Brazil as a Future Source of Lumber for the United States

by

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Reduction in the area of the world's forests will undoubtedly continue in the future as it has in the past as increasing population requires more and more land for agriculture, and as the forests in many regions continue to be destroyed by fires and cutting, without provision for their renewal. Even in many of the older countries where the forests are appreciated and well cared for considerable areas are cleared each year for agricultural use. Further increases in the area of farm land in most countries must come to a large extent from land now occupied by forests. Here and there, as in France, Belgium, Holland, and Germany before 1914, the forest area has been slowly increasing through planting, while in other places, as in the United States, there is taking place a gradual natural reversion to forest of worn-out farm lands, yet these increases are very small in the aggregate, in comparison with the reductions in other places.

At the first glance, there appears to be no reason for concern regarding this steady but gradual diminution of the area of forests that is taking place in almost all parts of the world. There are still 4.4 acres of forest for each person in the entire world, capable of producing many times the present requirements for wood, which amount to only 32.5 cubic feet per capita per annum, or 7.5 cubic feet per acre of forest. To be sure, some countries which have had plenty of timber for their own may use it all up and have to seek elsewhere for their supplies, and others
which hitherto have used but little timber may enter upon an era of development and require large amounts, yet there still remain great reserve supplies of practically untouched forest in Siberia, in equatorial Africa, in south-eastern Asia and nearby islands in the Caribbean area and in the basin of the Amazon in South America.

Siberia, with over a billion acres of forest, if fully developed could export 6 billion cubic feet of timber a year, an amount equal to almost one-fourth of the total world consumption of sawtimber, while the tropical forests are capable of vastly greater production. The amount of standing timber in the Amazon basin and adjacent parts of South America, for instance, has been estimated at approximately 3,400 billion board feet of sawtimber besides a large quantity of smaller material. The tropical rain-forest of Africa, covering more than 350 million acres, with that of Asia and the East Indies, nearly 500 million acres, and that of South America, more than 1,000 million acres, could if fully developed and only moderately well handled produce continuously the enormous amount of from 200 to 250 billion cubic feet of wood a year, which is equal to four times the present world consumption.

There are several reasons, however, for not feeling entirely satisfied with the situation. In the first place, it will be a great many years before the tropical forests are able to supply a large part of the world's requirements for wood. Before they can do this, they must be opened up by adequate systems of cheap transportation,
and adequate supplies of efficient labor must be at hand both to construct the transportation facilities and to exploit the timber. This means a fairly large population of races accustomed to or easily adaptable to carrying on woods work on a large scale. Such a population is not now present in most of the tropical forest belt.

Another difficulty which must be overcome is the nature of the tropical forests themselves. They are mostly composed of a very great variety of species, intermingled in the greatest confusion and can be exploited economically only if practically all the important species can be utilized. Only a few of them are known on the world markets today, and those are chiefly cabinet woods, of which the supply and the possibilities for utilization are more or less limited. In order to dispose in the general market of large quantities of the less known timbers, particularly those which are more suited for common lumber and construction, a long process of education and economic pressure will be necessary to overcome the established habits and idiosyncrasies of the consuming nations.

If history, in the future, continues to repeat itself as it has in the past, when development of the tropical forest industry does take place, it will be accompanied by other phases of development which will have an important bearing on the general problem. In the first place, the tendency in all undeveloped countries is to try to hasten development by all sorts of inducements to private exploiters, such as concessions of public lands and forests, and a large
measure of freedom from restrictions as to their use of the resources. A very large proportion of the tropical forests may be expected to pass into private ownership, and to be exploited just as wastefully as have the forests of all other regions under similar circumstances. Not only will large quantities of the standing timber be destroyed without being utilized, and large areas of land now bearing valuable timber be turned into worthless brush-lands, but vast areas will perfectly legitimately be cleared for farming and other use.

To support only the population required to develop the forests will require a large area of agricultural land, and as much of the tropical forest is on land eminently suited to agriculture, it is to be expected that general agricultural development will accompany the exploitation of the forests. At the same time, in many of the tropical forest regions or near them are other valuable natural resources, such as minerals and water power, whose exploitation will mean a still further increase of population and industries. All of these will mean an enormous increase in the domestic consumption of wood.

