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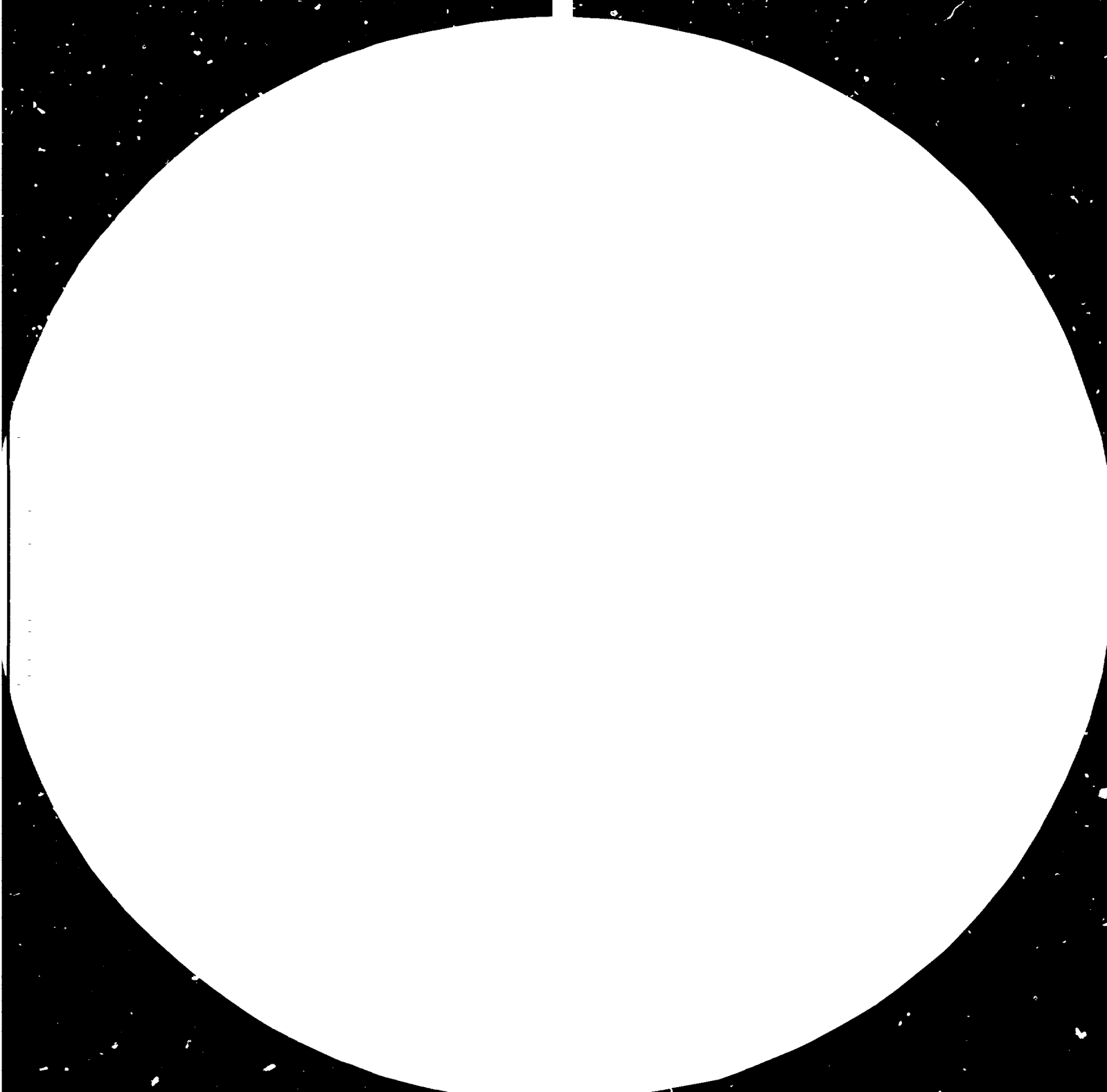
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PRIMARY WOOD PROCESSING INDUSTRIES IN BRAZIL*

by

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Introduction

In the beginning of this century Brazil was an importer of all kinds of forest products with the exception of such items as those not needing to be processed. Until just lately it was possible to see old building components of Pinus sylvestrius L. in the form of beams, doors frames, floors and so on (in parts of this country one can still see these). Brazil has an area of 8.500.000 square kilometres and formerly some 65 per cent of this land was forest. The type of forest depended on, of course, the altitude, latitude, and other conditions and the types were many. As this paper is not intended to describe the botanical subjects, however, we will deal only with that relating to the wood industry directly. Taking this point of view the following forest regions are of special interest: a) Parana Pine Forest; b) Atlantic Forest; and the c) Tropical or Amazonian Forest.

