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BRAZIL: *An Expanding Economy*

WYTHE · WIGHT · MIDKIFF

BRAZIL

An Expanding Economy

BRAZIL
1000 MILES
ATLANTIC OCEAN
PACIFIC OCEAN
EQUATOR
TROPIC OF CAPRICORN
70°W
60°W
50°W
40°W
30°S
20°S
10°S
COLOMBIA
VENEZUELA
GUIANA (BR.)
GUIANA (NETH.)
GUIANA (FR.)
PERU
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
URUGUAY
GEORGETOWN
PARAMARIBO
CAYENNE
LA PAZ
SUCRE
ASUNCION
SANTIAGO
BUENOS AIRES
MONTEVIDEO
La Plata
RIO DE LA PLATA
AMAZONAS
PARÁ
AMAPÁ TERR.
MARAJÓ ISLAND
MARANHÃO
PIAUÍ
CEARÁ
RIO GRANDE DO NORTE
PARAÍBA
PERNAMBUCO
ALAGOAS
SERGIPE
BAHIA
GOIÁS
MATTO GROSSO
MINAS GERAIS
ESPIRITO SANTO
RIO DE JANEIRO
SÃO PAULO
PARANÁ
SANTA CATARINA
RIO GRANDE DO SUL
ACRE TERR.
GUAPORÉ TERR.
RIO BRANCO TERR.
FERNANDO DE NORONHA TERRITORY
FEDERAL DISTRICT
FUTURE FEDERAL DISTRICT
PIPE LINE PORTS
Manaus
Belém
Fortaleza
Recife
Maceió
Salvador
Aracaju
Natal
São Luís
Teresina
Parnaíba
Sobral
Iguatu
Juazeiro
Petrolina
Remanso
Bom Jesus
Barra
Barra do Corda
Caxias
Carolina
Pto. Nacional
Peixe
Marabá
Alcobaça
Santarém
Óbidos
Prainha
Macapá
Amapá
Cametá
Souzel
Vigia
Bragança
Tucuruí
Marabá
Conceição do Araguaia
Araguaína
Gurupi
Miracema do Norte
Porto Nacional
Palmas
Barreiras
Bom Jesus da Lapa
Juazeiro
Petrolina
Paulo Afonso
Propriá
Aracaju
Estância
Laranjeiras
Alagoinhas
Cachoeira
Jacobina
Bonfim
Irecê
Barra
Contendas
Vitória da Conquista
Caetité
Guanambi
Jequié
Ilhéus
Canavieiras
Belmonte
Caravelas
Mucuri
Nova Viçosa
Teófilo Otoni
Governador Valadares
Caratinga
Manhuaçu
Muriaé
Leopoldina
Cataguases
Ubá
Juiz de Fora
Barbacena
São João del Rei
Lavras
Varginha
Três Corações
Pouso Alegre
Itajubá
Santa Rita do Sapucaí
Poços de Caldas
Passos
Franca
Ribeirão Preto
Barretos
Araraquara
São Carlos
Rio Claro
Limeira
Piracicaba
Campinas
Jundiaí
São Paulo
Santos
Sorocaba
Itapetininga
Itapeva
Ourinhos
Assis
Presidente Prudente
Andradina
Araçatuba
Birigui
Penápolis
Lins
Bauru
Jaú
Botucatu
Avaré
Itapetininga
Registro
Iguape
Cananéia
Paranaguá
Curitiba
Ponta Grossa
Guarapuava
Irati
União da Vitória
Mafra
Joinville
Blumenau
Itajaí
Florianópolis
Tubarão
Criciúma
Lages
Caçador
Joaçaba
Chapecó
Concórdia
Videira
Canoinhas
Porto União
Rio Negro
Palmeira
Iguaçu
Foz do Iguaçu
Posadas
Encarnación
Asunción
Pilcomayo R.
Paraguay R.
Paraná R.
Iguaçu R.
Uruguay R.
Tietê R.
Grande R.
Rio das Mortes
Araguaia R.
Tocantins R.
Xingú R.
Juruena R.
Arinos R.
Paranaíba R.
Rio Doce
Rio Pardo
Rio Jequitinhonha
Rio São Francisco
Rio Grande
Rio Verde
Rio Paraíba
Rio Itabapoana
Rio Itapemirim
Rio Itapicuru
Rio Vaza-Barris
Rio Real
Rio Corrente
Rio Parnaíba
Rio Gurupi
Rio Tocantins
Rio Xingú
Rio Tapajós
Rio Madeira
Rio Purus
Rio Juruá
Rio Javari
Rio Içá
Rio Japurá
Rio Negro
Rio Branco
Rio Orinoco
Rio Meta
Rio Amazon
Rio Trombetas
Rio Nhamundá
Rio Jamundá
Rio Paru
Rio Jari
Rio Oiapoque
Rio Araguari
Rio Tumucumaque
Rio Maracá
Rio Uaupés
Rio Içana
Rio Guainía
Rio Casiquiare

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BRAZIL
An Expanding Economy

BY
GEORGE WYTHE
with the assistance of
ROYCE A. WIGHT
and
HAROLD M. MIDKIFF

New York
THE TWENTIETH CENTURY FUND
1949

ACKNOWLEDGMENT is hereby made to the following for permission to reproduce the photographs in this book: José Medeiros, Rio de Janeiro (the sawmill at Teresina and the boatman on the Amazon); Pan American World Airways System (the fishing boats at Recife); National Steel Company of Brazil (its plant at Volta Redonda); National Coffee Department of Brazil and Photo Rembrandt, Rio de Janeiro (the coffee pickers); Three Lions, Inc., New York City (the medical students at Pôrto Alegre); Moore-McCormack Lines, Inc. (the harbor of Rio de Janeiro and the Cacao Institute of Bahia, also the view of a street in Salvador which appears on the jacket). Acknowledgment is also made to William D. Johnston, Jr., Chief, Section of Foreign Geology, United States Geological Survey, who plotted the map of mineral areas.

MANUFACTURED IN THE UNITED STATES OF AMERICA
BY THE LORD BALTIMORE PRESS, BALTIMORE, MARYLAND

We have been contemporaries and fellow laborers in the cause of liberty and we have lived together as brothers should do in harmonious friendship.

Washington to Rochambeau
February 1, 1784

FOREWORD

BRAZIL AND THE UNITED STATES are long-time friends. These two countries have long been held close by strong ties of sentiment and economic interest. Two world wars have also bound them in an active military alliance.

The uneasy peace that has followed World War II finds the United States in a position of economic strength. We have capital funds and a reservoir of engineering and mechanical skills that can be put to use in foreign lands. Brazil, on the other hand, is relatively undeveloped economically, but has vast potential resources, both human and material. Here is the basis for further cooperation profitable to both countries—laid on a foundation of long-standing friendly intercourse.

But before cooperation can be effective, there must be greater knowledge on the part of the general and business public of the United States of what Brazil and the Brazilians are like, how the Brazilian economy is organized and operated, and what are the interrelations between the economy and the government. It is broad questions such as these which this book is designed to answer.

The Fund sent a seasoned team of economic investigators headed by George Wythe, on leave of absence from his position of Chief of the American Republics Division of the U. S. Department of Commerce, to Brazil for several months in 1947 and 1948 to gather the information "on location" on which to base this report. They traveled extensively, they met leading people in government, industry, agriculture and labor, and they dug deeply into documents available only in Brazil. In all their work they were guided by one clear directive from the Fund: to produce a report which would stimulate the use of American capital and skills in Brazil, not only for the advantage of the United States, but also—and most especially—to increase the standard of living and the well-being of the people of Brazil.

This volume is part of a developing concern of the Twentieth Century Fund in helping to work out a more enlightened American foreign economic policy. In 1947 the Fund published an over-all study of America's role in foreign trade and investment in the postwar world entitled *Rebuilding the World Economy*. As part of this project a distinguished special committee formulated a program of action directed toward the increase of world trade in the interest of the United States as well as other countries. Earlier in 1949 the Fund published the results of a survey similar to this one on Brazil, but dealing with another country of special interest to the United States—Turkey. Its title is *Turkey: An Economic Appraisal.*

In neither of these later studies of individual countries did a special committee formulate a program of action as in the case of *Rebuilding the World Economy*. They are primarily factual and descriptive. But in each case the facts themselves, when put together in these volumes, reveal opportunities—and pitfalls, as well—for United States economic and diplomatic policy. It is the hope of the Fund that these and future studies, taken together, will help develop a pattern for effective action by the United States in meeting the challenge of the postwar world.

To Mr. Wythe and his associates goes the deep appreciation of the Fund for a timely job well done and to Mr. George Soule for his able editorial assistance in helping to prepare the report for publication.

EVANS CLARK, *Executive Director*
The Twentieth Century Fund

330 WEST 42D STREET
NEW YORK 18, N. Y.
JUNE 15, 1949

AUTHOR'S PREFACE

THERE IS NO COUNTRY in the world—including those in which technical development has made the most progress, such as the United States itself—in which capital, management, labor and resources may not be joined together for more production, to the mutual advantage of all concerned. That Brazil could use new investment, that a return could be paid to those who supply it, and that the Brazilian people could benefit from a wise and skillful employment of whatever funds may be available, is axiomatic. If American funds, energies and skills are to be used in Brazil, the special nature of the opportunity and the degree to which it is facilitated or hampered by the attitudes of Brazilians themselves, and the conditions under which American assistance would have to operate, should be widely known in the United States.

Leading Brazilians feel an urgent necessity for further development of their country. They are aware that this will require large amounts of new money capital, and that much of the essential equipment will have to be imported. Yet there are reservations in their willingness to accept capital or skills from abroad, and many restrictions are imposed on the ways in which resources may be used.

Also, the chronic inflation that has afflicted Brazil and the consequent currency depreciation have discouraged savings and investment and have been a source of high interest rates. These conditions have hampered the productive use of capital—both Brazilian and foreign. As the Brazilians themselves must provide by far the major portion of funds for the nation's development, it is to the domestic, even more than foreign, interest of Brazil for the government to create conditions more favorable to investment.

Until 1930 both immigrants and foreign investment were welcomed in Brazil. Total foreign investments were then estimated at $2,628 million, of which the British held slightly

over half and the United States one fifth. The depression at that time emphasized Brazil's dependence on foreign trade and investment by cutting deeply into her income from exports and at the same time sharply diminishing the inflow of capital. The resulting crisis gave rise to a drastic change of policy in the direction of economic nationalism. Immigration was restricted to relieve unemployment, and controls were extended into commercial, industrial and financial activity. The nationalistic attitude was embodied in the new constitution of 1934, and was retained when a new fundamental law was promulgated by Vargas in 1937. Another and more liberal constitution, adopted in 1946, however, is somewhat more flexible, leaving restrictive measures to the discretion of the Congress.

Many restrictions on the entry and the activities of foreigners still exist. They cover persons and employment, property and concessionary rights, types of business activity, monetary transfers and special taxes.

Brazil is working on ambitious plans for improvement and development—but with a divided mind. Brazilians want to increase their production and their income, they would like the foreign goods and money which would enable them to do so, yet their experience has led them to distrust too great a dependence on foreign capital and on foreign markets which may quickly decline. But, of course, this attitude is subject to change with time, provided suitable arrangements can be worked out. (It is of interest to note that the Joint Brazil–United States Technical Commission, in its report submitted as this study was going to press, found "evidence now of a growing appreciation of the need" for foreign investments, and recommended clarification of the treatment that may be expected by investors. See Appendix 3, pp. 386-87.)

The author is indebted to so many persons for suggestions and information in connection with the preparation of this volume that it would be impractical to mention all of them. But he would like to mention a few, beginning with Evans Clark, Director, and J. Frederic Dewhurst, Economist, of the Twentieth Century Fund for their support and encouragement in undertaking and prosecuting this study.

During his sojourn in Brazil, the author was also specially indebted to the following:

At Rio de Janeiro—

Hon. Daniel de Carvalho, Minister of Agriculture
Hon. Clovis Pestana, Minister of Transport and Public Works
Hon. Israel Pinheiro, member of the Federal Chamber of Deputies
Dr. Mário de Bittencourt Sampaio, Director General of the Department of Administrative Services
Dr. Valentim F. Bouças, Secretary of the Technical Council of Economy and Finances, Ministry of Finance
Dr. Ayrton Aché Pilar, Assistant Secretary of the Technical Council of Economy and Finances, Ministry of Finance
Dr. Gerson Augusto da Silva, of the Technical Council of Economy and Finances, Ministry of Finance
Dr. Octavio Gouveia de Bulhões, Chief, Division of Economic and Financial Studies of the Minister's Cabinet, Ministry of Finance
Dr. Raul Castro e Silva de Vincenzi, Ministry of Foreign Affairs
Dr. Dermeval José Pimenta, President of the Companhia Vale do Rio Doce
Dr. Renato de Azevedo Feio, General Manager of the Santos-Jundiaí Railway (former Director of the Central Railway)
Dr. M. A. Teixeira de Freites, former Secretary, and Dr. Rafael Xavier, present Secretary, of the Instituto Brasileiro de Geografia e Estatística
Dr. Christovam Leite de Castro, Secretary of the Conselho Nacional de Geografia
Dr. Luiz Simões Lopes, Director, Fundação Getúlio Vargas
Dr. Eugenio Gudin, Professor of Economics at the Faculty of Economic Sciences
Dr. Fernando M. de Carvalho, lawyer and economist
Dr. Henrique Guedes de Mello, President of the Rio Stock Exchange
Dr. Alfredo de Oliveira Pereira, Chief of the Section of Study and Analysis of the Ministry of Labor
Dr. Richard Lewinsohn, of DASP
Engineer Americo L. Barbosa de Oliveira, of DASP
Ralph E. Motley, President, and Vincent Milligan, Executive Vice-President, American Chamber of Commerce for Brazil
Robert K. West, representative of the Export-Import Bank

Also, the following officials of the United States Embassy at Rio de Janeiro:

Clarence C. Brooks, Counselor of Embassy for Economic Affairs
Claude W. Courand, First Secretary
Erwin P. Keeler, First Secretary
Glenn G. Wolfe, Administrative Officer
Guy L. Bush, Agricultural Attaché
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George E. Miller, American Consul
Francisco Vera, Secretary of Commercial Federation
Mario P. G. Penna, President of Commercial Federation
Wilfred Shorto, Treasurer of Cooperative Sugar Centrals

At Salvador—

Kenneth Yearns, American Consul
Dr. Ignacio Tosta Filho, Special Adviser to the Governor of Bahia

At Santos—

Arthur G. Parsloe, American Consul

At São Paulo—

Cecil M. P. Cross, American Consul General
Charles K. Ludwig, American Consul
Ray H. Crane, American Vice-Consul
Jayme Cintra, General Manager, Paulista Railway
Dr. Ary F. Torres, industrialist and President of the Instituto de Pesquisas Tecnológicas
Ernesto Barbosa Tomanik, President, São Paulo Stock Exchange
Engineer Alvaro Pereira de Souza Lima, Director of Mogiana Railway and Vice-President of the committee to revise the national railway plan
L. C. Heilbronner, Basic Economy Corporation
J. Pokrovsky, economic research department of Mogiana Railway
R. K. Hughes, former President, American Chamber of Commerce of São Paulo
Engineer Paulo Garcez of the Paulista Railway

At Vitória—

Robert Bruce Harley, American Vice-Consul

In Washington, the following were particularly helpful:

Allan Dawson, Chief, Division of Brazilian Affairs, Department of State
Richard O'Toole, of Division of Brazilian Affairs, Department of State
Dr. Charles F. Carson, Joseph Magurn, Miss Gertrude Heare, and Mrs. Irene Johnson, of the American Republics Division, Office of International Trade, Department of Commerce
Dr. Hernane Tavares de Sá, of the Pan American Union
Lyn Smith Manduley, of the Pan American Union
Also Mrs. Virginia Henning, who helped put the manuscript in shape

A special word of thanks is due to Dr. Royce A. Wight, Harold Midkiff and Mrs. Midkiff, who accompanied the author to Brazil and assisted him in the studies on which this report is based.

GEORGE WYTHE

JUNE 1, 1949
WASHINGTON, D. C.