Meanwhile the forests will continue to be reduced in area, and the quality of those remaining will tend to deteriorate, until the timber resources become so badly depleted that steps are taken to prevent further destruction and to build them up on a permanent basis. The history of forestry in most countries shows that effective steps toward forest regulation are seldom taken until a country's forest resources have become so depleted as to make it anxious
regarding its own future supplies of timber.

Another point that must be taken into consideration is the steady increase in the world's requirements for timber. The use of wood for fuel is tending to decrease, but this decrease is more than offset by the increased rate of consumption for other products. As fast as some uses of wood are dropped in favor of substitutes, others arise. Examples of comparatively new and rapidly growing uses for wood are its use for pulp, chemical utilization in plastics, rayon, insulating material, pressed material, etc. The consumption of wood has reached a fairly stabilized level in the past two decades, but there is no definite reason to believe that it will not increase in years to come.

Of the present consumption of wood other than fuel, three-quarters is from coniferous forests and about one-fifth from the temperate hardwood forests. The temperate hardwoods are on better soils than the conifers, and are mostly in the more densely populated regions where the pressure for agricultural land and land for industrial uses is strongest and most persistent. Furthermore, after the original hardwood forests are cut over, there is a tendency to cut over the second-growth stands for fuelwood and for various minor products before they reach sawtimber size, with the result that further sawtimber production from temperate second-growth hardwood stands will not be very important.

The crux of the world's timber supply problem during the next two or three generations, at least, is the coniferous
forests. Whether they will be able to meet the demands made upon them depends upon what steps are taken during the next few years to put them on a permanently productive basis. There are slightly more than 2,500 million acres of coniferous forest including several hundred millions of very low productive value. It is evident that the forest capital is being steadily depleted. Moreover, large areas of coniferous forest are being rendered incapable of further growth, temporarily at least, after being cut over. This is taking place in other countries as well as in the United States. With these facts in view, it is not untimely to look about for a source of timber for the United States if and when our supply does become exhausted.

The timber of Siberia, while plentiful, is somewhat out of the question both because of its remoteness and because of the difficulty of establishing suitable relationships with Russia. The timber of Africa, still plentiful, has neither the quality, abundance, nor the transportation advantages of the timber of South America. To deal with South America as a whole would involve a complexity of problems because of the thirteen independent governments which would have to be dealt with. For this reason the problem most logically narrows down to the country of Brazil which contains the bulk of the timber in South America.

Transportation

Before the development of means of cheap transportation, bulky commodities like timber could not be marketed at great distances from the points of production, and it was necessary for a country to depend on its own forests
for wood or do without. Now, however, the world is covered by an intricate and constantly expanding network of transportation systems—highways, railroads, canals, and steamship lines—and lumber is shipped from one side of the world to the other. Countries which have little timber of their own can easily get it from others which have a surplus. China obtains large amounts of lumber from North America, and South Africa gets much of hers from northern Europe.

A glance at the map shows that the mouth of the Amazon is closer to the Mediterranean countries than are the Atlantic ports of the United States, and except for Egypt and Syria, it is nearer these countries than are the forest of the East Indies. It is not so far from the Mediterranean and other European countries as are the great tropical forests of central Africa. Moreover, the Amazon region is less distant from English Channel ports than are the Gulf ports of the United States, and is almost as near as American Atlantic ports. The distance from the east coast of the United States to the mouth of the Amazon is about the same as the distance overland from the Atlantic to the forests of the Pacific Northwest, and is much shorter than the water route via the Panama Canal. South Africa, which will probably import considerable quantities of wood for many years, is as near to the Amazon as it is to the forest of the East Indies. The Amazon is navigable for ocean steamers throughout its whole length in Brazil, a distance of some 2,000 miles, so that the timber of the interior is practically as accessible
as that nearer the coast. These facts, together with the
growing inadequacy of the northern coniferous forests to
supply the world with construction timber, indicate that
the great equatorial forests of Brazil will be the most logical
contributors of large quantities of wood to the world mar-
kets. This creates both a good and bad effect on the problem
of United States' timber concessions in Brazil—the industry
will be easier to develop because of larger marketing areas,
but at the same time the competition in demand from other
countries will make it more difficult for the United States
to get profitable concessions.