It is the Parana Pine forest that occupied large areas in the high lands of the three southern states of Paraná, Santa Catarina and Rio Grande do Sul. As the name says the more important tree of the Parana Pine forest is the Parana Pine "Araucaria Angustifolia". Under the dominant store of Araucaria exist lots of species of hard woods in which the most important is the "Imbuia" (Phoebe porosa), a specie of wood more utilized in furniture in Brazil than in anything else until now. Other species are the "Canelas" of the genus ocotea, that have been used in packaging, low-cost furniture pallets, etc. This forest is almost completely depleted by the sawmillers, plywood makers, and by the paper industry. The state of Paraná originally had about 10,000.000 hectares of Parana pine forest. In 1963 there were only 1,567.000 hectares and then in 1978 only 316.000 hectares. Obviously the forest was mismanaged in this area and one can find the same in other states.

The Atlantic forest, a sub-tropical forest covering a strip of land of some 200 kilometres in width resting on the coast. Here one can find trees of 20 to 25 metres high. Some of Brazil's finest wood species thrive in this odd mixture of soil and climate ("odd" because of

the high altitude). In the southern part of this area the "Canelas" (Ocotea spp.) and (Nectandra spp.) are the most popular groups, in the fertile soil of Paraná and the state of Sao Paulo (20° to 25° L south) the dominant trees are "Peroba" (Aspidosperma polyneuron), "Ipê" (Tabebuia spp.). "Cedro" (Cedrela spp.), "Caviúna" (Dalbergia spp.) "Jacarandá" (Dalbergia nigra) and many others. This forest covered at one time about 10 million hectares and is now reduced to only 3 or 6 per cent of that amount. Almost all of the land here had practical topography and so was deforested for agricultural use and pasture land.

The Brazilian Amazon forest covers about 280 million hectares. This forest is considered the last large forest resource of the country and in its major area is a good example of the typical tropical rain forest, characterized by a large number of species in each hectare (the composition of the soil varying depending upon climate, topography and other factors). The most well known species of this area are the "Mahogany" (Swietenia macrophylla), which can be found in the southern boarder of the Amazonian region, (Virola surinamensis), "Andiroba" (Carapa spp.), "Sucupira" (Bowdichia spp.), "Jatobá" (Hymenaea spp.), etc. According to a survey made through satellite imagery, this forest has about 7.7 million hectares of deforested area mainly of pasture and agricultural attempts. This figure does not include, however, the areas that in spite of dense forest were almost completely depleted of the more valuable species (i.e. Mahogany in its favourite region).

Reforestation and afforestation are managed mainly in the states of the Southern Central area and are regulated according to laws that give tax incentives to persons and companies interested in making use of the country's forests (this programme has been in existence since 1966). Since that time about 3 million hectares (50 per cent Eucalyptus and 35 per cent of Pine and the balance taken up by a number of species) including some Araucaria in the south were planted.

Importance of the Sector

The primary wood processing industry is a very important part of the national economy. Its participation in the Gross National Product is about 6 per cent.

According to data from 1978, the production of the sector was the following:

Sawn timber	7,500.000 m ³
Sleepers	460,000 m ³
Plywood and veneer	912,000 m ³
Particleboard	500,000 m ³
Fibreboard	650,000 m ³

According to the magazine "World Wood" (July 1980) Brazil ranked sixth in the world in Roundwood production and seventh for Sawnwood production. We were placed third in plywood production and twentieth in the production of particleboard. For veneer and sheet production we placed eighth.

In 1978 Brazil exported some 110,000 m³ of sawn timber, 26,500 m³ of veneer and some 156,416 m³ of fibreboard.