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BRAZIL

An Expanding Economy

Chapter 1

BRAZIL AND THE BRAZILIANS

AMONG THE republics of the Western Hemisphere Brazil occupies a unique position. It is the largest territorially, exceeding the area of the United States without Alaska. It is the only Portuguese-speaking republic. Alone among the American nations it retained the monarchical form of government during its formative years as an independent country.[1]

In the diplomatic annals of the United States, Brazil also occupies a distinctive place. The United States was the first country to recognize Brazilian independence. Although there have been some sharp differences between the two governments, notably during our Civil War, relations have been exceptionally cordial, and no ancient grievances mar our historic friendship. Brazil made common cause with the United States in both world wars. In the recent war Brazil not only sent an expeditionary force to North Africa and Italy, but also gave naval and air support and provided bases and facilities of inestimable value. Brazil has produced some of the world's ablest diplomats. The illustrious names of Rio Branco, Barbosa, Nabuco, Mello Franco, Aranha, Fernandes, stand out among those who have joined with United States representatives in working for a peaceful and democratic solution of international problems.

The United States has played a leading role in Brazilian commerce for approximately a century. Even before the Civil War the United States had become the best market for Brazilian produce, especially coffee.

1. An "empire" was set up at Mexico City in 1822 but it lasted less than a year.

Brazil found inspiration in the United States for the establishment of a republic, in the drafting of its first constitution and in establishing its legal system and economic policy. In the session hall of the Brazilian Supreme Court two striking figures are depicted in the windows of the upper part of the rear wall. On one side is the sacrosanct figure of the Emperor Justinian, and on the other, Chief Justice John Marshall, thus commemorating the two streams that merge to form Brazilian jurisprudence. The Brazilian Senate is housed in the Monroe Palace, named for the fifth President of the United States.

Today, more than ever, Brazilian eyes and hopes are turned toward the United States, not only in the economic field but also in such matters as literature, art and medicine, where Paris once reigned supreme. Brazil's dependence on the United States both as a market and as a source of capital goods was heightened by the war. American goods, styles and "know-how" are the mode. Brazil also looks to us for scientific leadership and cultural fellowship. In these hopes and expectations lies a challenge that we can ill afford to neglect.

The Land That Is Brazil

Brazil is not only the largest of the American republics, it is one of the three or four largest countries in the world. Occupying half of the South American continent, it extends 2,670 miles north and south and 2,690 miles on the east-west axis. Brazil is roughly the shape of a vast triangle, and is a smaller replica of the South American continent itself. The eastern angle of the triangle, or "the hump," points toward Africa, the western angle rests on the Andes and the southern angle points toward the South Pole.

Mountains, Plains and Rivers

High and rugged mountains comparable to the Andes or Rockies are unknown in Brazil. The highest peak is under ten thousand feet. Brazil is an old land geologically, and

such mountains as do exist are worn and smoothed. At the same time, some two thirds of Brazilian territory consists of highlands—plateaus ranging from a few hundred to around three thousand feet, surmounted here and there by low mountains.

The highlands reach their greatest elevation not far from the southeastern coast. The highest peak, Pico da Bandeira (9,462 feet), is northeast of Rio de Janeiro and west of the port of Vitória. From Salvador (Bahia) southward to Pôrto Alegre, capital of the state of Rio Grande do Sul, a great escarpment rises only a short distance inland from the Atlantic Coast. This wall-like barrier is surmounted in places by ranges which reach elevations of seven or eight thousand feet. Only a few rivers cut through these mountains to the sea. The principal rivers of southeastern Brazil flow westward to the Paraná and the Uruguay rivers, tributaries of the Rio de la Plata. The Paraguay River, another tributary of the La Plata system, drains southern Mato Grosso.

The second highest elevation is in the Guiana highlands, north of the Amazon, on the borders of Venezuela and British Guiana. Other important mountain ranges or ridges of tabular upland are found in the states of Minas Gerais, Goiás and Mato Grosso, and in the northeast.

The principal plains are found in the upper Amazon Valley, in the floodplain of the Paraná River and along the coast.

Northern, western, and west central Brazil are drained and dominated by the mighty Amazon, one of the most extensive river systems in the world. Topographically, its course may be divided into three sections. The lower Amazon, or the estuary, is low-lying, but between the Xingú and the Madeira rivers the northern and southern highlands come close to the river, forming at times sharp bluffs above the floodplain. Above Manaus, capital of the state of Amazonas, the valley broadens steadily, forming a great fan-

shaped plain about eight hundred miles wide just east of the Andes. The main stream of the Amazon is navigable throughout its course in Brazilian territory and well into Peru. The extraordinarily low gradient of the river is shown by the fact that the drop from Sapurara (formerly called Tabatinga), on the Peruvian-Colombian border, to the sea—a distance of more than two thousand miles in a straight line—is only 213 feet. Its tributaries, however, are broken by falls and rapids, although there are long navigable stretches.

The São Francisco River rises in the mountains of central Minas Gerais, flows northward parallel to the coast for a thousand miles or so, and then turns sharply eastward to empty into the Atlantic. Although its course is broken by rapids and the great Paulo-Afonso falls, the stream has long been, and still is, an important connecting link between north and south Brazil. It appears an exaggeration, however, to call it "the cradle of Brazilian civilization," as Normano does.[2]

Most of Brazil Is Tropical

About 93 per cent of the Brazilian area is in the tropics. The bulk of the territory lies between the Equator, which touches the northern mouth of the Amazon, and the Tropic of Capricorn, which passes through the city of São Paulo. The southern states of Paraná, Santa Catarina and Rio Grande do Sul have a temperate climate, with frosts in winter and high temperatures in some sections in summer. Light snowfalls occur in the higher parts of Rio Grande do Sul. During the winter months (which are the reverse of the Northern Hemisphere seasons) cold air currents from the Antarctic bring down the temperatures as far north as the Amazon. During the summer the heat of the coastal areas is moderated by steady trade winds, and in the interior the altitude of the highland regions of Minas Gerais, the

2. J. F. Normano, *Brazil: A Study of Economic Types*, University of North Carolina Press, Chapel Hill, 1935, p. 7.

Goiás–Mato Grosso plateaus and the uplands of the northeast partly offset the effect of the low latitudes.

Generally speaking, the highest temperatures are not found in the Amazon Valley, although the highest officially recorded temperature in Brazil was 110.8° F. at Rio Branco, capital of Acre Territory, far in the interior. At Manaus the maximum recorded is slightly under 100° F. and the minimum 64.6° F., with the annual average around 80° F. The highest annual average (above 82° F.) centers about the interior of Ceará State. High temperatures (above 100° F.) are also recorded in the interior of Bahia and Goiás, southeast Mato Grosso, northeast São Paulo, west central Rio Grande do Sul and at various points along the coast south of Cape São Tomé.

In the equatorial regions the temperature variation within twenty-four hours (up to 15° F.) is greater than the difference between the average temperatures in the hottest and coldest months of the year.

Rainfall Varies Widely

On the whole Brazil is well watered. Indeed, the Amazon Valley is the world's largest area of tropical rain forest. More than eighty inches a year fall in the upper Amazon and around its estuary—where at some points the rainfall reaches 125 inches a year—as well as in a few other spots, such as around São Luís (Maranhão), in western Paraná and in the coastal mountains of the southeast. Over most of the remaining area rainfall ranges between forty and eighty inches.

Rainfall is irregular and frequently deficient in a triangular area of the northeast, embracing the central parts of the states of Rio Grande do Norte, Paraíba and Pernambuco and parts of the states of Bahia and Alagoas. Occasional severe droughts in this region forced large migrations to the coastal cities and to the Amazon Valley during the last quarter of the nineteenth century. The people from

this section played an important part in the settlement and development of the Acre Territory during the rubber boom. The failure of the rains has also been a factor in the migration of many thousands from the northeast to the southern and eastern states, especially to São Paulo, during recent decades. Occasional floods in this region are almost as devastating as the *sêcas.*

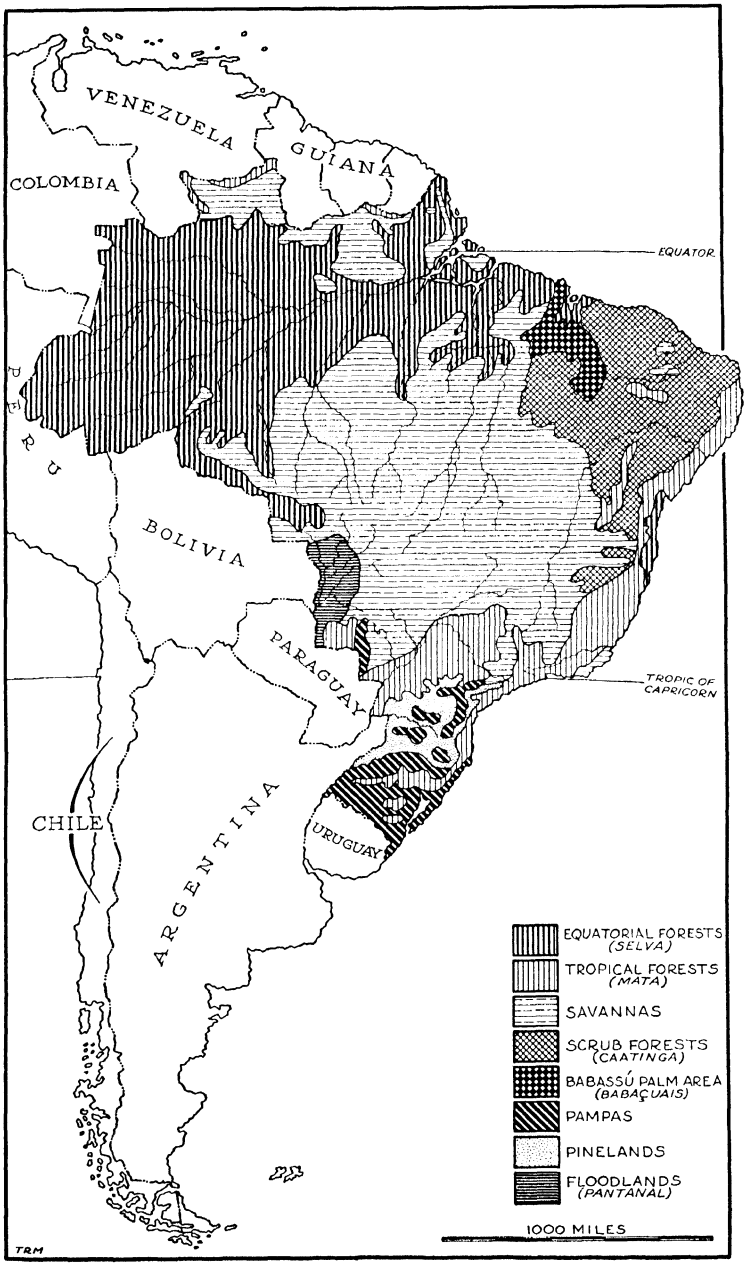
Rainfall is heaviest during the summer months in the larger part of Brazil, from the Amazon southward to central Paraná, and including the coast of São Paulo, Rio de Janeiro and Espírito Santo. Autumnal rains prevail north of the Amazon, around the estuary and in a deep coastal zone across the northern states to Natal. From Natal south to southern Bahia the heaviest rainfall occurs during the winter. In the southern states rainfall is fairly well distributed throughout the year.

The Forests of Brazil

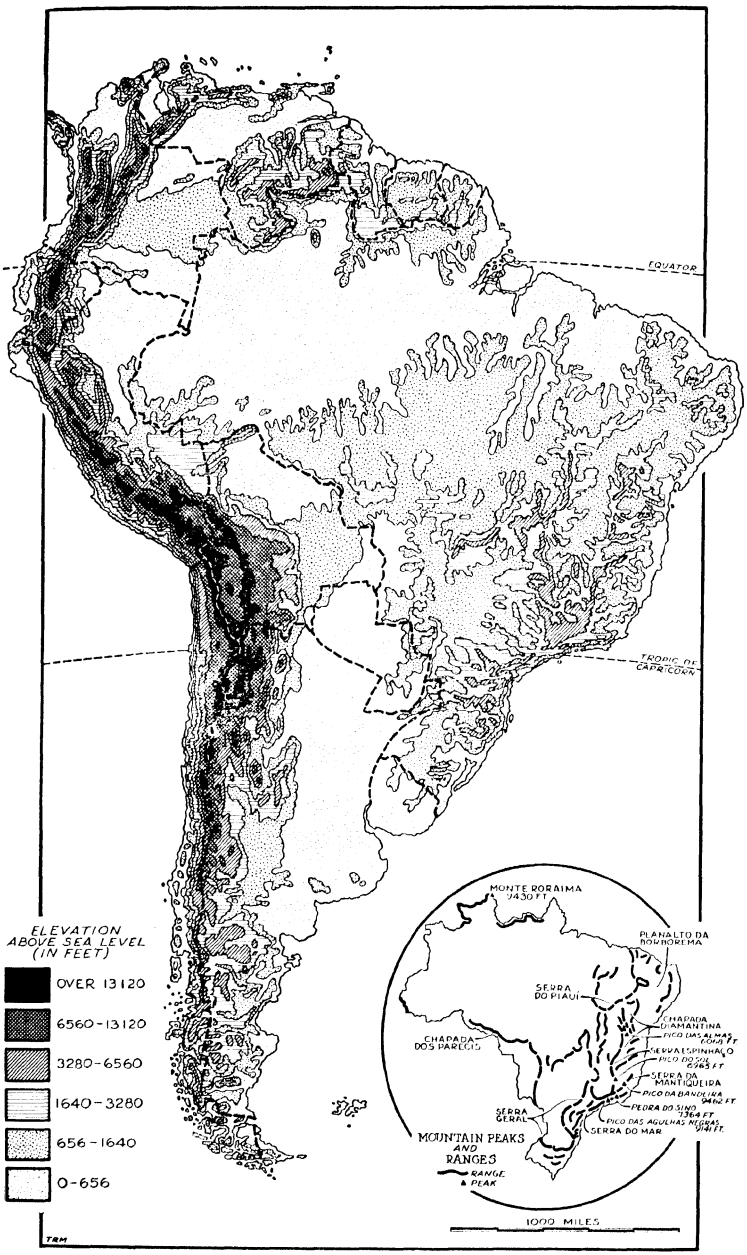
The natural vegetation of Brazil bears a close relationship to the type of climate in the area. Geographers indicate six or seven principal vegetation zones in Brazil: equatorial forest, or selva; tropical forest (*mata*), including semideciduous areas; pinelands; scrub forests (*caatinga*); savannas, with and without scattered trees (*campo limpo* and *campo cerrado*); pampas, or prairies; and floodlands (*pantanal*). Some authorities add an eighth category, the *babassú* palm area (*babaçuais*) in the states of Maranhão and Piauí. (See map.)

The equatorial forest is found chiefly in the Amazon basin, but also in the coastal areas of Maranhão and Bahia south of Salvador. This consists of a heavy growth of broadleaf evergreen trees, with or without undergrowth. Here and there the dense cover is broken by stretches of grasslands, or *campos.* The wide variety of flora includes numerous types of trees and plants of high commercial value, but they are normally so scattered that they cannot be utilized

Vegetation Zones



Physical Contours



economically. The rubber tree has been and still is the most important factor in the development of the Amazon region. Other important items are the Brazil nut, hardwoods, and fruits and nuts utilized for oils or flavors. The upper Amazon Valley is also the original home of the cacao tree, and small quantities of cacao beans are still produced. The total area of cultivated crops is relatively small.

The principal area of tropical forest is the Atlantic coastal belt extending from Rio Grande do Norte southward to Rio Grande do Sul and thence in a narrow band across the central part of that state; also areas in western São Paulo, Paraná and Bahia. In most of this region the original forests were of a semideciduous type, but in some places along the coast where high temperatures and heavy rainfall prevail, selva predominates. The mata in the northeastern states was cleared early in the colonial period and the land was planted to sugar; in the southeast, the original cover in the Paraíba Valley and southern Minas Gerais was replaced by coffee plantations. One of the largest areas where this type of forest is still relatively intact is in the valley of the Rio Doce.