The network of railroads along the coast of Brazil
is much more extensive than is realized by most people. This
feature, however, rather than being an aid to logging in the
future has produced just the opposite effect. Wherever the
railroads have been existent for any length of time, as
along the coastal regions, they have consumed for fuel most
of the available timber. Wood is practically the only thing
used by Brazilian locomotives for fuel, and they have consumed
enormous amounts for this purpose. This fact should not be
too discouraging, however, because at the present time, and
probably for some time in the future, logging by rail is
impractical where the tracks must be laid for the express
purpose of logging. In addition to the tremendous expense
of building the road it must be constantly maintained because
of the profuse jungle growth which springs up almost over-
night. In the future it is going to be much more practical
to log along the Amazon River where only a short haul will
bring the timber alongside ocean-going steamers. F. N. Hage-
bock, an American now engaged in logging in the Amazon country gives the following account of the industry in this region.

"Lumbering methods in Brazil cannot be compared with those of the Pacific Coast of the United States—the industry is still in its infancy.

"The chief menace to loggers, who have to spend at least six months in the interior to extricate the logs, is from wild animals. These men must be prepared for all emergencies. Many of the regions are extremely unhealthful for anyone but the natives.

"The only means of transportation is the Amazon River and its innumerable tributaries. All lumbermen count on the wet season to flood the rivers sufficiently to bring the logs down to the Amazon. As a rule, the loggers gather from the different rivers with their season's cut of logs, and from there come down the Amazon together to the different mills.

"Even in present-day practice, logs are towed as much as 1,000 and even 2,000 miles, which should mean that if a haul of this distance is profitable under present crude logging methods (trees are still cut by axe and clumsy handling methods necessitate short-length logs of 12 to 18 feet) by sending ocean-going freighters up the Amazon, the transportation cost of logs to the United States should not be prohibitive, especially with modern logging methods. Sawmills in Brazil now are not of the latest type and have no dry kilns, depending entirely upon air seasoning—a long process with some of the more dense species.

1 "The Timberman," August 1935, p.37
"The Brazilian government grants concessions of land to anyone who wants to develop the industry. What is most needed is machinery such as steam yarders and roaders, with plenty of cable and haulback, chokers, bull and snatch blocks to make a success of the business. Logging machinery utilizing gasoline as fuel would not be practicable as gasoline is too expensive, and the cost of transportation into the interior would make it prohibitive. Steam donkeys would be the only method which could be used profitably at the present time.

"The cost of launching such a proposition in Brazil with the importation of the necessary machinery would entail an investment of about $250,000."

Extent of Forests in Brazil:

The present area of Brazil covered with merchantable timber is estimated at about 40 per cent of the land area, or approximately 850 million acres. This is 28 acres per inhabitant. Large areas have been cleared for agriculture and a great deal of forest has been cut over for the timber, especially in the more densely populated regions and along the railroads, where the consumption of wood is enormous. Most of the domestic requirements for wood have been supplied by the eastern forests, while considerable quantities of the more valuable kinds have been exported since the colonial period.

As a result, the forests of the eastern and northeastern states have been greatly reduced. In Bahia, Espirito Santo, and Rio de Janeiro from one-third to one-half of the
original forest has been destroyed. In Sao Paulo at least half of the original area has been devoted to raising coffee and other crops, and the forests of Rio Grande do Sul have been reduced by half. The great interior forests of Amazonas, Acre, Matto Grosso, and Para, on the other hand, have scarcely been touched, except to cull out a few select trees close to the larger rivers or to harvest the wild rubber, and except for the small openings made by the Indian population, which are negligible. Considering the relatively small population, and the low requirement for wood as compared with that of peoples in colder climates, it seems hardly likely that nearly 400 million acres of forest can have been entirely cleared off. The figure of 850 million acres given above, therefore, must be very conservative, and it is probable that the total forest area, including timber not now merchantable because of small size or culled-over condition, is at least one billion acres, or about 33 acres per capita.

Character of the Forests:

With an area greater than continental United States, exclusive of Alaska, Brazil lies for the most part in the tropics and has a much less varied climate than the United States. The character of forest is far from uniform, however, because of differences in topography and rainfall.