Products Manufactured

- 1) Sawn Timber: The sawn timber industry is the most widespread fraction of the wood sector. Each state in the country has sawmills some having many and others only a very few. The state of Paraná was at one time the great producer of sawnwood both for softwood and for hardwood. Now, however, the production is increasing to such an extent in the Amazonian region and also in the state of Pará that less and less is being produced in Paraná. Pará, in fact, has a production of 2.6 million cubic metres per year and is probably the greatest producer at present. There is little information about the sawmills of Brazil because with the shift of production moving to the Amazonian region sawmills in other areas are fast becoming abandoned.

Sawnwood in Brazil is used for building, furniture, packaging, boat building and for other things as well but, again, we have no proper statistics on this at this time.

- 2) Plywood: The south was previously the only producer of plywood (some 10 years ago) and that produced was usually of Parana pine. Today there are plywood mills in the Southeast, the Western Central

area, and in the Amazonian region. Because of the forest depletion in the south some companies are bringing logs from the Amazon region to be processed in the south. There is a general decline in the tendency of production in the south, as mentioned before, as production has shifted to the north and north-west areas. Plywood in Brazil is basically used in furniture manufacturing and for concrete forms in multi-storied building, concrete bridges and other concrete structures.

- 3) Particleboard: There are 14 particleboard plants in Brazil with an annual production of about 500,000 cubic metres, used exclusively in the country. The raw materials are basically the leftovers from reforestation. Particleboard is used in furniture manufacturing.
- 4) Fibreboard: There are two companies with three fibreboard plants processing exclusively Eucalyptus (at 5 to 7 year old trees). Fibreboard is used in low-cost furniture, wall panelling of internal walls, crates, boxes, etc. The annual production is about 650,000 cubic metres of which 160,000 cubic metres are exported.

Equipment

Sawmilling

A typical sawmill for log break-down of old growth timber is performed by a bandsaw, one or two single-saw edgers and one or two single cut-off trim saws. The band headrig has 1.25 to 1.50 metres wheel diameter, powered with an electric motor of 60 to 120 HP. The carriage is powered by the flywheel or by a separate electrical motor, the setworks and the dogs are manually operated, a log turner electrically powered the circular edgers are powered by 10 - 20 HP, while the feeding of sawn lumber is done manually. Cut-off saws are manually operated and powered by 3 - 5 HP electric motors. The daily production of such a mill varies from 10 to 30 cubic metres per day and operated by some 20 to 50 workers.

Horizontal frame saws are still used in many saw mills although they make for low production (they are low-priced as well).

Mills having the advantage of more capital to invest are beginning to use mechanical operated devices to carry pieces of lumber from one saw to another and systems of waste disposal are being installed in nearly every saw mill new and old.

For the conversion of small-size reforestation logs, scrag mills and twin band mills are installed.

All of the equipment mentioned in this paper is made somewhere in Brazil. We also manufacture band headrigs of up to 2.0 m in wheel diameter and with fully mechanized log carriage.

There are no sawmills, however, operating in our country in an efficient way with gang saws, profilers, log canters, and/or chipping edgers.

We have a reasonable quantity of circular saw blades, band saw blades, and other ordinary tools - all of which are available and produced in Brazil.

Plywood Industry

Plywood mills are generally equipped with the following:

- 1) Vats for steaming logs
- 2) Monorail for loading the log to the lathe
- 3) Rotary veneer lathe, 2.30 m wide
- 4) Veneer reels
- 5) Manually operated clippers
- 6) Continuous veneer dryer
- 7) Veneer splicer
- 8) Glue spreader
- 9) Pre-press (cold)
- 10) Hot press 12 to 18 opening
- 11) Manually operated sizing saw
- 12) Wide belt sander
- 13) Steam generator fueled with wood waste

All of the equipment including conveyors, bridge cranes, glue mixers, veneer slicers, chippers, burners and machines for blockboard manufacture are made in Brazil. A typical plywood plant produces about 30 to 40 cubic metres per day in one shift and is operated by 80 workers. The cost of the equipment is approximately US\$ 800.000.

Particleboard *

Most of the equipment for particleboard plants installed in Brazil is imported (mainly from Germany - Bison, Siwmpelkamp).

Fibreboard *

Most of the equipment for fibreboard plants is also imported however we buy these machines from Scandinavia as a rule.

* The author wishes to note that he is unfamiliar with the Particleboard and Fibreboard industries of Brazil.