Scrub Forest Lands

In the northeast, the *zona da mata* extends only about fifty miles inland. Where this zone of dependable rainfall ends, the area of deficient rainfall known as the caatinga or *sertões* begins, occupying the wedge-shaped area already described in the section on rainfall.[3] Most of the natural

3. The great epic of this region is *Os Sertões* by Euclides da Cunha, recently published in English as *Rebellion in the Backlands* (translated by Samuel Putnam, University of Chicago Press, Chicago, 1944). The word *sertão,* singular of *sertões,* is also generally used for the country beyond the constantly shifting railheads and frontier towns of central and south central Brazil, as well as in the northeast. One writer uses the term *sertão* or *região sertaneja* to characterize the zone which lies within a band about 675 miles wide between Maranhão and Natal and extending southwestward across Brazil roughly parallel to the Atlantic seacoast. See Salomão Serebrenick, *Aspectos Geográficos do Brasil* (*O clima, a terra e o homem*), Ministério da Agricultura, Serviço de Informação Agrícola, Rio de Janeiro, 1942, pp. 26 and 27.

vegetation of this region is of the scrub forest type.[4] There are cacti and a great variety of mimosas. Grazing and cotton cultivation have traditionally been principal economic activities. In recent times the products of two native plants have acquired importance: carnauba wax, from a palm which occurs in considerable stands; and oiticica oil, derived from the seed of a tree found in the *galeria* forests that flourish along the streams of Rio Grande do Norte and Ceará. The cashew tree is also abundant. Various fibers, such as *caroá,* are also derived from plants of this region.

Overlapping with the caatinga is the zone of the babassú palm, which flourishes chiefly in the Maranhão plains and along the banks of the Parnaíba River.

Savannas and Grassy Plains

Most extensive of the vegetation types in Brazil are the savannas, covering most of central and west central Brazil. Savannas stretch along the northern border of Brazil, especially on the upper Rio Branco and the region between Surinam and the left bank of the Amazon. The northeastern portion of the island of Marajó, at the mouth of the Amazon, is also covered with grassland and is an important cattle-producing area.

South of the Tropic of Capricorn the savannas and the semideciduous forests (matas) begin to change. In the upland regions subject to frost, the pine forests begin. Patches of prairie also appear, becoming extensive in Rio Grande do Sul, the "gaucho" state.

One of the largest reserves of pine forest in South America

4. In the state of Pernambuco there are fairly well defined zones, as follows: Along the coast is a low-lying sandy tract where coconut palms grow. Next comes a fertile belt known as the mata, which was originally forest but was early cleared and planted to sugar cane. Further inland is the caatinga, with scrub and semideciduous trees. Beyond the caatinga is the *agreste,* covered with bristling scrub, sharp-needled fibrous plants, and the like. Next is the sertão, which is the real backlands; it is dry and leafless in the dry season but green and lovely after the rains. Owing to the higher altitude, it is cooler, especially at night, than the coast. As a backdrop to the sertão are the central highlands.

is found in southern Brazil, in the cool highlands of Paraná, Santa Catarina and Rio Grande do Sul. This is the picturesque Paraná pine (*Araucaria brasiliana*), which provides the basis for important lumbering and wood-pulp industries. Although not a pine, the *herva mate* tree (*Ilex paraguayensis*), the hollylike evergreen leaves of which are the source of one of the most popular beverages in South America, grows among the pine trees and is also found in southern Mato Grosso.

Pantanal is the name given to the low-lying grassy plain in Mato Grosso between the Paraguay River and the western edge of the great plateau. It is not strictly a swamp, although a large part of the area is covered with water when heavy rains swell the rivers.[5]

The People and Their Towns

The population of Brazil is about equal to that of the nine other South American republics combined. With an estimated total of 47.2 million inhabitants at the end of 1946, Brazil exceeds Italy and France and nearly equals the United Kingdom.

During the nineteenth century Brazil grew much more slowly than the United States, but in recent decades the roles have been reversed. The Brazilian population is increasing at the rate of one million a year. The age distribution of the Brazilian population, which is one of the youngest of any important country, indicates that this rapid growth will continue for some time. Experts estimate the birth rate at 42 or 43 per thousand (as compared with the 1944 census figure of 20.2 in the United States) and the death rate at 21 or 22 per thousand (10.6 in the United States), although satisfactory statistics are admittedly lacking.

Brazil's population is still small in relation to its vast territory. On the basis of the 1940 census, the density was

5. For further geographical details, see Preston E. James, *Latin America*, Odyssey Press, New York, 1942, and Clarence Jones, *South America*, Henry Holt and Company, New York, 1930.

12.5 persons per square mile, as compared with 44 in the United States and 366 in Italy. In Argentina the figure is about the same as in Brazil. There are, however, several South American countries with lower population density.

Population Heaviest Along the Coast

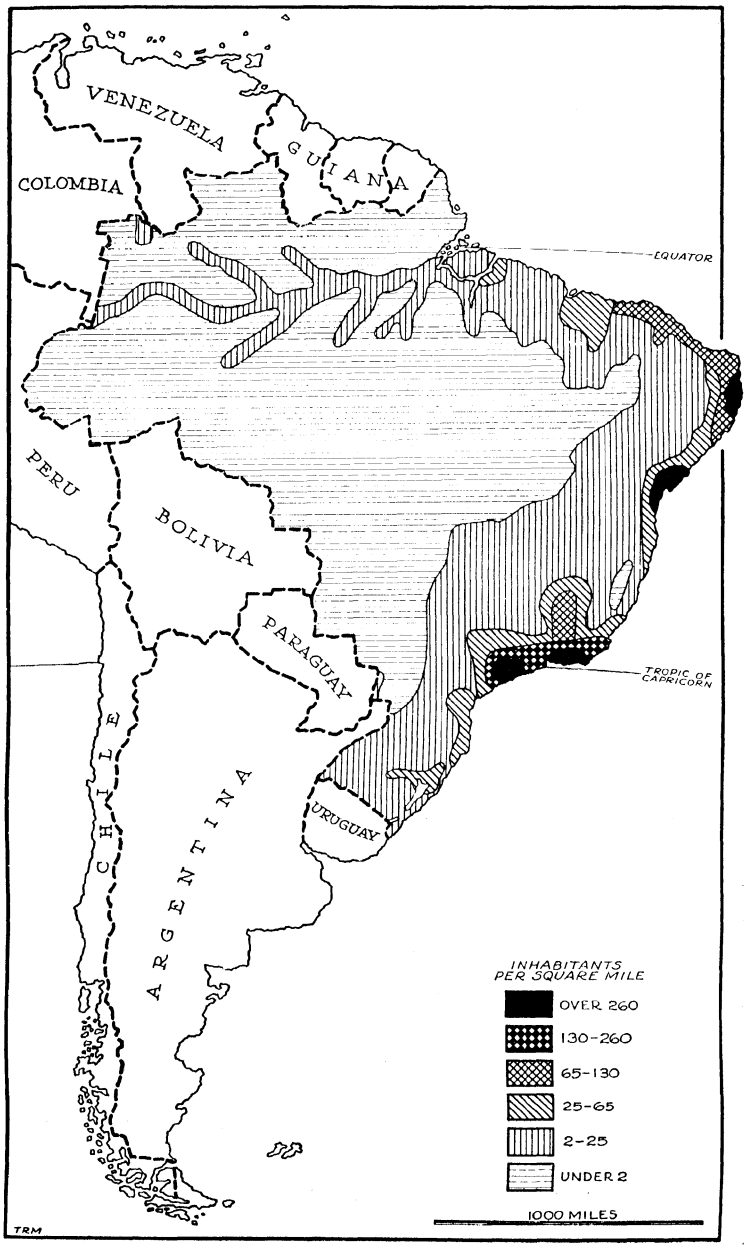
A glance at a demographic map shows the extent to which the Brazilian population is concentrated on or near the Atlantic Coast. Of the eleven cities having a population of over one hundred thousand, only three are not deep-water ports—São Paulo, which is less than fifty miles from the coast, Curitiba (Paraná), also near the coast, and Belo Horizonte, slightly over two hundred miles from tidewater.

In the old, long-settled states of the northeast and the southeast, the population density is fairly high, but the Amazonian basin, which embraces half the area of Brazil, has a population of less than two million, or a density of one per square mile. The population density is even lower in the state of Mato Grosso, which is nearly twice the size of Texas.

There are three principal areas of population concentration. The first is the southeast, embracing the Federal District (which consists chiefly of the city of Rio de Janeiro), the surrounding state of Rio de Janeiro and the adjacent states of São Paulo and Minas Gerais.

The second area is the northeast, from the Bay of Todos os Santos (Bahia) north to Natal. This was the first part of Brazil to be settled on an important scale. Salvador (Bahia) was the colonial capital until it was moved to Rio de Janeiro in 1763, following the decline of the sugar industry and the shift of population to Minas Gerais as the result of the discovery of gold and diamonds around 1700. The supremacy of the south was confirmed by the spread of coffee culture in the states of Rio de Janeiro, Minas Gerais and São Paulo. Although the northeast has continued to show population gains at each census since 1890, the in-

Population Density



crease has been less than in the southern and the west central areas. Since the 1930's there has been a heavy internal migration from the dry sertão regions to São Paulo and adjacent regions that is comparable to the gold rush of the early eighteenth century.

The third center of concentration is in the three southernmost states, the old settlements being along the coast, up the valleys and on the near-by highlands. The largest cluster is at Pôrto Alegre, at the head of the Lagôa dos Patos, which has become an industrial center and one of the three or four largest cities in Brazil. The rural area back of Pôrto Alegre has been settled during the last century by thrifty small farmers and their numerous descendants, chiefly of German stock but seconded by Italians and, in the rice area along the Rio Jacuí, Portuguese. Since 1920 the northwestern portion of the state has been settled by the overflow from the earlier colonies. In Santa Catarina around Joinville, Itajaí and Blumenau the German influence is relatively stronger than in Rio Grande do Sul; here, too, the settlements are spreading westward. Adjoining Santa Catarina to the north are other clusters in southeastern Paraná, with some German stock but more Slavs—Poles, Russians, Ukrainians and Ruthenians.

Growing Importance of São Paulo

The most significant development in Brazilian history during the past seventy-five years has been the growth in population and economic power of the state of São Paulo. While São Vicente (near Santos) is the oldest Portuguese establishment in Brazil, and permanent settlement was made on the highlands at Piratininga (the present city of São Paulo) as early as 1554, it remained a relatively poor and sparsely settled area until the middle of the nineteenth century, when coffee planting and the beginning of European colonization touched off expansive forces.

The population of the state of São Paulo grew from 837,000 in 1872 to 7,180,316 in 1940, and the city of São

Paulo from around 30,000 to 1,300,000. A large part of the increase was due to immigration, since São Paulo received 50 per cent or more of all immigrants entering Brazil. While São Paulo continues to grow—by natural increase, by internal migration and by a small trickle of immigrants—percentagewise its population is increasing less rapidly than the states of Paraná and Santa Catarina to the south and Mato Grosso and Goiás to the northwest. All of these areas (except Santa Catarina) depend on São Paulo cities as markets and as purveyors of manufactured goods, and are in a sense extensions of the São Paulo territory.

Shifts of Population

The settlement of new areas in Brazil has been partly at the expense of older sections. The instability of the population patterns results from the successive rise and decline of new sources of wealth, the exhaustion of the soil and the nature of land tenure and social organization. The westward march of coffee culture as old areas have become exhausted resembles the shifts in cotton cultivation in the United States from Virginia and the eastern states across the South into Texas and the Far West.

During the early part of the nineteenth century the Paraíba Valley was the main coffee district and one of the chief wealth-producing regions of Brazil. Today the denuded hillsides bear witness to an abandoned glory. During the early years of this century Ribeirão Prêto in north central São Paulo was the coffee capital, but since then new regions to the west and in northern Paraná have been developed. Census records show a decline in the population of much of the eastern part of São Paulo. Decayed towns and relics of once important settlements are to be found in many parts of the country, even far into the interior. Abandonment was due in some cases to a desire for healthier altitudes but more frequently to exhaustion of the soil or of mineral resources, or to changes in transportation methods and routes.

Two Typical Cities

Brazil has a distinct personality that sets it off from Europe, the United States and the Spanish American republics. Different regions and subregions have distinctive characteristics of their own, though the country as a whole has a degree of cultural homogeneity which is surprising in view of the varying geographic, racial and historical backgrounds of the different sections and the large degree of political and economic autonomy the states have enjoyed in the past.

The regional variations, as well as the similarities, are brought out by a comparison of the two cities of Belém, the metropolis of the north, and Pôrto Alegre, the first city of Brazil's southernmost state. Belém, with its feet in the water, lies just below the Equator at one of the mouths of the Amazon River. Pôrto Alegre, in the state of Rio Grande do Sul, lies two thousand miles south of Belém by direct airline, and is in the temperate zone. Each city owes its rise to the fact that it serves as the focus of an important network of rivers and internal waterways.

Belém is older, and until the 1930's was the larger of the two cities. Belém's golden age was in the period of the Amazon rubber boom. It lost population during the second and third decades of the century, but its strategic location at the mouth of the Amazon and its growing importance as an air and ocean port have enabled it to stage a comeback.

Pôrto Alegre has had a slower but steadier growth, with a particularly rapid spurt during the last two decades, bringing the present population of the city proper up to about 300,000 as compared with Belém's 250,000.

Belém was founded in 1613. Except for a few old churches, most of the present city is modern, but the moist, tropical climate gives it an atmosphere of age and mellowness, which is enhanced by the luxuriant tropical vegetation of its gardens and parks and the dark green of the mango trees which line the streets and provide an extra hazard for

passers-by during the fruiting season. Owing partly to tradition and partly to the nature of the site, Belém is compactly built (part of the city was subject to periodic inundations until the second world war, when dikes and drainage canals were built by American agencies), while Pôrto Alegre has thrown out a number of attractive garden suburbs along the river front and into the foothills of the Serra do Mar.

In both cities, a number of modern apartment houses and office buildings have been erected, ranging up to eight stories in Belém and as high as fourteen in Pôrto Alegre. In both cities, however, the majority of buildings are of the traditional Mediterranean type: one or two stories high, faced with yellow stucco, with heavy entrance doors and windows opening onto the narrow sidewalk. In Belém the Portuguese influence is more directly evident than in any other Brazilian city. The street fronts of many of its one- and two-story buildings are faced with tiles, the use of which was taken over by the Portuguese from the Dutch. In practice this style appears to have been preserved primarily for the practical reason that such buildings do not require frequent repainting and repairing, but the tiles used are less colorful than in Mexico and other Spanish American countries.

Differences in climate, occupations and standards of living are reflected in the dress of the people of the two cities. Pôrto Alegre is hotter in summer but much colder in winter. In both cities, cotton or linen clothing is worn during much of the year, but in Rio Grande do Sul woolen clothing is needed during the winter months. Rio Grande do Sul is predominantly a cattle state, and the cowboy dress of the gauchos is in evidence.

The standard of living is higher and wealth is more widely distributed at Pôrto Alegre; there are many small industries and some large plants; farmers are thrifty; soils are richer and techniques more advanced than in the north. In the south, one sees fewer beggars and street hawkers, who at Belém peddle anything from sweets and aphrodisiacs to

leopard cubs and boa constrictors. Both cities have municipal markets; but the neat stalls at Pôrto Alegre lack the picturesque disorder of the Belém market, which spills over into the streets and along the docks. In Belém one may find a bizarre assortment of merchandise—nuts, herbs, orchids, birds, baskets, hammocks, products of native crafts, culled by native traders from the vast labyrinth of waterways and trails converging on the city.

The Amazon Valley is the last stand of the aboriginal Indians, who now number only a few thousands. But Indian blood has entered much more freely into the racial mixture in the north than in the south, and Negroes are also more numerous. Before the second world war some thousands of Japanese also settled in the valley. At Santarém, 590 miles above Belém by water, are the last survivors of the original families of Confederate veterans who settled there after the United States Civil War.

At Pôrto Alegre the influence of a century of German colonization is evident in the physiognomies of the people and in the dress, houses, shops and customs. German is still widely spoken in Pôrto Alegre, and the language of a large part of the small farmers of the state is a corrupted speech, two-thirds German and one-third Portuguese. However, Italian influences have been almost equally important, and Spanish and Portuguese settlers are numerous.