The great Amazon plain, from the Atlantic to the slopes of the Andes, west of the Brazilian boundary, is a region of comparatively heavy rainfall. Near the coast there are distinct wet and dry seasons, while farther inland the precipitation is more or less evenly distributed throughout the year. Within this region the type of forest is
determined chiefly by its elevation above water. The forest is in an almost unbroken body north of the Amazon, except for some large open plains or "campos" in the northeastern highlands, and extends from 350 to 500 miles south of the river and even farther in narrow belts along the rivers. There are some 2,500 arborescent species here, out of possibly 10,000 woody plants, including shrubs and vines.

The Amazon Forest:

From the mouth of the Amazon to the foot of the Andes and from the upper branches of the Madeira to the forks of the Orinoco, the country is all forested, except for occasional breaks. This is probably the most extensive solid body of forest in the world. The forests of the Amazon may be classified in three types: the coastal forests; the river forests, subject to periodic inundation; and the forest of "terra firme", above the flood level.

The coastal forests, or "mangales", are composed of comparatively few species, and resemble the forests along the coasts of other parts of tropical America, as well as Africa and the East Indies. The important species are various mangroves, including mangue vermelho (Rhizophora mangle), ciriuba (Avicennia nitida), mangue branco (Laguncularia racemosa), Conocarpus erectus, and Bucida buceras. Of these, the first two are of importance for industrial use.

The inundated forests, occurring along the Amazon, are more varied in composition than the coastal type, and change considerable with differences in drainage and soil, as well as with geographical location. Along the lower Amazon, important species include the following:
Bombax monguba
Triplaris surinamensis
Cordia tetrandra
Spondias lutea
Virola surinamensis
Carapa guianensis
Sapium lanceolatum
Genipa americana
Platymiscium paraense
Couropita surinamensis
Olmedia calophylla
Guazuma ulmifolia
Calycopehllum spruceanum

Farther up the river are large areas of palm forest characterized by the jauary palm (Astrocaryum jauary), and on a little higher land by Euterpe precatorius and other palms. The trees on these higher lands are 130 feet tall, or more, while on the lower lands they seldom exceed 100 feet. Farther down the river, heights seldom reach 60 feet. These swamp forests are generally irregular in age and rather open. The dominant stand is usually composed of comparatively few species, so that four of five would furnish possibly three-fourths of the total cut, which will amount to some 3,000 board feet per acre. Dominant trees reach diameters of 2 or 3 feet, and some species reach this size in from 10 to 15 years, so rapid is their growth. Trees larger than this are not common, though occasional individuals are considerably larger. Ceiba, Bombax, Hevea, and Ficus are the largest trees in these forests. Soft textured woods predominate, many of them of light color, and therefore these forests promise to be of considerable commercial importance in the future.

The forests of "terra firme" are very rich in species, many of which are already established in the domestic
markets. Some of the better known trees are:

Vouacapoua americana
Zollernia paraensis
Euxylophora paraensis
Mimusops spp.
Chytroma jarana
Eschweilera mata-mata
Bertholletia excelsa
Castilloa ulei
Silvia itauba
Aniba canalilla
Hymenaea spp.
Parkia spp.
Proteum spp.
Caryocar spp.
Sterculia sp.

The forests of Amazonas are even richer in species than those of Para. The general height of these stands averages about 100 feet, with individual trees frequently as much as 160 feet tall. The largest trees are Parkia, Proteum, Caryocar, Bertholletia, Sterculia and Hymenaea.

The Forest of the Atlantic Coastal Region:

Behind the coastal belt are the foothills and slopes of the coastal ranges, which were originally almost entirely clothed with dense forests. It is in this region that most of the clearing has been done, for the greater part of Brazil's population is located in the eastern coastal belt and the plateau behind it, and outside of this belt there are few railroads. Vast quantities of wood have been cut for the railroads and industrial and domestic use, and for railroad ties and local construction; but much greater quantities have been piled and burned, just as was done in the Ohio valley, in order to clear the land for agricultural use. In the region of Rio Dulce and north there is a stand of at least 200 billion feet of hardwood. The main body of
the Atlantic slope forest is in northern Espírito Santo, southern Bahia, and the adjacent portion of Minas Gerais.

