts, planer shaving, etc.

At the present moment we do not know Thailand's exact volume of wood residue which comes from various sources mentioned above, however, it can be estimated that rather all of wood residue comes from:

1. Sawmill and logging about 50 per cent;
2. Plywood and veneer manufacture about 15 per cent;
3. Other wood using industries, dry kiln and impregnation plants about 5 per cent.

Although our wood processing industries are not very modern, we are able to produce plywood, particle boards, fiber board, chip board and wood-wool cement boards to support the demand in our country adequately.

In Thailand the wood-based material manufactures are qualified as follow:

1. Plywood and veneer industries: There are two factories: Thai Plywood Factory Co. Ltd. and Bangkok Plywood Factory Co. Ltd. which produce plywood and veneer.

Thai Plywood Factory is the government factory set up in 1957. The main point of this factory is to utilize the logs of various species, sizes and qualities from natural forest and forest concession owned by this factory. It is an integrated industry for it combines the saw-mill, veneer-factory, plywood factory, flush door, factory and block board factory together; then it is so called the "Thai Plywood Factory Co. Ltd." The original capital of this factory is about 4 US million dollars. The first year production is about 410 pieces of plywood (4'x 8') per day and increased year by year as shown in the following data:

<u>Year</u>	<u>Pieces/day</u>	<u>Pieces/year</u>	<u>m³</u>
1958	906	289,096	3,862.28
1959	2,020	591,724	8,084.23
1960	2 2,739	830,143	10,469.88
1971	3,013	901,242	12,422.00
1962	3,892	1,159,756	15,815.75
1963	4,583	1,361,133	18,385.64
1964	5,671	1,707,017	23,828.00
1965	5,870	1,743,569	25,653.00
1970	8,000	-	-

From the above data showing that the production capacity increased 25 per cent each year and the waste of wood residue from this factory was about 100 tons per day in 1970.

Bangkok Plywood Factory Co. Ltd. has started production in the recent year. No data is available yet.

2. Particle board industries: There are two factories which produce particle boards

(a) Srimaharaja Co. Ltd. is a private factory which received the licence from the government to produce particle board in 1955. The production process is the Behr System for Flat-platen pressed particle board. These particle boards are called "Shaving Board" as their trade name. Its production capacity is about 25 tons per day.

The data of production is shown below:

Year	<u>Production</u>	
	cubic meter	metric ton
1958	2,248	1,461
1959	6,142	3,995
1960	8,415	5,470
1961	6,663	4,331
1962	5,587	3,632
1963	6,528	4,243
1964	4,785	3,110
1965	7,742	1,782

This factory uses raw material from secondary species and wood residue from saw mill or lumbering industries.

(b) Thai Chip-board Factory Co. Ltd. is also a private factory which has been set up recently. Its production capacity is about 60 tons per day which is larger than the Srimaharaja Co. Ltd. It uses the German Okal production process to produce extruded boards. Raw materials are obtained from saw-mill or lumbering industries. The trade name for the extruded particle board produced is "Chip board".

3. Fiberboard industries: As the wood residue from plywood and veneer manufacture of Thai Plywood Factory Co. Ltd. totalled about 100 tons a day in 1970, therefore, the Thai Plywood Factory Co. Ltd. decided to set up another factory recently to produce fiberboard from these wood residue by using the Swedish Asplund wet process. The fibreboard obtained is smooth one side. This factory is a medium size factory with production capacity about 80 tons per 24 hours which covers only domestic sales.

Another fibreboard factory was set up at Srimaharaja Co. Ltd. in order to utilise wood residue from saw-mill or lumbering industries and non-commercial or off-grade timber species in the forest concession. It uses a Dry Process from U.S.A. and produces smooth two sides fibreboards. Its production capacity is about 60 tons per 24 hours.