But the acculturation of alien elements has gone forward steadily, and life in both Pôrto Alegre and Belém has been fitted into the Brazilian mold. The fact that both cities are state capitals and have close relations with the federal capital tends to promote a common outlook. President Vargas was a native of Pôrto Alegre and brought many gauchos into the federal administration.

The Larger Cities

Of the larger cities of Brazil, each has its own peculiar charm which makes it in some respects unique, while at the

same time retaining the common Brazilian idiom. During the nineteenth century and the early part of the twentieth, city planning and public architecture were strongly influenced by French models. In Rio de Janeiro, Avenida Rio Branco was cut through a tangle of narrow streets and dingy buildings after the manner of the Avenue de l'Opéra in Paris, and most of the buildings which originally bordered it, as well as the imposing Municipal Theater at one end, were of French inspiration. Since the first world war, the ornate French style has given way to ultramodernistic buildings which architecturally and structurally derive in part from modern French influences as well as from central and northern Europe. (The *nouveaux riches* of the pre–World War I era, in erecting their palaces on some of the finest boulevards of Rio and São Paulo, at times built grotesque versions of the Moorish, Rhenish, English, Tyrolean and other styles, as well as a fair sprinkling of palaces of classic proportions.)

São Paulo, capital of the state of the same name, has borrowed widely for its architectural styles as well as absorbing a variety of peoples. The historic center of the city, a triangle of high land that formed an easily defended fortress during the troubled sixteenth and seventeenth centuries, is now the citadel of finance and big business and from here a large part of Brazil's industrial and commercial enterprises are directed. Fittingly enough, its tallest building, perhaps the highest in South America, is the thirty-six-story office building of the Banco do Estado de São Paulo.

Like most Brazilian cities, São Paulo is irregular in outline, because of the irregular contours of the terrain, but most of the suburbs are connected with the center of the city by broad avenues. At São Paulo, as elsewhere in Brazil, the old one-story yellow stucco buildings, as well as the more imposing two- and three-story Frenchified mansions, are giving way to modern skyscraper hotels, apartment houses, hospitals and office buildings. But the *Paulista* pace

is more rapid, and the buildings are higher, than is usual in Brazil, resulting in a greater contrast between the old and the new. There is also a sharp contrast between the superb residential suburbs and the belt of factories and workers' quarters which nearly surrounds the city.

In no Brazilian city has the recent enthusiasm for sports been carried further than in São Paulo. Its municipal stadium, designed especially for soccer, is one of the finest in the Americas. São Paulo also has a race track, a boating club and golf links. No city of Brazil presents such an animated scene on Sunday morning as the old triangle of São Paulo. Crowds surge through its narrow streets going to or returning from the various churches in this section; the coffeehouses are crowded, and groups gather before brokers' offices, lottery vendors and newsstands. There are many attractive tearooms and cafés. The opening of the new motor highway to Santos has resulted in swelling the crowds on the Santos beaches and promenades over the weekend. Bathing, sun-bathing and beach sports have grown in popularity all along the Brazilian littoral.

Municipal transport deteriorated during the war, although enough new modern buses have since been received to alleviate the situation. The streetcars are of the open type, and almost as many passengers cling to the running boards or find standing room on the front and rear platforms as are able to find seats. The *lotação,* or jitney, does a roaring business on the crowded streets of Rio and Copacabana. Only in Rio and São Paulo, however, is the number of motor vehicles sufficient to present a serious traffic problem.

The smaller towns of Brazil retain much of the Mediterranean stamp imprinted by generations of Portuguese, Spanish and Italian settlers. The climate of a large part of Brazil also favors the Mediterranean type of life. But there are variations from the norm on the frontiers, in the north and in the south, owing to the strength of non-Latin or non-

European influences, or the weight of geographic circumstances. Communities in the Amazon Valley not touched by international shipping services illustrate the differences.

A Small River Town

Abaetetuba, a place of three thousand inhabitants near the junction of the Amazon and Tocantins rivers, is a fairly typical river town. Approached by water (no highways or railways reach it), most of the town is hidden by the enveloping jungle. There is a wooden jetty, a sawmill at the left and a row of wooden stores along the water front to the right. The tide here rises ten or twelve feet, so that embarking or disembarking at low tide involves some agility. The stores along the boardwalk offer cotton cloth, rope, oars, knives, skins and leather goods, dried beans, brown sugar, manioc meal, beer, soda pop, and great slabs of dried fish stacked on the floor.

When the author visited Abaetetuba, only one motor vehicle, a truck belonging to the sawmill, was to be seen, and wheeled vehicles of any kind were rare. Most of the transport is handled by burros and humans. The streets are overgrown with grass. All buildings are of wood, except a church and two stuccoed buildings. Windows are fitted with solid wooden shutters; the only window glass is in the transoms of the city hall, a one-story frame building with a wide porch. The town has a wood-burning electric plant, a shoe factory, several tile and earthenware factories, a rice-cleaning mill, a sugar mill, alcohol distilleries and a vegetable oil mill.

Although three hundred years old and politically classified as a "city," Abaetetuba had no water or sewage system before the war. Hence it is not surprising that 80 per cent of the inhabitants were infested with worms. During the war, SESP, a public health service established jointly by the

A public health center was also established to continue the work of educating people in sanitation, diet and the care of children.

Portuguese Racial Stock Dominant

Although the Portuguese racial stock and culture provide the basic framework for Brazilian civilization, there has been considerable admixture from other peoples. During the colonial period there were long struggles with the Dutch, French and Spanish before the Portuguese became firmly established in their possessions. Yet all of these nationalities left racial and cultural influences, and in addition there was considerable infiltration of Italians, Irish, English and Germans.

At the time of the arrival of the Portuguese in 1500 they encountered several tribes of native Indians at a low stage of cultural development—variously estimated at from one to three million. The first settlers, predominantly male, promptly mated with the Indian women. The male Indians who could be captured were enslaved to work on the sugar plantations or to look after the cattle. The growing need for laborers gave rise to an organized business of rounding up Indians to be sold as slaves. The *mamelucos,* half-breed descendants of Indians and whites, were particularly active in this business. The hardy pioneers of São Paulo began the famous forays known as *bandeiras,* which resulted in the destruction of the Spanish Jesuit missions east of the Paraná River and the extension of Portuguese territory to the southwest and the north.

The importation of African slaves began as early as the sixteenth century. On the eve of independence (1822) it was estimated that about half the population of around 3.8 million was black. Several million had been brought into the country before the traffic was finally stopped around 1850. At the present time Negroes represent 15 per cent or less of the population and mulattoes perhaps as much as 20 per cent.

Immigration: 1840-1940

Free immigration has never been as important in Brazil as in the United States or even Argentina, but during the century from 1840 to 1940 it is estimated that 4.8 million immigrants entered the country, of whom about 70 per cent, or 3.3 million, remained. During this same period the United States received 38 million immigrants, of whom probably 25 million remained. The increase in Brazilian population during that century directly due to immigration was 9.4 per cent, as compared with 21.8 per cent in the United States.[6] Immigration did not begin on a really important scale until the late 1880's just preceding the abolition of slavery (1888) and the establishment of the Republic (1889). An all-time high point was reached in 1891 with 215,329 arrivals. There was some recession toward the close of the century, but in 1913 the second high peak, 190,000, was reached. In no subsequent year did the annual increase exceed 100,000 except in 1926, when it amounted to 118,686. Following the enactment of restrictions, beginning in 1930, immigration declined drastically; it was further reduced by the outbreak of the second world war. In the six years 1940-1945 the annual inflow averaged 20,102, of whom an average of 8,475 remained in the country.

Immigration Restrictions

Immigration and employment restrictions were originally enacted at the end of 1930, shortly after the accession to power of President Vargas, to relieve unemployment during the depression. These controls have been consolidated and strengthened as instruments for accelerating the nationalization of labor, favoring native Brazilians in employment and colonization opportunities and preventing the formation of population nuclei that are not readily assimilated. Since 1934 immigration has been limited by an annual quota of 2 per cent, based on the national origins

6. Giorgio Mortara, *Estudos brasileiros de demografia,* Fundação Getúlio Vargas, Monografia No. 3, Rio de Janeiro, July 1947, Vol. 1, pp. 19 and 20.

of the Brazilian population. This theoretically permits an immigration of about 80,000 a year. The quota has been liberalized for some nationalities, but in practice many of the quotas are not filled.

The immigration law now in force is based on the principles of "developing the more convenient characteristics of European ancestry in the ethnic composition of the population" and "protecting the interest of the Brazilian worker" (Decree-Law No. 7967 of September 18, 1945). In recent years a high degree of discretion has been allowed to the National Immigration and Colonization Council in administering the immigration laws and promulgating regulations.

Brazilian regulations tend to restrict the entry of persons who intend to accept employment or engage in business, unless they have some capital to invest in agricultural or industrial enterprises. The practice of the professions, including accountancy, is reserved to Brazilians, except for those already qualified at the time the restrictions became effective. Foreign companies are allowed to bring in some technicians, principally on a consultant basis, when qualified Brazilians are not available.[7]

Italian Immigration Heavy

The influx during the past seventy years has appreciably modified the composition of the population and has introduced many new cultural and economic influences. An overwhelming proportion of the immigrants have come from the Latin Mediterranean countries. Data for the period 1884-1939 show that during this period 1,412,263 (34 per cent of the total) arrived from Italy. Italian immigration was heaviest during the closing decades of the nineteenth century. In 1902 the Italian government prohibited the recruiting of immigrants in that country as a protest against the treatment of immigrants by São Paulo landowners. However, Italian immigration continued fairly large even thereafter. The Italians went chiefly to the state of São Paulo,

7. See Chapter 9 for further discussion of this matter.

but also in substantial numbers to Rio Grande do Sul, Santa Catarina, the Federal District and Espírito Santo.

Spanish immigration (581,718, or 14 per cent) was also heavy during the 1890's but it reached its peak during the years 1901-1913. The Spanish went principally to the states of São Paulo, Rio de Janeiro, Minas Gerais and Rio Grande do Sul.

Immigrants from Portugal (1,204,394, or 29 per cent) constituted the largest national group during the entire period 1904-1939, except during the years 1905-1907, when they followed the Spanish, and the years 1932-1935, when they were second to the Japanese. The peak was reached in 1912 and 1913. Generally speaking, the Portuguese have gone to the cities rather than to the rural districts. The Portuguese influence is perhaps strongest in Belém (Pará).

During the 1884-1939 period there were 32,372 French immigrants (0.8 per cent). The French also have gone principally to the large cities.

Japanese immigration, totaling 185,795 (4.5 per cent), was fourth in order of size. The heaviest Japanese movement was during the years 1926-1934. The largest number of Japanese have gone to the state of São Paulo, but there are some thousands in adjacent states and a sprinkling in the Amazon Valley, where they played a large part in establishing jute production. The total number of Japanese in Brazil is estimated at slightly over 200,000.

German-Speaking Peoples Second to Latins

The German-speaking peoples are probably second only to the Latins in permanent influence in the country and in the number of their descendants, although the Slavic races probably exceed the Germans in number of entries. One of the earliest German-speaking colonies to be established in Brazil was a group of Swiss who settled Nova Friburgo in the state of Rio de Janeiro in 1818. During the period of the Empire German-speaking immigration was encouraged. The first German settlement in Rio Grande do Sul was in

1824 at São Leopoldo. This and subsequent German settlements in that state flourished and sent out offshoots to take up lands in other sections. In Santa Catarina, Joinville was established in 1851 and Blumenau in 1852. Other German settlements were made in Espírito Santo, São Paulo, Bahia, Pernambuco and elsewhere. The German influence is also strong around Curitiba, the capital of the state of Paraná. A considerable number of Germans arrived between the two world wars, both as individuals and in groups. The number of persons of predominantly German stock in Brazil is estimated at around 800,000, of whom about 520,000 are in Rio Grande do Sul and 225,000 in Santa Catarina.

Austria has supplied 85,000 (2.1 per cent), but it is likely that a substantial portion were Hungarians and Slavs from the Austrian Empire as it existed before the first world war. The official record shows the following entries of Slavs: Russians, 109,502 (2.6 per cent); Poles, 47,765 (1.1 per cent); and Yugoslavs, 23,125 (0.6 per cent). It is likely that a substantial portion of those recorded as Russians were actually Poles. The peak of specifically Polish immigration occurred in 1929. Polish influence is particularly strong in Paraná and there are also a considerable number of Poles in Rio Grande do Sul.

The immigration from Turkey (78,455, or 1.9 per cent) and Syria (20,507, or 0.5 per cent) was small but important. The Syrians are particularly numerous in the city of São Paulo, where many have become wealthy in commerce and in textile manufacturing. There are scatterings of Syrians in the cities of Minas Gerais, Mato Grosso and the Amazon Valley. In the interior of the country the Syrians get their start as itinerant peddlers.

Official statistics show the entry of 8,555 Hungarians, but it is probable that there are some 30,000 Hungarians in the country. Part of these are Christians who left Hungary to seek better opportunities or as a result of political persecution, and part are Jews.

English-speaking immigrants have been few. "England" (probably including Ireland and Scotland) sent 23,745 persons. There are probably close to 10,000 British subjects residing in Brazil.

Few Immigrants From the United States

The United States is credited with 12,661 immigrants from 1884 to 1939. In addition, of the eight or ten thousand persons who left the southern states after our Civil War, about three or four thousand established homes in Brazil. The largest nucleus was at Vila Americana, near the city of São Paulo; others settled at Santarém on the middle Amazon and in the state of Espírito Santo. Most of these intermarried with Brazilians and lost their identity. Two prominent Brazilians, known to the author, are direct descendants of one of these Southerners, but they currently use their Brazilian mother's name. Consular records showed four thousand United States citizens resident in Brazil in 1940. During the war years United States citizens followed the Portuguese as the most numerous national group entering Brazil, but the total number was only a few thousand. Most Americans have engaged in commerce, industry or teaching or have been employed as technical advisers by Brazilian agencies.

There have also been some immigrants from South American countries having common frontiers with Brazil, such as Uruguayans, Paraguayans, Bolivians and Peruvians. In recent times Paraguayans entering Mato Grosso have probably been the most numerous group of South American immigrants. Doubtless there have been considerable numbers who have slipped across the border without bothering about registration formalities.

Jewish Immigration Discouraged

There are probably close to a hundred thousand Jews in Brazil, principally in Rio de Janeiro and São Paulo, followed by Belém and Recife. During colonial times a large number

of Jews found asylum in Brazil, where the inquisition was never firmly established. Sephardic Jews entered the country during the second half of the nineteenth century. After the first world war there was a considerable influx of the Sephardim from the Near East and North Africa. Some thousands of Jews from central and western Europe poured in after the rise of Hitler and again following the fall of France, despite the imposition of restrictions in 1938.

Many of the refugee Jews now in Brazil probably originally entered on tourist or temporary visas and later "adjusted their status," through the payment of high fees. There was a period after the fall of France when a few Brazilian Consuls in Europe, either for humanitarian or financial reasons, aided Jews in their attempt to find a refuge. Some were even given diplomatic visas. The Brazilian government later attempted to put a stop to these practices. During the summer of 1941, a group of eighty refugees with Brazilian diplomatic visas on board the *S.S. Cabo de Buena Esperanza* were refused disembarkation at Rio de Janeiro.

The position of the Jews under the immigration regulations is not clearly defined, but there is reason to believe that visas are forthcoming only under exceptional circumstances and that most applications for entry must be referred to Rio de Janeiro for decision. Generally speaking, would-be Jewish immigrants do not fall within the national or occupational categories Brazil is anxious to encourage. Brazilian laws, regulations and official pronouncements make it clear that the immigrants desired primarily are (1) farmers or farm laborers, and (2) technicians who will supply needed skills and at the same time will readily become Brazilianized. The opposition to Jews appears to be based on the feeling, first, that they are not readily assimilated and, second, that they settle in the cities where they engage in commerce and speculation. Doubtless there is also a feeling in some circles that Jewish immigrants may include some Communists and agitators. There has long been some prejudice against Jews,

but it did not manifest itself very strongly until, first, the Jews began to enter the country in numbers and, second, anti-Semitism was stirred up by the Germans.