The forest is denser and the trees larger than in the Amazon region, and the variety even greater. There are 50 or more species of woods which are already of considerable commercial importance, including both cabinet woods and woods used for general construction, and many others will eventually come into more or less general use. Woods are mainly soft or of medium hardness, and can replace pine for construction, oak for furniture and finish, hickory and ash for implements. Average stands will cut from 10,000 to 20,000 board feet per acre, including all species, while the better stands yield from 1,400 cubic feet of squared trunkwood per acre at the higher elevations to 7,500 cubic feet on the bottom lands. Diameters run from 2 to 3 feet, clear lengths about 50 feet, and total heights over 100 feet. In typical stands in Bahia, averaging about 10,000 board feet per acre, ten species will furnish most of the cut, of which 42 per cent (by volume) will be soft-woods, similar to yellow poplar; 30 per cent of medium hardness, similar to maple, oak and ash; and 28 per cent harder than white oak. In the same region, in stands having from 8,000 to 10,000 board feet of hardwoods, it is said that about 1 per cent has properties and uses similar to rosewood; 5 per cent is similar to jacaranda cabiuna; 10 per cent resembles mahogany; 15 per cent oak; 20 per cent Spanish cedar. About 30 per cent of the volume of the stands in one locality is composed of five kinds of woods—jequitiba,
sapucaya, goncalo alves, vinhatico, and peroba; and from 80 to 90 per cent of the lumber cut now is peroba.

The Parana Pine Forest:

This is an exceedingly important forest region characterized by the predominance of Parana pine, (Araucaria brasiliana). This is the only coniferous tree found in Brazil, except for two comparatively unimportant species of Podocarpus.

Covering a gross area of 300,000 square miles, the area of commercially valuable pine forest (mostly between 22° and 27° latitude) is estimated at about 100 million acres. In many places the stands are fairly open, without underbrush, and are composed almost entirely of pine. They are usually four-stories, with Araucaria only in the upper story, 80 to 120 feet tall; a second story, 60 to 80 feet tall, of hardwoods, about 50 per cent being various species of the laurel family (Canellas and Embuia), and the rest Cedrela and various leguminous species; a third story with a large number of species, predominantly Lauraceae and Myrtaceae, 30 to 60 feet tall; and an understory of tree ferns, bamboos, and mate. The pines are straight and fairly free from branches in the lower part of the trunk, often having 50 feet clear length. Diameters of mature trees occasionally reach from 5 to 8 feet, and heights of 165 feet are common. Average mature trees are about 3 feet in diameter, with 4 to 5 sixteen-foot logs. The hardwood species, which include many of those found in the coastal region, comprise an average of about 10 per cent of the stand and are more apt to be crooked than the pine. Embuia,
various canellas (Nectandra spp.), and cedar (Cedrela) are of the greatest commercial value among the hardwoods. There are several species of comparatively soft wood, including mandiogueorba, umbanda, and cachete, which may be used for paper pulp, although they produce a rather inferior grade, which must be mixed with better material to make good paper. In Parana, stands cutting from 17,000 to 20,000 board feet per acre have been reported, but the general average for the commercial stands, leaving out blanks, is from 7,000 to 12,000 board feet per acre, and stands running 25,000 board feet are not rare. Logs run about 3 per 1,000 board feet.

The total stand of Parana pine has been estimated at all the way from 200 to 650 billion board feet, and judging from the available data it will fall somewhere between the two estimates. At any rate the supply is enormous in comparison with the demands that are made on it now or that are likely for many years. It has been estimated that 50 billion feet is now within reach of existing transportation facilities.

**Character of Ownership:**

Data regarding ownership of the Brazilian forests are very limited. The federal government turned its rights over to the individual States, and now owns only the forests of the territory of Acre, which was acquired from Bolivia in 1903. The states own large areas—probably the bulk of the Amazon and coastal forests, but not so much of the Atlantic slope and pine forests, the more accessible portions of which are largely in private ownership. Individual holdings
are mostly large.