4. Wood wool board and "Bond Wood" industries: The wood wool board industry was introduced in Thailand by a private factory in 1957. The machines used in the factory were purchased from Japan and follow Japanese method of production. However, there are many problems involving raw materials. The production

capacity of this factory is as follows:

Year	Pieces	M ³	Metric ton
1957	45,000	1,143	720
1958	62,000	1,575	992
1959	79,000	2,007	1,264
1960	65,000	1,651	1,040
1961	60,000	1,524	960
1962	80,000	2,032	1,280
1963	85,000	2,159	1,360
1964	95,000	2,413	1,520
1965	90,000	2,286	1,440

Size of piece: 1 meter x 2 meters x $\frac{1}{2}$ inch.

The "Bond wood" industry in Thailand has just been introduced this year by the Government Forest Industry Organization. Raw material used is the small size of teak timber out from thinning in the teak forest plantation. A private factory is considering to set up a medium size factory for producing Bond wood, consequently in the near future there will be two factories for this purpose in Thailand.

5. Furniture industry: The furniture industry uses saw wood and wood based panels as raw material.

From a short survey by officials of Royal Forest Department covering 17 different furniture firms in Bangkok and Thorburi indicated that 15 of them buy sawn wood directly from the saw-mill and two of them buy from lumber-dealers.

The use of raw materials:

1. Sawn woods used are teak, Yan (*Dipterocarpus* sp.), Takein (*Hopea* sp.), Krabark (*Anisoptera* sp.), Tabak (*Lagerstroemia calyculata*) and other.

2. The size of firms were classified by quantity of labour employed into five groups as follows:

Group 1	5 - 9 persons employed
Group 2	10 - 19 persons employed
Group 3	20 - 49 persons employed
Group 4	50 - 99 persons employed
Group 5	above 100 persons employed

Use of sawn wood according to size of factory:

<u>Group</u>	<u>Species</u>	<u>m³/year</u>
1	Yang	2
	Teak	615,7
	Afzelia	3.1
	Tabak	150
	Takein	350
	Other	7.4
2	Teak	60
	Krabark	12
	Yang	54
	Other	118
3	Teak	750
	Afzelia	190
	Other	329
4	Teak	1,641.6
	Other	233.3
5.	Teak	1,800
	Other	144

Price per cubic meter

Yang	50 US \$
Teak	115, 125, 150, 175 and 225 US \$ (depend on its quality)
Afzelia	75, and 135 US \$
Tabak	60 US \$
Takein	75 US \$
Krabark	45 US \$
Other:	Other: 60, 62.5, 65, 70, 75, 80 US \$

Preserved wood is not available.

USE of plywoods: 4' x 8' in all thicknesses:

<u>Group</u>	<u>m²/year</u>	<u>price/m²</u>
1	3,155.2	.75
2	11,919	1
3	14,645	2.1
4	8,120	.50
5	3,190	.40

<u>Group</u>	<u>m²/year</u>	<u>price/m²</u>
USE of wood-wool board		
Only group 3	145	2
USE of fibreboard		
Group 2	580	.75
Group 3	29	2.2