Position of Negroes and Orientals

The opportunity of Orientals and Negroes to immigrate is generally similar to that of the Jews. Since they are not "of European ancestry," as provided for by Decree-Law No. 7967, it appears likely that they would be refused permanent or immigration visas, although tourist and temporary visas might be granted in exceptional cases.

As in other Latin American countries, the Brazilian attitude toward Orientals has changed from time to time. They were definitely excluded under the Empire, but the ban on Japanese was later lifted as a result of the pressure of the Paulistas, following the slowing down of Italian immigration. According to statements published in official organs, one of the purposes of the immigration quota was to reduce drastically the influx of the Japanese and other races who experience had shown could not be readily assimilated. At present it would probably be very difficult for a person of Japanese ancestry to obtain a visa to go to Brazil, even as a visitor, although some authorities are anxious to bring in up to five hundred Japanese families to assist in the development of jute culture in the Amazon Valley.

Racial Divisions

The distribution of the Brazilian population by color according to the 1940 census was as follows: whites, 26.2 million, or 63.5 per cent; *pardos* (literally "brown," that is, mulattoes or mixed bloods), 8.8 million, or 21.2 per cent; *pretos* (black), 6 million, or 14.7 per cent; and yellow, 0.25 million, or 0.6 per cent. These distinctions doubtless depend primarily on the manner of life and the declarations of the persons interviewed, rather than on ethnical technicalities. One authority gives a slightly different classification: whites, 25 million, or 60 per cent; mulattoes (20 per cent) and

caboclos[8] (10 per cent), 13 million, or 30 per cent; Negroes, 4 million, or 8 per cent; and Indians, 1 million, or 2 per cent.[9] At the time of the first national census in 1872 the whites comprised only 38.1 per cent of the population. Perhaps the data are not strictly comparable, but it is evident that there has been a considerable "whitening" of the population as the result of European immigration, the stoppage of the slave traffic and the preference of colored women for white mates. Possibly white mortality is also lower.

Tolerance

There is a large measure of "racial" and color tolerance in Brazil, partly growing out of the Portuguese heritage and partly as the result of greater moral tolerance, especially with respect to sexual relations. But it would be a mistake to assume that Brazil is lacking in racial and color consciousness. For one thing, the immigration regulations definitely tend to exclude certain races from entry into the country. Negroes and dark mulattoes are effectively barred from some branches of government service, and can hope to reach only the lower grades in others. Many hotels and clubs draw a sharp color line. Even large sports clubs whose members are recruited from the lower middle class make distinctions. There are fewer social distinctions than in the United States but there are also fewer economic and educational opportunities. Since a large number of the schools, especially secondary schools, are privately operated, there is less occasion for friction than in the United States. In Brazil relations are softened by the general acceptance of class distinctions based on family, wealth and personal achievement, and by a genius for accommodation that has enabled the country to end slavery and to change from colonial status to independence and from monarchy to republic, all without bloodshed.

8. *Caboclo* in this context means a mixture of white and Indian; the term is also used to designate (1) rural laborers, sharecroppers and squatters, and (2) the way of life characteristic of the lower classes in the rural districts.

9. Serebrenick, *op. cit.*, p. 45.

GOVERNMENT

Brazil (Estados Unidos do Brasil) is a republic with a federal form of government modeled in many ways on the United States.

There have been four constitutions since the establishment of the Republic in 1889. The first, adopted in 1891, remained in force until it was suspended on November 11, 1930 by the revolutionary government of Getúlio Vargas. A new constitution was prepared by a constituent assembly and promulgated on July 16, 1934. On November 10, 1937 Vargas dissolved Congress and abrogated the Constitution, governing the country on the basis of "a state of emergency." On the same day there was published a new "constitution," the last article of which provided for a ratifying plebiscite, which, however, had not been held up to October 29, 1945, when Vargas was ousted and a provisional government established under the provisional presidency of the head of the Supreme Court, Chief Justice José Linhares. General Eurico Gaspar Dutra, the present chief of state, was elected on December 2, 1945 and inaugurated as President on January 31, 1946. His term of office is five years. The constitution now in force was drawn up by a constituent assembly and put in force on September 18, 1946.

The Federal Government and the States

In theory, the federal basis of the Brazilian government is similar to that in the United States, that is, the federal government exercises specified powers while the states have general powers. Article 18 provides: "There are reserved to the states all powers which are not implicitly or explicitly forbidden to them by this Constitution." In practice, however, the powers of the federal government are more extensive in Brazil than in the United States. In Brazil, the entire field of civil, commercial, criminal, electoral and labor law falls within the jurisdiction of the federal government. The federal authorities may "intervene" in a state and set

up interventors in place of the elected officials, under certain circumstances. Perhaps most important of all, the federal government controls the chief sources of revenue. In 1940, for example, the Brazilian federal government collected 56.2 per cent of the tax revenues, the states 34.7 per cent and the municipalities 9.1 per cent.[10] In the United States, the same year, the federal government received 34.8 per cent, the states 25.4 per cent and the municipalities 39.8 per cent.

The Constitution provides that the Federal District, which is the seat of the federal government, similar to the District of Columbia, shall be administered by a prefect, appointed by the President of the Republic, and by a legislative chamber elected by the people. The administrative and judicial organization of the Federal District and of the territories (of which there are now five) is regulated by law.

Incidentally, the Constitution provides that the federal capital shall be moved to the "central plateau," and a technical commission is now studying the subject. The military authorities are reported to be strongly in favor of the move, from the standpoint of national security, and there is considerable public sentiment in favor of the change, but no immediate action is probable. The colonial capital was moved from Salvador (Bahia) to Rio de Janeiro in 1763.

In more recent times the capitals of several of the states have been moved. In two instances the change was made from historic towns to completely new "planned" capitals. Belo Horizonte, capital of the state of Minas Gerais and a thriving city of over 200,000, was laid out after the manner of Washington, D. C., just fifty years ago. In 1942 the capital of the state of Goiás was shifted from a fever-ridden town of the same name to a new site called Goiânia.

10. A Brazilian municipality corresponds roughly to a county, parish or township in the United States, since it includes rural areas of varying extent in addition to the urban center or "city." The weak position of the municipalities is reflected in the scant revenues at their disposal, despite constitutional guarantees of "autonomy." The 1946 Constitution contains numerous provisions designed to assure the municipalities larger revenues. See Chapter 10.

Shifting the national capital would involve great expense and tremendous preparations in the form of housing, sanitation, transportation and communication facilities. The move was first proposed as early as 1839, at which time the highlands in which the Tocantins and the Paraná rivers originate (that is, southern Goiás) were proposed as the site. The Constitution of 1891 called for a shift to that site, and the Constitutions of 1934 and 1946 repeated the injunction.

Government Control of Economic Life

In Brazil, government control over the economic life of the nation is more extensive than in the United States, and this gives the federal authorities a strong leverage of political influence as well. For example, the Banco do Brasil, controlled by the federal government, is by far the strongest financial institution in the country and has numerous branches in every state and territory. Its Exchange Department controls practically all imports and some exports as well. The official reinsurance institute has wide powers over the insurance market. Official institutes intervene in the production and marketing of several important products, such as sugar, alcohol, mate, pine logs and lumber. Several of the leading railways, as well as several smaller ones, are operated by the federal government, although some of the states also operate railways within their territory. All legislation relating to minerals, waters, electric power, forestry and natural vegetation, and fishing and hunting, is reserved to the federal government.

The influence of the central government is further enhanced by the system of grants-in-aid to state and municipal governments and to educational, health and charitable institutions.

Brazil, like the United States, has both the advantages and the disadvantages of great size. Distances and diversity complicate the problems of government and efficient administra-

tion. In Brazil, the problem is aggravated by the lack of adequate transportation and communication facilities. Since both nations adhere to the democratic traditions of the Western world, such problems are not amenable to solution (or suppression) by the sole action of any all-powerful central government. In both countries the necessary adjustments are sought by a mixture of local and national powers, of private and public initiative, though in Brazil the economic controls of the federal government are more pervasive.

Chapter 2

THE ECONOMY: OVER-ALL VIEW

Brazilian Economic Evolution

Despite the huge size of the nation and the extent of its underdeveloped resources, Brazil's economic progress has not kept pace with that of the United States and Canada or with that of some of the other South American countries. Its per capita national income is low, even in relation to some of the other large Latin American states. This was not always so, for during most of the nineteenth century Brazil was economically the most advanced South American nation and Rio de Janeiro was the largest city on the continent; but by 1900 Argentina had become the leader in foreign trade and in most lines of economic development. There was much wealth, luxury and culture in Brazil before the English-speaking colonization of North America began.

At successive periods of its history Brazil has occupied the leading position in world production of dyewoods, sugar, tobacco, gold, diamonds, cotton, rubber, cacao and coffee, but it has lost its primacy in all except the last. Each of these periods of great wealth has produced its fine flowers of civilization. Yet enduring achievements, in the form of physical assets or training of new generations, have been disappointing in relation to the size of the country and its apparent potentialities. The reasons for this failure lie both in the nature of the physical environment and in the character of the socio-economic development.

The extractive nature of the first economic cycle, the cutting of brazilwood, has many analogies in the history of other countries. The next cycle, involving the production of

sugar on large estates, with Negro slaves providing most of the manpower, in many respects parallels the evolution of the southern United States. But there are also important differences: in Brazil, slaves were more numerous, and slavery covered more territory and persisted longer. Although Bahia and Pernambuco remained the chief centers of the traffic, slaves were introduced into all sections of the country, even Rio Grande do Sul. The climate and the political setting enabled the system to be extended into Minas Gerais, Rio de Janeiro, the Paraíba Valley and eastern São Paulo, as the mining and coffee cycles succeeded the sugar, tobacco and cotton cycles of the northeast. Not until the middle of the nineteenth century did family-operated farms and small industries get a start from the new current of European immigration, principally in the temperate south.

While slavery prevailed in the rich coastal and river valley lands, the caboclo, offspring of white and native Indian races, determined the character of agriculture in the backlands and on the frontiers. These frontier people open up small clearings in the forest by burning the vegetation, and shift cultivation to new sites as the shallow soil is exhausted.

Although plantations with slave labor were started in Brazil a century before Jamestown or Plymouth were founded, the extensive and quasi-nomadic character of agriculture has persisted longer than in the United States. There are signs, however, that this phase is coming to an end, as the virgin lands suited by soil and climate to coffee are being exhausted, and as the new generations of farmers and responsible officials are forced to turn their attention to more scientific utilization of the land.

Characteristic of many of the new generation is a more realistic appraisal of the resources and liabilities of their inheritance. Near the top of the list is an understanding that one of the basic reasons for the low standard of living and health in Brazil is the poor soil, particularly its deficiency in minerals. Although there are large areas suited to special

crops, such as coffee and cacao, the yield of most crops is low and many of the foodstuffs produced lack certain vitamins and minerals necessary for health.

Deficiencies of the Tropics

The popular belief that the tropics are fertile is not true. Although the rainy tropics favor certain types of trees, shallow-rooted crops do not thrive. Once the cover is removed, the good qualities of the soil are quickly leached out after the first year or two of cultivation. This is one of the reasons for the quasi-nomadic character of the backwoodsman with his "fire agriculture" that has been exaggerated and misinterpreted by many writers. In some areas the soil deficiencies may be overcome by better agricultural methods and the application of scientific knowledge.

In a large part of Brazil the climate is a handicap to the development of a European type of civilization. It is not a question merely of comfort, since much of the Amazon basin is more agreeable for a short stay than many sections of the United States during the summer months. The monotony of the heat plus the rainfall, the humidity, the lack of physical and mental stimulus that change gives. and the subtle effects of the climate on the basal metabolism, create difficulties for the average white man and even more for the average white woman.

The exuberant animal and plant life outside the frost zone has its advantages and disadvantages. Among the assets are the many plant species Brazil has given to the world. On the other side of the ledger is the constant struggle against noxious weeds and scrubs, ants and parasites. The tropical climate also presents special problems in connection with transportation, health and other matters. This is not to say that even the worst of tropical areas cannot be turned to advantage, but it does mean that the problem cannot be solved merely by romantic enthusiasm or by paper plans.

Brazil ranks high among the nations of the world in water-power resources, but a large part of its power potential is inconveniently located in relation to population, transportation facilities and raw materials. Furthermore, such coal deposits as have been located are of poor quality and are costly to exploit. Geological structures indicate the possibility of large reserves of petroleum. Here lies one of the hopes of the future. Brazil has other valuable mineral resources, but the mere physical existence of a mineral deposit has little meaning except in relation to the market, the costs of converting it into goods and services, and the legal and political framework.

Perhaps Brazil's chief handicap is what Preston James calls the "poor geographic arrangement" of Brazil's "superlative qualities." [1]

References to Brazil as a "new land" and a "new frontier" are apt to be misleading. It is true that there are frontiers of settlement, especially in western São Paulo, northwestern Paraná and southern Goiás, that look very much like areas in our own Southwest a half century ago. Farther west are large areas that have never been thoroughly explored. Brazil is still predominantly rural and is a country of large families. There are undoubtedly vast mineral and forest resources still to be developed. Yet most parts of Brazil have been explored and exploited for longer periods than the United States. Much of the best timber was cut out or destroyed by fire long ago, although some valuable forests remain. Erosion and exhaustion have taken their toll out of much of the soil. Socially, too, Brazil is a mature country, and future developments must conform to its customs and ideology. It is dangerous for the foreigner to go to Brazil with the idea that it is a new land where the traditions and practices—commercial, social, political—can be brushed aside or ignored.

1. Preston E. James, *Latin America,* Odyssey Press, New York, 1942, p. 388.

Brazil Is New but Also Old

There is a sense in which Brazil is "new," even in areas settled four centuries ago. In the carefully tended lands of central and western Europe one finds well-built, well-drained highways with stone walls, shaded by trees and ornamented by flowers and shrubs. The well-regulated rivers are crossed by stone bridges, some of which were built solidly centuries ago. The swamps have been drained and the fields cleared of stumps and stones. In the cities and towns are churches and public and private buildings that are among the ornaments of Western civilization. These achievements represent important capital accumulations. Against this background, Brazil appears raw and new just as much of the United States does.

Among the modern skyscrapers of the Brazilian coastal cities a few streets and buildings remain to evoke several centuries of history. Churches and convents of the eighteenth century, and some remnants of the late seventeenth century, have been preserved in port towns like Olinda, Salvador, Belém, São Luís (Maranhão) and Vitória, as well as in mining towns like Mariana, Sabará and Ouro Prêto. But in the older rural districts the passage of man is more often marked by destruction than by construction. The cutting or burning of the forests and the exhaustion of the soil and of mineral deposits brought decline or eventual abandonment in their wake. The nature of the climate and the building materials hastened the decay. In the rainy tropics the jungle grows quickly over highway or railway, and the floodwaters sweep away the bridges and other puny works of man. In northeastern Brazil, which was the first region to be settled, stone was scarce and timber was plentiful. Hence, as in New England, most structures were built of wood and did not survive fire, flood and borer insects.

In the search for a solution of the problems of this old yet new land, many Brazilian leaders today emphasize the importance of an objective, realistic approach, avoiding the

vainglorying that depicts Brazil as the richest country in the world (and the Amazon Valley as the potential granary of the universe!), as well as the defeatism that results from attempts to force Brazilian evolution into alien molds. Practical solutions must be found within the framework of the country's physical and social environment and in the spirit of its institutions.[2]

The Substance of the Brazilian Economy

More than two thirds of the Brazilian people live in rural regions and depend on products of the soil for their livelihood. Yet the cultivated land is only about 37 million acres, and comprises but 1.8 per cent of the total land area. Brazil is largely self-sustaining in food products with the exception of wheat, though the average diet is insufficient by nutritional standards.

Agricultural Production

The total value of agricultural output in 1946 was $1,219 million. Coffee is far in the lead, contributing more than one fifth of this total, and it is also the principal export. Nearly twice as much acreage is devoted to corn as to coffee, however, and the value of the corn crop stands second on the list. This is consumed almost entirely within the country. Rice is also widely grown, chiefly for home consumption. Another important food crop consumed domestically is manioc; beans and potatoes are also raised for the home market. The cultivation of sugar cane has recently expanded, after years of neglect; this is the fourth food crop in the order of value.