**Annual Cut:**

Statistical data regarding the amount of timber cut annually are extremely fragmentary. Little lumber is cut except in the eastern coastal region, where most of the population, industries, and railroads are concentrated. During the war, development of the Paraña pine forests was undertaken on a fairly large scale, in comparison with previous operations, and now more lumber is cut in that region than in any other. The production in the Amazon region is still small, though it is increasing. The annual lumber cut that reaches the general market is approximately 55 million board feet of hardwoods and 150 million feet of Paraña pine. Besides lumber, from 8 to 12 million ties are used annually, equivalent to from 200 to 300 million board feet, and nearly all of these are native woods.

Brazil uses more wood for fuel than for any other purpose. The total fuelwood consumption of Brazil is probably more than 1,200,000,000 cubic feet a year. The total cut of all material, including poles, posts, piling, house-framing, mine timbers, firewood, and sawed and hewn material is at least 1,300,000,000 cubic feet, and perhaps more.

**The Outlook for the Future:**

Almost the only Brazilian woods that have been important in the export trade have been cabinet woods, dyewoods, and others for special purposes, mostly very hard or deeply colored and of kinds that occur only scatteringly in the forests. On this account the idea has prevailed that these great forests can never be important sources of construction
timber or of other soft woods for the uses for which the softwoods of the northern hemisphere are suited, and that whatever hardwood timber they produce must inevitably be extremely high in price, because of the excessive costs of logging and transportation.

According to the testimony of numerous competent persons\(^2\), however, such ideas are founded on a misconception of the facts. One states, for instance, that in the mountains of Bahia the bulk of the stand is composed of about 10 species, and that 42 per cent of the volume is of soft-textured woods, corresponding to yellow poplar; 30 per cent of medium hardness, corresponding to maple, ash, and oak; and only 28 per cent harder than white oak. Similar conditions are reported to prevail in the "terra firme" forests of the Amazon region, while in the lowland forests the proportion of softwoods is still greater.

U.S. Investments:\(^3\)

The United States investments in Brazil, including commercial enterprises and loans to governments, between the years 1913 and 1929 grew from $20,000,000 to $476,000,000. About one third of these investments were in the nature of loans to the Brazilian government. The money was to be spent for public improvements, but actually much of it went for graft, for buying immunity from crime, and for preparations for war. The loans were conceded only after very severe mortgage conditions had been agreed to by Washington Luis, then Brazilian dictator, and caused deep resentment among the helpless nationals who saw the future of their country.


\(^3\)Inman, "Latin America", p. 423.
thus pawned by their dictators.

As long as the dictator could float on the tide of general prosperity, see foreign commerce grow, sell for high prices his country's raw materials; as long as he could continue to borrow from the foreign banker funds to beautify his capital and develop a certain amount of public works in the provinces, while handing out lucrative jobs to friends and paying well the army which supported him, he was fairly secure. Especially was this true if he took pains to stand well with the foreign government from whose citizens the money came and to whom much of his business was thrown, so that this government would deal severely with his enemies when they tried to start a revolution.

But when the source of borrowing suddenly ran dry and the price of raw materials fell sharply, the "dance of the millions" suddenly ceased. The stock market crash in Wall Street in October, 1929, effectually stopped loans, and also accelerated the movement, which had already begun before the crash, to puncture the balloon of false prosperity by deflating the price of coffee in Brazil. Currency rapidly depreciated, unemployment grew by leaps and bounds and poverty of the most pitiful kind brought starvation to the people. The university students, the labor organizations and other social-minded groups saw their chance and joined hands with the army, now stripped of former rewards. Out went the regime of Washington Luis, and with him and other Latin-American dictators came a fall in the value of Brazilian bonds.
Relationship Strained:

This reaction brought about one of the most serious breaks in the friendship between the Americas that has ever occurred. In Latin America the air was rapidly filled with accusations against the bankers who had pressed the loans on the dictators. In North America the old cry was raised about the lack of honor in Latin America. The Southern countries began to suffer not only from the general world depression, but from unbearable service charges on foreign loans.