Problems of secondary wood processing in Thailand

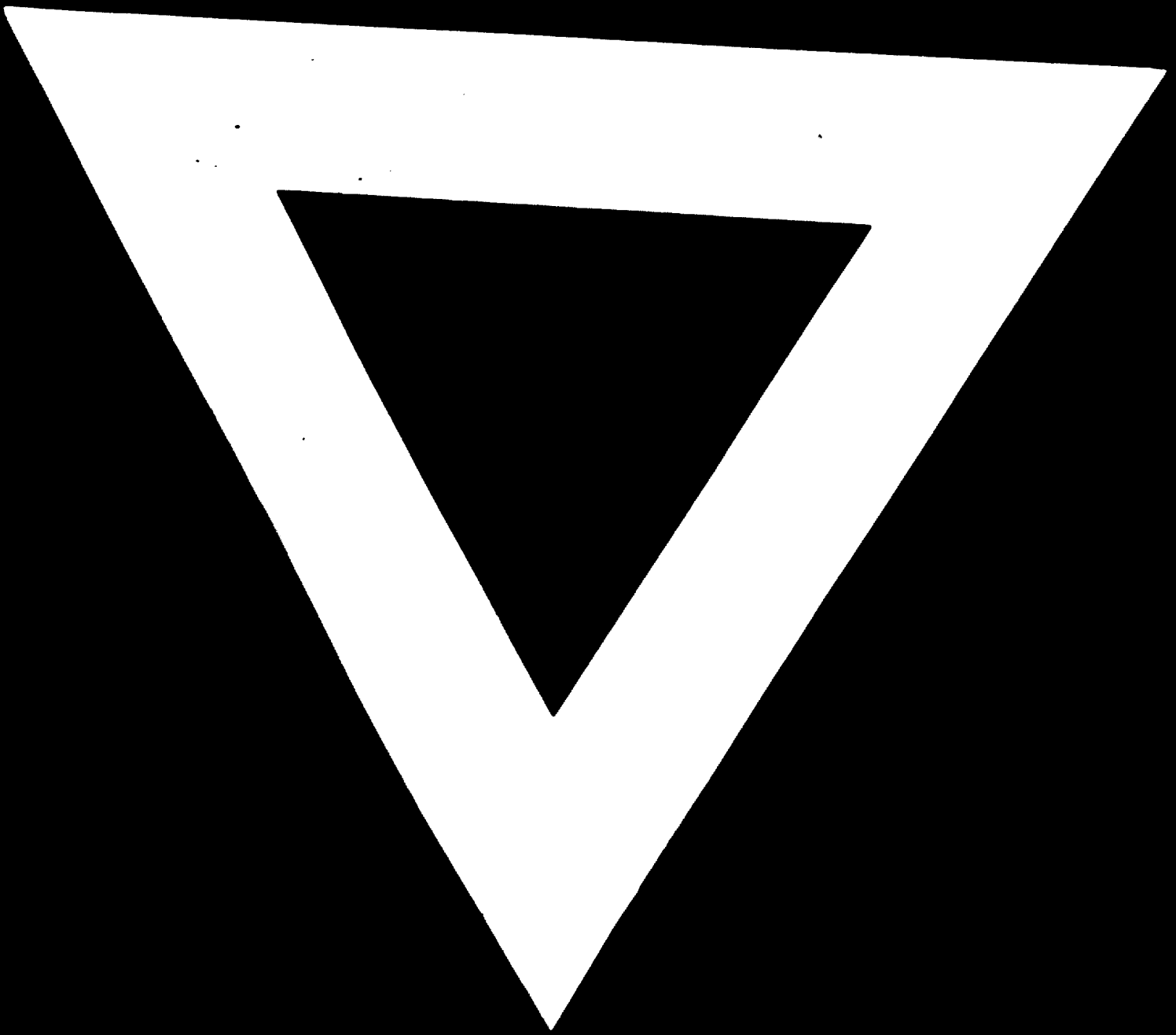
There are four important factors causing problems of secondary wood processing in Thailand which should be considered as follows:

1. Marketing. It is sure that in the near future the production of the various secondary wood processing industries in Thailand will cover the domestic needs of the country adequately and marketing problems would be created when the production will exceed the local demand, as export markets will have to be created.
2. Adhesives are important to the wood processing industries in general and to the wood based panel industry in particular. We have to import a large amount of adhesive each year, that cost considerable foreign exchange so we are considering to produce good quality adhesive in the country.
3. Timber species. The forests in Thailand consists of over 2,000 species of timber, the proper selection of timber in each industry will lead to more economical use. Consequently we will have to undertake research on the most promising species of timber.
4. Quality control. At the present time, the quality control has not been studied yet. It is not appropriate to copy quality control procedures from practices elsewhere since our timber is very different from that of other countries.

Future trends of production and utilization of wood processing industries in Thailand: These will increase year by year as shown in the above data of production capacity of Thai Plywood Factory Co. Ltd. and Srimaharaja Co. Ltd.

A limiting factor will be the damage, caused to the forests in Thailand, leading to a rapid decrease of the stock of timber species. The increase in yields of wood processing industries will be more important in every field especially in wood furniture industry which is one of the major timber users.





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