Among the industrial or commercial crops cotton takes first place; it expanded rapidly beginning in the 1930's, has been an important export and supplies much of the domestic

2. See, for example, address before the Faculty of Philosophy of Niterói, by Colonel Edmundo de Macedo Soares e Silva, Governor of the state of Rio de Janeiro, published in *Jornal do Commercio,* Rio de Janeiro, December 14, 1947.

textile industry. Tobacco is grown mainly for domestic consumers. Cacao, bananas, citrus fruits and many other varieties of fruits and nuts are produced both for export and for the internal market.

Brazil has the largest cattle population of any South American country; grazing is the oldest industry. The value of meat usually exceeds that of any single crop. Yet in cattle products, by value, Brazil is a poor second to Argentina. At present there is a shortage of these products for the domestic market, though some are exported.

A great many of the products of the soil are not ordinarily cultivated, but are obtained mainly from trees or plants in the wild state. Among these are woods of many sorts, technical crops, rubber, nuts and fruits, and some vegetable oils.

Rural products not only sustain most of Brazil's population and directly provide a living for more than two thirds of it, but also supply the chief items of export, by means of which Brazil is enabled to purchase much of what she requires from abroad. Yet agricultural output is insufficient for domestic needs, and on that account exports of crops of which there is a domestic shortage have been restricted. Improvement of agriculture, for the benefit both of producers and of consumers, is one of the nation's principal concerns.

Industry's Rapid Growth

Although it engages a much smaller proportion of the population, Brazilian manufacture produces as much, measured by value, as argiculture and animal husbandry. Close to 50,000 establishments turned out in 1939 goods valued at approximately $859 million. They employed about a million workers.

As is normal in the progress of the Industrial Revolution, textile manufacturing is the oldest and largest industry. Brazil is now self-sufficient in all but a few of the better grades of fabrics, and is a large exporter of cotton textiles, principally to neighboring South American countries. Many

of the mills are old, and require new equipment. Other large industries provide consumers' goods such as shoes, printed products, soap, furniture, matches and processed foods. There are sugar and flour mills, meat-packing establishments, biscuit and spaghetti plants, breweries.

Newer light industries have shown rapid growth recently, such as chemicals, rayon, plastics, pharmaceuticals and cosmetics. Heavy industries such as cement, iron and steel, and the manufacture of railroad cars have begun to be important. Electrical utilities have also expanded.

The growth of manufactures has been deliberately encouraged by tariff protection, financial assistance and export restrictions on raw materials. During and since the war, manufacturing has been aided by the difficulty of obtaining needed manufactured goods from abroad. The profits of successful concerns have been very large by the standards prevailing in the United States, and many have been profitable at a level of efficiency which would not permit survival under conditions with which our manufacturers are familiar. While wages are low relative to prices, they are high compared with the income of the rural population, and there is little difficulty in attracting labor. Many obstacles are encountered, however, in obtaining competent and skilled employees, in poor quality of raw materials, in inadequate transportation and the like.

Minerals and Power

Brazil has long been famous for gold and diamonds, but in total mineral production, estimated at over $50 million, these precious materials now rank behind coal and quartz crystals. Manganese ore and mica are also prominent in mineral production and exports. Brazil contains an abundance of many other mine and quarry products, some of which are relatively rare and some of which find an export market. At present the known supply of some essentials is insufficient. Among these are copper, lead, zinc, sulphur and potash.

Brazilian coal is of inferior quality and does not occur in deposits large enough and of the kind to permit economical mining. The fact that coal is mined in quantity is merely an indication of the great need for fuel. Wood and charcoal are widely used for this purpose, even by railroads and industrial plants. There are great hopes for petroleum, and there is a large undeveloped water-power potential. Some hydroelectric and thermal power plants exist, but per capita consumption of electricity is low.

One of Brazil's greatest undeveloped resources is iron ore. The country is believed to contain the largest reserves of high-grade ore in the world. Obstacles to its development have been the high cost of transportation to existing steel mills in other countries, and the scarcity of coal in Brazil. Some, however, is exported, and modern steel mills have recently been built. Further development of the large reserves of manganese is also receiving attention.

Transportation Inadequate

The difficulty of building up so large a country with such widely scattered occupations and resources has been increased by lack of adequate transportation. Air transport is highly developed, but it cannot perform the services required of railroads and roads. Railroads handle more than four fifths of the freight and a still larger part of the passenger traffic. A good share of the rest is carried by coastwise and river shipping, while motor vehicle transport is heavy only near the cities.

The railroads are survivals of an earlier technical era; they need modernization both in right of way and equipment. Their financial condition is, for the most part, poor and their management leaves much to be desired.

Brazil has only about a thousand miles of paved highways. There is demand for a rapid expansion of the road system, but construction is hampered by a shortage of funds and equipment, and the costs of labor and cement are high.

Secular Inflationary Trend

Among the basic reasons for the lack of sound and consecutive economic progress in Brazil are chronic inflation and recurrent devaluation of the monetary unit. Consequently, capital formation has been discouraged, and interest rates and profits are among the highest in the world. Investment funds flow preferentially into urban real estate or commodity speculation. With a steadily (and, at times, rapidly) rising price level, fixed-income-bearing securities are unattractive. Hence government financing is hampered, and resort is made to forced loans. Recurring budgetary deficits also feed the inflationary forces. A better augury for the future, however, is to be found in the resolute manner with which the Dutra government has attacked this problem: speculative credit has been curbed, and in 1947 the federal budget was balanced for the third time in forty years.

The Challenge to Improve

No matter where one looks in the Brazilian economy—whether at agriculture, industry, mining or transportation—there is both need and opportunity for improvement. The leading social problems of Brazil, of which Brazilians are well aware, depend fundamentally on higher productivity and better distribution of food, industrial products, and transportation, as well as on more conservation and less waste of natural resources. Each sector of the economy is hampered in its advance by deficiencies of the others.

Not only is the per capita income of Brazilians relatively low (from $125 to $165 annually) but there is a high degree of concentration of wealth, both regionally and by income classes. Historically Brazil has been a nation of large landed proprietors, yet land is becoming better distributed and there is a growing middle class. Health hazards are many, sanitation is inadequate, the average span of life is short. Life expectancy at birth is 39 years, as against 64 in the United

States. Housing is a problem. Education is elementary except for the few, and there is widespread illiteracy. Approximately 60 per cent of the children between seven and eleven years of age have no access to schools.

Recognizing such deficiencies, the proposed SALTE plan for development concentrates on health (*saúde*), foodstuffs (*alimentação*), transport (*transporte*), power (*energia*). Many of the projects will necessarily be governmental, but even these will provide a market for privately manufactured products, both domestic and imported, and may require some foreign capital. Any progress made will necessarily involve expansion within the private sectors of the economy.

Foreign Trade and Investment

Brazil has normally been a debtor nation during the present century, and has as a rule had an export surplus on that account. Only in a few years when one of three circumstances intervened has Brazil had an import surplus. One of these has been default of payment on foreign obligations, the second large new loans from abroad. The third occurred in 1947, when as a result of heavy exports during the war years, and inability to buy as much as usual from the main belligerents, Brazil had accumulated a large balance of foreign exchange which was spent for needed supplies as soon as these became available after the close of hostilities.

Brazil's exports have served not only to pay debt charges but to buy many essential commodities from other countries, and would continue to be required for this purpose even if the nation ceased to have a debtor status. The exports have always consisted chiefly of foodstuffs and raw materials, though in recent years exports of manufactures have been growing. With its exports, Brazil acquired the foreign exchange with which to purchase imports consisting mainly of manufactured products. In earlier years these were largely consumers' goods such as textiles, ironware, foodstuffs and, later, transportation equipment and motor vehicles. Recently

machinery and industrial materials have occupied a larger share of imports, as industrialization has made headway. This tendency will probably continue.

The United States has long been Brazil's chief customer and has in recent years become her principal supplier. Brazil may import more from Europe than she has been able to do during and since the war, and should find there a market for expanding exports.

While the nation will have more need for its own food crops and some of its raw materials than in the past, it can continue to export coffee and many special products, and should be able to ship out more minerals and woods. The emphasis has recently been more upon restricting imports than upon expanding exports.

It is estimated that at present Brazil needs a commodity export surplus of something under $100 million to service and amortize foreign debt, and to take care of other invisible items. This is much larger than her average export surplus before the war, but is less than one tenth the total value of Brazilian exports during 1947, which were, in terms of current dollars, three to four times as large as the prewar exports. In the absence of a calamitous deflation, Brazil should therefore be able to continue to buy a large amount of equipment and services abroad, and should in addition be able to pay the charges on a moderate amount of new foreign investment, especially if that investment resulted in substantially increased production and augmented exports.

Chapter 3

INCOME AND EMPLOYMENT

A MAJORITY of the Brazilian population is under twenty years of age; a large percentage of teen-agers are economically employed, and an overwhelming proportion of all workers are engaged in agricultural activities.

The youthfulness of the population is shown by the fact that in 1940 no less than 52.2 per cent were nineteen years of age or under, as compared with a ratio of only 34 per cent in the United States in that year. The census records show that of the 9.8 million Brazilians aged ten to nineteen, inclusive, over 37 per cent were engaged in economic activities of a nondomestic character; in addition, a considerable but uncertain number were employed as domestic servants. The occupational distribution of the population ten years or more of age is given in Table 1.

A Predominantly Rural Economy

More than two thirds of those engaged in nondomestic activities are found in the agriculture-animal husbandry classification. This occupational grouping checks fairly closely with the census returns showing the rural-urban classification, namely, 68.8 per cent rural and 31.2 per cent urban and suburban.[1] In Brazil, as elsewhere, there is a trend away from the farms to the cities, but the movement has been relatively less important than in various other South American countries. For example, the Argentine population today is about 57 per cent urban and only 43

1. In Brazil, the classifications "urban," "suburban" and "rural" are not based on any fixed number of inhabitants or population density, but on political categories. If the "suburban" population were included with the rural group, the ratios would be 77.7 per cent rural and 22.3 per cent urban.

TABLE 1

OCCUPATIONAL DISTRIBUTION OF POPULATION TEN YEARS OR MORE OF AGE ECONOMICALLY ENGAGED IN NONDOMESTIC ACTIVITIES, BY SEX AND INDUSTRIAL GROUPS, 1940

Occupation	Number Engaged			Per Cent of Total Engaged in Nondomestic Activities		
	Total	Male	Female	Total	Male	Female
	(*In Thousands*)					
Total	14,014	11,775	2,239	100.00	84.02	15.98
Agriculture, forestry, animal husbandry	9,454	8,183	1,271	67.46	58.39	9.07
Extractive industries	390	345	45	2.78	2.46	0.32
Manufacturing	1,398	1,106	292	9.98	7.89	2.09
Commerce	748	697	51	5.33	4.97	0.36
Stock brokerage	52	48	4	0.37	0.34	0.03
Transportation and communication	473	459	14	3.38	3.28	0.10
Public administration and teaching (official schools)	310	227	83	2.21	1.62	0.59
National defense	171	170	1	1.23	1.22	0.01
Liberal professions, private schools, religion	119	79	40	0.85	0.56	0.29
Social services	899	461	438	6.41	3.29	3.12

Source: Based on Giorgio Mortara, "A distribuição da população do Brasil segundo ramos de atividade," *Revista Brasileira de Economia,* Rio de Janeiro, Ano 1, No. 1 (September 1947), pp. 75-103.

Note: In this table the occupational classification is determined by the field of economic activity in which the person is engaged rather than by the activity individually exercised. For example, a doctor employed by a manufacturing concern would be included in the "manufacturing" category and not under "liberal professions."

per cent rural, as compared with 67 per cent rural and 33 per cent urban in 1869. In the United States the distribution is almost exactly the same as in Argentina. Since 1940, when the Brazilian census was taken, the rural exodus has been particularly heavy. Data based on the present distribution would doubtless show a further shift to the urban group, but it is probable that Brazil is still two-thirds rural.

A large proportion of the persons engaged in agricultural pursuits are adolescents; 27 per cent of the males and 56 per cent of the females are in their teens. Furthermore, 6 per cent of the men and 4 per cent of the women are 60

years of age or over. Hence, of the 9.5 million Brazilians engaged in agriculture and animal husbandry, only 6 million are in the most productive age groups—and a substantial proportion of these are incapacitated by disease.

The second largest occupational group falls in the manufacturing field (10 per cent) and the third in so-called social services (6.4 per cent), which include such variegated activities as amusements, hospitals and sanitary services, cultural organizations, food, furnishing and repair establishments. Trade (5.3 per cent), transportation (3.4 per cent), extractive industries (2.8 per cent) and public administration, including teachers in public schools (2.2 per cent), account for most of the remainder engaged in nondomestic activities. National defense in 1940 included only 1.2 per cent, and the liberal professions less than one per cent. The figures for the professional group are misleading, since many professional men and women who do not practice independently are included in other classifications.

Low Per Capita Income

The per capita national income in Brazil may be estimated at from $125 to $165, based on a total national income ranging from $6 to $8 billion. Admittedly, this is a rough calculation, since adequate data on which to base a more authoritative estimate are not available. Brazilian economists usually lean toward a lower figure, but it is doubtful if they make sufficient allowance for some items included in the United States national income studies. A group of economists associated with the Getúlio Vargas Foundation (Fundação Getúlio Vargas) has begun work on the most ambitious study of Brazilian national income yet undertaken.

For the sake of comparison, it may be noted that the per capita income in the United States approximates $1,450, or more than ten times the Brazilian average.[2]

2. The reader must be warned of the limitations of the national income concept as a basis for comparisons of individual well-being, either as between nations or as between different regions in the same country. The

Various attempts have been made to arrive at the national income through calculations of the value of goods and services produced by different branches of economic activity. The results of one such study, made by Dr. Walter Simonson of São Paulo, are given here (see Table 2) as of interest in indicating the general magnitude of the income attributable to the various economic fields, although it is clear that some of the estimates, as well as the propriety and coverage of some of the categories, need further checking and refining. For example, the income attributed to wholesale and retail trade is placed at $3 billion, or nearly 39 per cent of the total, while the income from agriculture, forestry, livestock and manufacturing totals only $2.8 billion.

Regional Distribution of Income

Despite the low per capita income for the country as a whole, some regions show a relatively high income. At the head of the list is the Federal District, with an estimated per capita income of $715 (U. S. currency). Since it includes the national capital—the largest city in the country—and is the seat of many wealthy families as well as the headquarters of many corporations, it occupies a distinctive position. Even here a large proportion of the inhabitants live on short rations amid squalid conditions, particularly the occupants of the *favelas,* or shacks, covering the steep flanks of the hills that are both the glory and the shame of Rio de Janeiro. These flimsy dwellings are without water or sewerage, and are a constant menace to the health of the community.

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per capita income is a good indicator of the over-all productive capacity and purchasing power in world markets, but to a much less degree of material or psychical satisfactions. For example, a householder in New York needs a basement and a central heating system in order to be comfortable, but it does not follow that a householder in Arizona without central heating has a lower standard of living. Likewise, the large number of motor vehicles in the United States proves a lot regarding the productive capacity of the United States but very little regarding the welfare of the inhabitants. An increase in the number of motor cars beyond the optimum rapidly diminished the usefulness of all cars and furthermore seriously reduced the amenities of urban life for all persons, whether owners of motor cars or not.

TABLE 2

NATIONAL INCOME, BY PRODUCTIVE CLASSES, 1946

(In Millions)

Class	Income	
	Cruzeiros	U. S. Dollars
Total	156,210	7,810.5
1. Agriculture and livestock	28,316	1,415.8
2. Minerals	1,164	58.2
3. Manufacturing	27,751	1,387.5
4. Government	14,424	721.2
5. Trade and distribution	60,630	3,031.5
6. Rent	3,300	165.0
7. Light and power	650	32.5
8. Private cable companies	20	1.0
9. Telephones	225	11.2
10. Broadcasting	50	2.5
11. Water supply	50	2.5
12. Gas supply	75	3.8
13. Transportation	3,160	158.0
14. Trucking and taxis	4,420	221.0
15. Port services	260	13.0
16. Coastal trade transport	316	15.8
17. Insurance and banks	2,700	135.0
18. Brokers	150	7.5
19. Gambling	100	5.0
20. Real estate transactions	2,200	110.0
21. Medical care	2,000	100.0
22. Engineers, legal services and dentists	1,500	75.0
23. Education	250	12.5
24. Lodging and restaurants	850	42.5
25. Domestic servants	850	42.5
26. Newspapers and magazines	300	15.0
27. Repair shops	500	25.0

Source: Based on data supplied by Dr. Walter Simonson of São Paulo, October 1947. Figures represent added values.