Of conditions in Brazil in 1936, Professor Erasmo Braga of Rio de Janeiro gave the following description:

"The present revolution is only a symptom of the internal trouble which for many years has caused increasing unrest and discontent. Professional politicians, illiteracy, clericalism, superstition among the masses, graft, bribery, for which foreign corporations have a large share of responsibility, squandering of public funds, indifference to national and political problems on the part of the very large section of the educated classes, maladjustment of democratic administrative machinery to the mentality of corrupt politicians--all these elements have aggravated the social and political situation. Since 1922 there has been growing unrest. The national debt has increased enormously. The rapid development of the country on account of its vast natural resources, geographic position and activity of the industrial, commercial and agricultural enterprises, has more and more become handicapped by out-of-date and fragmentary legislation. Utilitarianism has deprived the nation of social and political ideals, and the prophetic voice of the few sincere leaders has found but a faint response from a small group. Communism has no grip on the Brazilian mind. Conditions of life are such that the middle classes suffer much more than the laborers. To justify the revolutionary movement, its leaders have bound themselves to reconstruct social order according to the new economic situation in the world, and do away with the evils which have caused increasing unrest and discontent. Their task is tremendous."

The crisis in economics brought a corresponding crisis in morals. A distinguished British engineer, who has spent most his life in South America, says:
"The greatest hindrance to the real advance of South America in public morality lies in the facility with which a very flood of money is thrown at the governments of these republics from London and New York."

Brazil's New Constitution and Social Changes:

The present constitution, adopted in 1934, bears little trace of the more radical elements usually found in Latin-American constitutions. The strong note of nationalism (formerly less prominent in Brazil than in any other large American country) indicates that a marked change is coming over the land. Not only nationalism but a minor tinge of socialism appears in the document as well as greater centralization. Immigration has been drastically limited; immigration from any one country may not exceed annually 2 per cent of the total number entering Brazil during the past fifty years. Provisions are included in the new constitution requiring that foreign enterprises and industries be directed and managed by Brazilians. These last two stipulations are in consonance with the general Latin-American trend to compel foreign capital to contribute to national development, but at the same time deal a blow to any lumbermen who might enter lumbering in Brazil where labor is so scarce and investment of capital so risky.

Under the new provisions, directorates of public utilities must have a majority of Brazilian nationals and the state may take over any industrial enterprise "in public interest". Deposit banks may be required to submit to progressive nationalization.

The Constitution provides for a maximum working week
of six days and a maximum day of eight hours. It decrees that no worker's wages shall be less because of age, sex or marital status.

Behind the present confusion in Brazil are certain facts. The new Constitution adopted in 1934 is a long, complicated document subject to many interpretations. While mostly conservative, it has certain modern tendencies toward a totalitarian state which make for confusion in a great sprawling unorganized country. The Department of Labor has become exceedingly important and tends to inject itself into the control of industry and all economic life. The limitations placed on immigration by the new Constitution are so strict that great dissatisfaction is now expressed. Under the quota basis only 29,585 immigrants entered Brazil in 1935, according to the official record. New legislation will no doubt be passed giving an opportunity for states to bring in laborers who are so greatly needed in agriculture and industry. There is a marked tendency toward national control of industry, and limitations on both foreign labor and capital are developing.

The disfavor for Americans and American capital which grew in the minds of Brazilians occasioned by pressure and somewhat ruthless tactics of American capitalists during the depression has been agitated to a great extent by the serious plight of the Brazilian coffee industry. However, the reaction to this incident should be favorable to the development of the lumber industry.
Coffee and Exports:

Brazil depends upon coffee more than any other single item of export for her support, this single product consisting of three-quarters of her export trade. As the world's greatest producer of coffee, Brazil has been affected seriously by the world's overproduction of raw materials. The Sao Paulo Coffee Institute has attempted to control coffee exports in an effort to sustain the price of this commodity, but the effort has failed.

Moreover, the Brazilian budget shows a chronic deficit—a deficit which has usually been covered by foreign loans. A considerable part of the loans made to her has been used in speeding up the production of coffee and financing its storage while awaiting better prices. The average consumption of Brazilian coffee is 16 million bags a year. In 1931 there were 38 million bags in storage because of overproduction which had been financed by foreign loans. In spite of the burning of millions of bags (12 million in 1932) the price of coffee dropped from an average of 25 cents a pound in most of the post-war period to an average of 5 cents a pound in 1932.

With her coffee market exploded and apparently with no sight of its return, and even though it should return the memory of the 1932 experience will be a lasting one, Brazil should be only too eager to find a source for replacing the deficit left in her budget by the fall of coffee. The most logical solution, indeed, is development and utilization of her vast lumber resources. In lumber Brazil will be able to find a stable source of industrial income thus supple-
menting the income from her coffee industry and relieving her
dependence upon a single product for economic support.

Labor in Brazil:

Because labor has been so cheap in the Brazils, it has been generally supposed that it is abundant, but as a
matter of fact it is scarce in almost every section of South America. Although it holds the whip hand, if it only realized the fact, until recently industrial unrest was not known. Sooner or later, however, the class struggle accompanying the industrial age was bound to invade Brazil. The personal relationships of the old days between employer and employee have been loosened and severed. Workmen began to congregate in large numbers in cities where they saw new life and learned of the outside world and its economic problems. When they first heard of the strike as practiced by their brothers in Europe and North America, and essayed to employ it, they were promptly met by military force and crushed. A strike was a revolution. But today the strike is recognized as legitimate in Brazil.

While unions are becoming stronger all the time, labor in Brazil is still far from any idea of organizing for the purpose of forcing better conditions. Faint signs of an awareness of an outside world struggle are seen, however, in the little papers which reach even some of the more remote parts of the country.

It is important to keep in mind the fact that Brazilian labor organization has followed European rather than North American models. Before the World War, relations
between the United States and South American labor, as in most other fields, were insignificant. On the other hand, European immigrants and propagandists, sent for that special purpose, began to plant ideas of organization and resistance in the docile minds of the Brazilians.

The Brazilian Labor party has been working toward a centralization of the trade union movement. According to recent (1936) estimates, the total number of trade-union organizations in Brazil is 727, with a membership of 930,000.

Despite its rapid growth, the labor movement has a long way to go before it will be in a position to accelerate the development of well-rounded social legislation. In a country where political changes come so suddenly, organized labor, although small in numbers, has a great opportunity if only it knows its mind and is united.

In an effort to protect the national life from exploitation by foreign countries, the present law fixes the ratio of national workers to be employed by foreign companies at 75 per cent of those employed.

Will Communism Succeed in Brazil?

The arguments against communism in Brazil begin with the fact that the Brazilian's outstanding characteristic is individualism. The Brazilian individualist, on the other hand, is perfectly willing to let his government organize the big business ventures, and will even refrain from serious complaint even against a dictator so long as he confines his dictating to public affairs and allows the individual to live unmolested in his private life. So the argument that
Brazilians, as individualists, are opposed to socialized programs, cannot be given too much weight.

There are stronger arguments, however, against communism. First, there is the lack of a strong national capitalistic class to direct an industrialized order. Then, in Brazil there is no proletariat in the Russian sense. There is not the least feeling of unity between city and country workmen—the former often feeling themselves partners to the privileged classes who live off the exploited rural workers. The almost complete lack of any feeling of solidarity among the various exploited groups has been the despair of communist organizers. Even where labor is organized only a very small percentage of workmen are in the unions and the latter are hopelessly divided, the number of small groups running in the hundreds. This is why communism, as a movement, has up to the present done little more than gain theoretical converts among groups of intellectuals, stir discontent among the lower classes, and organize strikes or revolts which have usually been crushed by government forces. And in spite of such bold tactics as shutting off United States radio broadcasts to facilitate and make more efficient the spreading of communistic, nationalistic, and even more radical propaganda, as long as these countries depend so completely on capital from the United States, the latter, in spite of all the protest of the nationalists and communists, will exert a strong influence against any practical advances of communism.

Conclusion:

In a paper such as this, the reader must draw his
own conclusions—a picture has been presented. If the paper has convinced the reader of the practibility of the United States getting her lumber from Brazil in the future it has completed its purpose.

In the first part, a view of the lumber situation of the world was given in justification of choosing Brazil as the potential source for our lumber needs; the rest of the paper has pointed out some of the advantages and some of the difficulties of the problem.

The picture as a whole is probably far from complete—the entire thing is theoretical, and only the future will tell whether or not the ideas herein are founded upon a sound basis. However, from the reading and study I have put into the problem, I do believe that Brazil is the logical country to supply the United States with its lumber in the future.
Literature Cited