Comments:

Line 1. Probably does not make adequate allowance for farmers' consumption of their own produce.
Line 3. Includes construction.
Line 4. Includes some government services, such as utilities.
Line 5. The income attributed to trade and distribution represents approximately 39 per cent of the total, and more than the income from agriculture and manufacturing combined. It is clear that this proportion is excessive. In the United States, the income from wholesale and retail trade is about half of agriculture plus manufacturing. At the same time it should be noted (1) that item 5 includes business rents and (2) that distribution costs in Brazil are extremely high.
Line 6. Business rents are included in line 5. Apparently no rent is imputed to rural residences.
Line 13. Includes railways, aviation, buses and streetcars.

The national capital and the near-by areas of Rio de Janeiro State have long been the mecca for both the highest and the lowest strata of society. During the imperial era, the landed proprietors were induced to take up residence at the Court. In the last years of the Empire freed slaves and many persons of mixed blood flocked to the capital in search of better opportunities or freedom from the onerous labors of the plantations. Rio de Janeiro also received, and continues to receive, some of the refugees from the drought areas of the north and the northeast. As the political center of the country, Rio de Janeiro also attracts politicians, administrators, office workers and job-seekers of all sorts. Despite the construction boom of recent years, neither housing nor utilities has kept pace with the growth of population.

Of the states, São Paulo leads the list, with a per capita income of $430, followed by Rio Grande do Sul, with $175. The state of São Paulo, with only 17 per cent of the population of Brazil, accounts for over 41 per cent of the commercial transactions of the country (see Table 3), 36 per cent of the agricultural production and 50 per cent or more of the manufacturing output. Its banks hold 34 per cent of all bank deposits. It has 36 per cent of all passenger car registrations. The importance of São Paulo as a coffee producer (accounting for half of the national total) is well known, but it is not generally recognized that the state also takes first position in several other leading crops, such as cotton, rice, potatoes, tomatoes, peanuts, garlic, pineapples, bananas, oranges, castor beans and tea. Furthermore, it is in second position in corn, sugar cane and grapes. It produces substantial quantities of various other items, such as tobacco and manioc, and has a large livestock population.

Broadening Distribution of Income

A relatively high degree of concentration of wealth prevails in Brazil. This concentration is perhaps most marked in urban property and control of commercial and industrial enterprises. Brazil has traditionally been a country of large

TABLE 3

VALUE OF MERCANTILE TRANSACTIONS, BY STATES AND CAPITALS, 1945

(In Thousands of Dollars)[a]

State or Territory	Value of Sales	Capital (Municipality)	Value of Sales
Total	8,011,750	Total	4,476,150
Acre Territory	2,200	Rio Branco	2,150
Amazonas	23,850	Manaus	6,650
Pará	79,150	Belém	52,650
Maranhão	36,000	São Luís	19,700
Piauí	28,900	Teresina	5,700
Ceará	97,650	Fortaleza	55,250
Rio Grande do Norte	37,150	Natal	18,350
Paraíba	87,350	João Pessoa	20,650
Pernambuco	308,000	Recife	222,450
Alagoas	64,850	Maceió	37,250
Sergipe	31,400	Aracaju	16,400
Bahia	241,600	Salvador	120,350
Minas Gerais	540,800	Belo Horizonte	109,500
Espírito Santo	71,450	Vitória	32,350
Rio de Janeiro	345,900	Niterói	56,450
Federal District	1,426,250	Rio de Janeiro	1,426,250
São Paulo	3,322,300	São Paulo	1,940,200
Paraná	248,000	Curitiba	70,150
Santa Catarina	158,950	Florianópolis	12,200
Rio Grande do Sul	736,800	Pôrto Alegre	243,150
Mato Grosso	46,400	Cuiabá	5,150
Goiás	76,800	Goiânia	3,200

Source: Annário Estatístico do Brasil, Instituto Brasileiro de Geografia e Estatística, Conselho Nacional de Estatística, Rio de Janeiro, Ano VII (1946), pp. 338-39. Amount of transaction calculated from transaction taxes, which are levied on practically every type of mercantile operation except sales by very small farmers.

a. Converted at the rate of $.05 per cruzeiro.

landed estates. There are still many vast holdings, particularly in the Amazon basin and in the state of Mato Grosso. Properties of twenty-five hundred acres and upward account for nearly half of the total area in rural establishments. But the relative position of the *fazendeiro* (large landowner) has declined during recent decades. Land has become more widely distributed as the result of numerous forces: subdivision through inheritance, growth of cities, difficulty of obtaining laborers, forced sales in bad times,

TABLE 4

AGRICULTURAL ESTABLISHMENTS, BY SIZE, WITH PERCENTAGE OF TOTAL, 1940

Size in Hectares	Number of Properties	Per Cent of Total Number	Area	Per Cent of Total Area
			(*In Hectares*)	
Total	1,904,589	100.00	197,720,247	100.00
Less than 1	39,306	2.06	22,926	0.01
1 to 5	375,163	19.70	1,069,825	0.54
5 to 10	240,089	12.61	1,800,688	0.91
10 to 20	315,676	16.57	4,557,586	2.31
20 to 50	455,057	23.89	14,298,481	7.23
50 to 200	327,713	17.21	31,434,822	15.90
200 to 1,000	120,810	6.34	49,006,270	24.79
1,000 to 5,000	24,322	1.28	46,956,365	23.75
5,000 to 100,000	3,453	0.18	41,369,049	20.92
100,000 and over	37	0.00	7,204,235	3.64

Source: Anuário Estatístico do Brasil, Instituto Brasileiro de Geografia e Estatística, Rio de Janeiro, Ano VII (1946), pp. 84-86.

shift of capital to industry and declining prestige of rural society. Between 1920 and 1940 the number of rural establishments increased from 648,000 to 1,905,000, and the area in properties of two hundred hectares or less rose from 15 per cent to nearly 27 per cent. Furthermore, there appears to have been a significant increase in the number of farm tenants paying cash rents as well as of share tenants furnishing their own equipment and part of the operating capital. (See Table 4.)

According to a recent study by the research department of the Mogiana Railway, there were 248,445 farm properties in the state of São Paulo, not including the numerous truck gardens and small properties in the suburban areas of the state capital. Of these, 214,340, embracing 25 per cent of the cultivated areas, were small properties up to 247 acres in size; 31,637, covering 41 per cent of the area, were medium-sized (between 247 and 2,471 acres) and 2,468 (34 per cent) were large properties exceeding 2,471 acres in extent.

Although a few *fazendas* contain more than a million coffee trees each, nearly 85 per cent of the coffee farms in the state of São Paulo are family-size farms.

Types of Rural Producers

Of the 9.5 million Brazilians engaged in activities of an agricultural and pastoral character, the 1940 census reveals 253,000 employers, 3,164,000 employees, 3,310,000 working for their own account, 2,666,000 as members of farm families and 62,000 unclassified. (See Table 5.) Neither the census returns nor the available fiscal data, however, provide very useful clues to the economic status of the millions composing these rural classes. Calculated on the basis of the estimated value of agricultural-pastoral production, the per capita return of the group would be about Cr. 3,000 ($150).[3] Undoubtedly there are hundreds of thousands of Brazilians —perhaps several million—to whom Cr. 3,000 in cash would seem like a fortune. Among these are the squatters and the quasi-migratory families who occupy small plots, chiefly on the margins of cultivation and settlement, but also in considerable numbers near populated centers. They have no vehicles and few domestic animals; their farm tools are usually limited to a hoe or an axe. They produce part, and in some sections most, of their food, weave their hammocks and erect their primitive shelters of palm leaves or of mud and saplings. A slightly higher status is achieved by those who settle more or less permanently, either on a large estate, where they become a part of the regular labor force, or near a town or city where they can sell their produce or their labor. The huts of the more permanent workers acquire tile roofs and perhaps other amenities.

A large part of Brazilian production is derived from gathering the natural products of the forests, plains and streams: rubber, Brazil nut, babassú kernels, carnauba palm

3. The abbreviation "Cr." is used herein to designate the cruzeiro, the Brazilian currency unit. Unless otherwise stated, conversions are made at the rate of Cr. 20 to $1.00, or $.05 per cruzeiro.

TABLE 5

EMPLOYMENT STATUS OF PERSONS ECONOMICALLY ENGAGED IN NONDOMESTIC ACTIVITIES, 1940

Class	Total	Em-ployer	Em-ployee	Working for Own Account	Member of Family	Un-known
			(*In Thousands*)			
Total	13,538	365	5,512	4,752	2,780	129
Agriculture, grazing	9,455	253	3,164	3,310	2,666	62
Extractive industry	391	4	114	225	45	3
Manufacturing	1,400	30	1,078	250	31	11
Commerce	749	54	368	306	18	3
Banks, insurance, exchanges	51	1	41	9	[a]	[a]
Transportation and communication	474	3	390	75	4	2
Social services	899	18	308	524	16	33
Other [b]	119	2	49	53	[a]	15
			(*Percentage Distribution*)			
Total	100.0	2.7	40.7	35.1	20.5	1.0
Agriculture, grazing	100.0	2.7	33.5	35.0	28.2	0.7
Extractive industry	100.0	1.1	29.1	57.5	11.5	0.9
Manufacturing	100.0	2.2	77.0	17.9	2.2	0.8
Commerce	100.0	7.2	49.1	40.9	2.4	0.4
Banks, insurance, exchanges	100.0	1.9	79.8	17.9	0.2	0.3
Transportation and communication	100.0	0.7	82.3	15.8	0.9	0.4
Social services	100.0	2.0	34.2	58.3	1.8	3.7
Other [b]	100.0	1.3	41.1	44.7	0.5	12.4

Source: Gabinete Técnico do Serviço Nacional de Recenseamento, based on summary in "Mercado de Trabalho," *O Observador*, Rio de Janeiro, Ano XII, No. 144 (January 1948), pp. 35-49.

a. Less than 1,000.

b. The following classes are omitted from this tabulation: public administration, public education and national defense. Hence the grand total shown in this table (13,538,000) is somewhat less than that shown in Table 1.

leaves, and the like. Hunting, fishing and collecting rare plants, animals and skins engage a considerable number of persons. There are over a hundred thousand *garimpeiros*, or free-lance prospectors and diggers for diamonds, semi-precious stones and minerals. From the low-income groups on the fringes are derived the seasonal workers for crops like

coffee, cotton and cacao, and for gathering mate leaves or herding cattle.

A step higher in the economic scale are the sharecroppers, share farmers and renters, of whom there are many types. One type is the cowman, or *vaqueiro*, of the sertão, who may be an administrator as well as a worker. Another is the sharecropper who grows tobacco and sugar cane. A large part of the cotton grown in southern Brazil is produced by cash or share tenants. In São Paulo and adjoining areas the tenant, or *colono,* operates on the basis of a contract whereby the tenant, with the aid of his family, agrees to clean the land and plant a specified crop, usually coffee, or, in the case of an established farm, to take care of a certain number of coffee trees or a given acreage of such crops as sugar cane, rice, beans or oranges. In addition to the fixed sums paid to the tenant under this contract, he and members of his family derive other earnings by planting foodstuffs or pasturing stock on special plots assigned to them and by seasonal work such as harvesting. The contract may also provide for planting corn, rice or other crops, on a share basis, between the coffee rows. A considerable number of coffee tenants succeed in saving enough to buy a small farm or to set up in business.

Part of the farm labor force consists of hired laborers. The independence of this group has increased in recent years as the result of the labor shortage, although it is doubtful whether their real income has risen. At present most of these workers insist on being paid in cash. Some periodically draw their savings and go for a "bust" that reminds one of life in the United States during the frontier era of cattle trailing or gold mining. A chauffeur in the Alta Paulista section of the state of São Paulo, where large areas of new lands have recently been put into coffee, told the author of a farm laborer who hired a car and a chauffeur for a week.

A relatively small group is made up of administrators or

farm managers, who receive from Cr. 500 to Cr. 3,000 ($25 to $150) a month, plus housing and other privileges.

Of the farm owners and operators there are also many types. Generally speaking, the wealthy owners of large properties live in the state or national capital, although they may spend some time at the *casa grande* on their estate. A substantial proportion of the large farms, ranches, timber lands, and colonization projects are owned by stock companies, including foreign corporations. Companies operating sugar centrals own extensive sugar cane lands. In some regions, large landed proprietors live on their farms and remain essentially rural in their customs and outlook.

Growing Middle Class

Brazilian society retains something of the aristocratic imprint it received during colonial and imperial days. Titles of nobility under the Empire were not hereditary, however, and Brazilians are quick to accord recognition to achievement. Along with the breaking up of many large estates and the eclipse of the rural aristocracy, there has arisen a numerically large and flourishing middle class, which has been strengthened by the growth of manufacturing, the spread of education, the enlargement of military and government services, the entry of women into business and the professions and the increasing importance of professional and technical skills. The growth of both large and smaller cities during recent decades, with their numerous apartment houses and extensive garden suburbs, bears witness to the increased importance of the middle-income groups.

Wages and salaries are still low, but the incomes and benefits enjoyed by industrial workers are materially above the level of rural laborers. The spread between the wages of skilled and unskilled workers is large. Skilled workers and foremen in the Rio–São Paulo industrial area receive from Cr. 1,800 to Cr. 3,000 ($90 to $150) a month. The rate for unskilled adult workers is from Cr. 400 to Cr. 500

($20 to $25). The over-all average for Brazil is probably about Cr. 700 ($35) a month, not including various benefits that may increase the wage bill by 25 per cent or more in some sections. In the typical family the wife and some of the children also work and thus supplement the family income.

Chapter 4

PRODUCTS OF THE LAND

CULTIVATED LAND in Brazil makes up a very small part of the total area of the country, and is largely concentrated in a few sections. There are great forests and many valuable tree crops, but the forests have been shrinking for many years and are now subject to rapid destruction (except in the less accessible parts of the Amazon Valley). The cattle industry is old and extensive and there are wide areas of grazing land, though little of this land is devoted to man-made pasture.

The Cultivated Area

The average annual cultivated area in all important crops was 32.1 million acres during the ten years 1933-1942. This increased in 1945 and 1946 to 37.3 million acres, or 1.8 per cent of the total land area of Brazil. The cropland harvested in the United States in 1945 was 352.9 million acres, or 18.5 per cent of the land area. The rural population of Brazil is now about 33 million, as compared with about 58 million in the United States, but the actual farm population in Brazil is approximately as large as in the United States.

Most of the cultivated land is located within a relatively small area of south central Brazil. Nearly 64 per cent is within the three states of São Paulo, Minas Gerais and Rio Grande do Sul; approximately 10 per cent more is in Paraná and Rio de Janeiro. With 5.8 per cent in Espírito Santo and Santa Catarina, an aggregate of approximately 80 per cent is located in the south central region. Bahia and Pernambuco together have 8.6 per cent, leaving 12 per cent for the rest of the country.

Arable Area Comparable to Southeastern United States

Experts have estimated the amount of new agricultural land available for settlement at 16 million acres, located principally in Goiás, northern Paraná and western São Paulo.[1] With the 37 million acres now cultivated, this gives a potential total of 53 million acres—an area roughly comparable with the harvested acreage of the nine southeastern states of the United States, where the climate and the soil deficiencies are similar to the chief farm areas of Brazil.

Doubtless there are other small areas that can eventually be brought under cultivation as population and transport facilities are expanded, notably western Paraná, the region south and west of Campo Grande (Mato Grosso) and lands north of Patos (Minas Gerais). By drainage some additional coastal lands could be utilized, and strips of alluvial soil in the São Francisco Valley are considered suitable for irrigation. Given a favorable relationship between commodity prices and fertilizers, some abandoned and neglected lands could be turned to advantage. Probably additional acreage suitable for tree crops could be found in northern and central Brazil.

On the other hand, allowance must be made for withdrawals through exhaustion or erosion. Likewise, the continued cultivation of some areas now being harvested, especially the remoter regions like Goiás, is dependent upon the maintenance of favorable prices.

Principal Crops

Brazil's crops may be conveniently considered from the standpoint of whether they are produced primarily for export or to satisfy domestic consumption. They may also be classified as perennial or annual. Several of the leading export crops are also perennials, such as coffee and cacao, but

1. This is the estimate of Guy L. Bush, Agricultural Attaché of the United States Embassy, Rio de Janeiro, to whom the writer is indebted for many helpful suggestions.

TABLE 6

Production of Principal Crops, 1935-1939 Average, 1946 and 1947

Crop	Unit	1935-1939 Average	1946	1947	Principal Producing States (1946)
Coffee, exportable	bags, 60 kilos	22,400,000	15,300,000	15,100,000	S. Paulo (48%), Minas (22%), Esp. Santo (10%), Paraná, Rio, Bahia
Cacao beans	bags, 60 kilos	2,200,000	2,150,000	2,420,000	Bahia (96%), some in Pará, Esp. Santo, Amazonas
Sugar cane	metric tons	17,400,000	28,300,000	28,400,000	Minas (19%), Pernam. (18%), S. Paulo (16%), Rio (11%), some in all
Corn	bags, 60 kilos	94,600,000	95,100,000	90,200,000	Minas, S. Paulo, R. G. do S., Paraná, some in all
Rice	bags, 60 kilos	22,800,000	46,200,000	45,200,000	S. Paulo (34%), R. G. do S. (23%), Minas (18%), some in all
Manioc	metric tons	5,500,000	11,600,000	10,900,000	Bahia, Minas, Sta. Catarina, Pernam., R. G. do S., some in all
Beans, dried	bags, 60 kilos	13,700,000	17,000,000	16,800,000	Minas, S. Paulo, Paraná, R. G. do S., some in all
Wheat	metric tons	135,485	248,058	288,173	R. G. do S. (76%), Sta. Catarina (15%), Paraná (7%)
Cotton, lint	metric tons	383,805	373,163	345,643	S. Paulo (65%), Paraná (2%), remainder in N. E.
Cottonseed	metric tons	895,743	735,018	680,812	
Tobacco, leaf	metric tons	92,684	118,557	101,771	Bahia (35%), R. G. do S. (33%), Minas, Sta. Catarina, Pará
Castor beans	metric tons	134,261	143,003	144,671	Ceará, S. Paulo, Pernam., Bahia, Minas, Alagoas, etc.
Tung	metric tons	[a]	4,539	6,090	S. Paulo, R. G. do S., Paraná
Potatoes	metric tons	384,465	431,567	384,442	S. Paulo, Paraná, R. G. do S., Minas
Sweet potatoes	metric tons	[a]	924,074	1,051,045	R. G. do Norte, R. G. do S., Sta. Catarina
Oranges	boxes	33,700,000	30,000,000	30,084,781	S. Paulo, Rio, Minas, R. G. do S., some in all
Bananas	bunches	[a]	117,000,000	123,691,466	S. Paulo, Minas, Rio, Pernam., some in all
Pineapples	pineapple	[a]	77,000,000	74,000,000	S. Paulo, Pernam., Paraíba, Minas, Rio, all but R. G. do S.
Alfalfa	metric tons	140,991	149,310	145,126	R. G. do S. (71%), S. Paulo (15%), Sta. Catarina, Paraná
Oats	metric tons	11,230	10,695	10,421	Chiefly R. G. do S.
Rye	metric tons	14,491	11,427	10,527	Paraná, Sta. Catarina, R. G. do S.
Barley	metric tons	12,316	11,396	12,211	R. G. do S., Sta. Catarina, Paraná

Source: Compiled from official releases of the Brazilian Ministry of Agriculture.

a. Not available.

TABLE 7

PRODUCTION OF PRINCIPAL CROPS, BY AREA AND VALUE, 1942 AND 1946

Crop	Cultivated Area		Value of Production	
	1942	1946	1942	1946
	(*In Thousands of Hectares*)		(*In Millions of Cruzeiros*)	
Total, all crops [a]	12,542	15,550	9,156	24,380
Perennial crops				
Coffee	2,174	2,396	1,334	5,350
Cacao	241	269	183	259
Bananas	80	90	150	536
Oranges	123	75	237	356
Grapes	35	33	83	176
Coconuts	51	38	50	137
Tea (India)	—	1	[b]	13
Tung	—	5	[b]	9
Seasonal crops				
Corn	4,059	4,323	1,478	4,015
Wheat	277	301	162	268
Rice	1,059	1,681	1,156	3,117
Oats	10	12	5	10
Rye	17	17	10	16
Barley	14	13	8	10
Alfalfa	21	27	32	83
Sugar cane	559	762	737	2,032
Cotton	1,931	2,507	1,433 [c]	2,599 [c]
Peanuts	[b]	34	[b]	45
Castor beans	127	176	96	134
Tobacco	96	145	204	557
Manioc	608	931	707	1,815
Potatoes	72	87	202	541
Sweet potatoes	[b]	114	[b]	305
Beans, dried	977	1,403	504	1,256
Beans, green	[b]	59	[b]	43
Onions	[b]	22	[b]	145
Garlic	[b]	7	[b]	80
Tomatoes	[b]	9	[b]	116
Pineapple	9	12	27	57

seasonal crops like rice and short-staple cotton have gained in relative importance. (See Tables 6 and 7.)

Coffee Still King

Among the export crops coffee occupies the premier position. Except for a few years, it has been the most valuable

TABLE 7—CONTINUED

Crop	Cultivated Area		Value of Production	
	1942	1946	1942	1946
	(*In Thousands of Acres*)		(*In Thousands of Dollars*)[d]	
Total, all crops [a]	30,991	38,424	457,800	1,219,000
Perennial crops				
Coffee	5,372	5,921	66,700	267,500
Cacao	596	665	9,150	12,950
Bananas	198	222	7,500	26,800
Oranges	304	185	11,850	17,800
Grapes	86	82	4,150	8,800
Coconuts	126	94	2,500	6,850
Tea (India)	—	2	[b]	650
Tung	—	12	[b]	450
Seasonal crops				
Corn	10,030	10,682	73,900	200,750
Wheat	684	744	8,100	13,400
Rice	2,617	4,154	57,800	155,850
Oats	25	30	250	500
Rye	42	42	500	800
Barley	35	32	400	500
Alfalfa	52	67	1,600	4,150
Sugar cane	1,381	1,883	36,850	101,600
Cotton	4,772	6,195	71,650 [c]	129,950 [c]
Peanuts	[b]	84	[b]	2,250
Castor beans	314	435	4,800	6,700
Tobacco	237	358	10,200	27,850
Manioc	1,502	2,301	35,350	90,750
Potatoes	178	215	10,100	27,050
Sweet potatoes	[b]	282	[b]	15,250
Beans, dried	2,414	3,467	25,200	62,800
Beans, green	[b]	146	[b]	2,150
Onions	[b]	54	[b]	7,250
Garlic	[b]	17	[b]	4,000
Tomatoes	[b]	22	[b]	5,800
Pineapple	22	30	1,350	2,850

Source: Ministério da Agricultura, Serviço de Estatística da Produção, Rio de Janeiro, 1947. Data for 1946 provisional.

a. Figures rounded to thousands. Value totals apparently include minor crops not listed here.

b. Not available.

c. Lint only; seed excluded.

d. Converted at the rate of $.05 per cruzeiro.

single export since about 1830. Also it has usually been the most valuable crop produced in Brazil. From about 1850 through 1935 coffee accounted for over half of the total value of exports, except in 1917 and 1918 and for a few years around 1870. During the decade 1924-1933, coffee exports comprised over 71 per cent of the total value of shipments abroad. During the 1940's the ratio has averaged about 32 per cent.

Coffee consumption in Brazil averages yearly about 5.4 million bags of 60 kilograms each, a per capita consumption of 6.5 kilograms (14.3 pounds), which is below the United States and prewar Scandinavia, but above most other countries. Domestic consumption is about one fourth of current harvests.

The number of bearing coffee trees in Brazil increased almost steadily for over a century up to the 1933-1934 season, when a maximum of approximately 3 billion trees was reached. The number of trees has since declined to about 2 billion. Experts expect a further decline to about one billion by 1961. This forecast is based on estimates of remaining available virgin soils suitable for coffee production, together with the ages of existing trees and their life expectancy derived from past performance for the different types of soils. New lands suitable for coffee are considered sufficient for 300 million to 600 million trees. The remaining areas are believed to be as follows:

1. Isolated spots in the extreme western part of São Paulo beyond Tupã, the present terminus of the Paulista Railway, and somewhat larger areas in the northwest corner of the state. These soils are lighter than in the older coffee zones.
2. Northern Paraná. Frequent freezes make planting unprofitable beyond a line fifteen miles south of Londrina. Paraná lands yield large crops, but the quality is comparatively poor.
3. The eastern part of Minas Gerais.

4. The central and northern part of Espírito Santo. Coffees produced in these regions are harsher in flavor and bring low prices; they are sold chiefly in the domestic market.
5. Goiás is believed to have good coffee lands but planting will be feasible only if the price of coffee is high enough to pay the additional transportation costs.[2]

The productive life of coffee trees varies greatly according to the soil and climatic conditions. Trees in the Ribeirão Prêto district of São Paulo are estimated to produce for sixty years, but this period falls to twenty or thirty years in the sandy loam soils. In the state of Espírito Santo the life expectancy is only eight years.

The foregoing estimates are based on current ratios of coffee prices to cost of production, and on existing relationships between returns from coffee and competitive crops. Given good prices, the bearing age of the trees might be extended by more careful cultivation and greater use of fertilizers. Heretofore, coffee has seldom been replanted on used coffee lands, but a few instances are known where new plantations have done well on used area after several years devoted to leguminous plants. The use of fertilizers has also increased—coffee husks, sodium nitrate, animal manure, mixed fertilizers and cottonseed or other oilseed meal.

Coffee's Statistical Position Improved

Brazil has long held first place in the production and export of coffee. During the years 1925-1929 Brazil supplied over 60 per cent of the coffee moving in international trade. Brazil has lost ground, however, as the result of increased planting in colonial possessions of European countries, preference for more "mild" coffees in the United States coffee blends and, above all, the increased taxes and trading difficulties growing out of Brazil's attempt at valorization in

2. The estimates of future production are based to a large extent on material prepared by Henry W. Spielman, former Agricultural Economist with the American Embassy in Rio de Janeiro.

times of overproduction. From 1925 to 1945 world coffee production was regularly in excess of exports plus local consumption. The main burden of the surpluses was borne by Brazil. Between 1931 and mid-1944 Brazil destroyed a total of 78,215,000 bags of coffee, principally by burning. In 1944 and 1945 Brazilian coffee exports exceeded production for the first time since the short crop of 1918.[3]

Production costs in Brazil and in most other coffee-producing countries have increased as the result of (1) lower yields as coffee has migrated to poorer soils, (2) higher transportation costs as plantations have moved farther inland and (3) increased cost of bags, tools and supplies. Labor costs calculated as a percentage of coffee prices probably have not increased.

Cotton Recedes After Big Advance

Cotton has in recent years been coffee's closest competitor for top ranking as Brazil's most valuable crop. During the six years 1939-1944 cotton (including value of seed) was in first place, but it lost ground steadily thereafter. In 1945 and 1946 cotton was in fourth place, after coffee, corn and rice.

The cotton plant is indigenous to Brazil. It is grown in practically every state, but the two principal producing centers are (1) the state of São Paulo, with the adjacent areas in northern Paraná and southern Minas Gerais, and (2) the northeast, principally the states of Paraíba, Rio Grande do Norte and Ceará. A considerable part of the production in the northeast is derived from the long-staple perennial variety, but except in a few sections, the strains have not been kept pure and have become badly mixed with the annual varieties, which are also cultivated.

Brazil has been an important exporter of cotton at various periods of its history, particularly during the late eighteenth

3. For information on attempts to regulate the coffee market, see George W. Stocking and Myron W. Watkins, *Cartels or Competition?*, Twentieth Century Fund, New York, 1948, pp. 71-72 and 161-62.

and early nineteenth centuries, at the close of our Civil War, in 1919, and again since 1934. The big increase which has occurred in recent times has come principally from the southern states, particularly São Paulo. Production in southern Brazil rose from 70,500 bales in 1930-1931 (15 per cent of total Brazilian production) to a peak of 2.2 million bales in 1944 (82 per cent of the total).

The foundations for expansion of cotton production in São Paulo were laid during the 1920's through the work of the state agricultural institute at Campinas in developing suitable seed and improving ginning and classification. Production increased rapidly during the early 1930's following the decline in coffee prices and the adoption of the crop restriction program in the United States.

The cotton output continued the general upward trend from 1930 through 1944, when a record crop of 586,098 metric tons (2.7 million bales) was attained. During these years, except 1942, the climatic conditions were good in São Paulo. Rains began in late August or early September, permitting early spring cultivation, and ceased early in April. Since 1944, however, weather conditions have been less favorable. Other circumstances that have brought about a reduction in the crop are the decline in the yield, losses from plant diseases, scarcity of labor and the prospect of greater returns from other crops.

Outlook for Cotton

During the cotton boom of the 1930's, cotton was planted between coffee rows, and in the old coffee zones it sometimes replaced coffee on fazendas going out of production on account of the age of the trees. In the new areas of western São Paulo coffee was planted on the ridges and cotton in the valleys. Now a large part of these lands is eroded or exhausted. Cotton rapidly depletes soil fertility. Since about two thirds of the cotton in São Paulo was grown on sandy soil with a rolling topography, the heavy rains carried away

the plant foods. Very little terracing has been attempted, and it has been difficult to find suitable strip crops to hold the soil and water.

With improved prices for coffee and foodstuffs, more labor and attention have been diverted to those crops. Some former cotton lands have been turned into pasture. Peanuts have grown in popularity as an alternative crop providing a source of vegetable oil in place of cottonseed.

Climatic conditions in northern Paraná have never been very favorable for cotton. Generally the rains are excessive, continuing into the harvest period. The rains increase the damage from the leaf worm and the pink boll worm.

Pessimism about the future of cotton, at least as a major export crop, is fairly general. Some Brazilians claim that the United States will insist on retaining its export markets by paying such subsidies as are necessary. But some observers feel that the reaction has gone too far. Large investments have been made in gins, presses, warehouses and other installations. The cotton textile industry provides a large internal market for raw cotton. With the adoption of better agricultural practices higher yields might be expected. New cotton areas may be opened up, such as in the São Francisco Valley, as hydroelectric power developments make further irrigation feasible.

Corn Most Widely Grown Crop

Corn is the most important grain produced in Brazil. Most of the crop is consumed in the country, as human or animal food and for industrial uses. It occupies more acreage than any other crop. It is produced under a variety of conditions, as a commercial crop by large and small farmers, as a subsistence crop by tenants and squatters, and by interplanting with coffee, beans, rice and other crops.

Minas Gerais, São Paulo, Rio Grande do Sul, Paraná and Santa Catarina accounted for 85 per cent of the corn production in 1946. These are likewise the chief hog-producing states.

Prepared in a variety of forms, corn is one of the basic items of the Brazilian diet. Corn flour is also mixed with wheat flour to reduce wheat imports. Cornstarch, corn oil and other products are manufactured by the subsidiary of a United States company. The northeastern states at times have a sizable surplus over the consumption possibilities of their immediate territory, but for some years exports have been permitted only under license after all domestic requirements have been supplied.

The average yield in 1935-1939 was 21.5 bushels an acre, which is below the yields in Canada, the United States, Argentina and possibly Chile, but above the output in other Western Hemisphere countries. During the last decade some work has been done to develop hybrid corn suitable to Brazilian conditions. This work is now being pushed by the Basic Economy Corporation controlled by Nelson Rockefeller. Although the improvement of seed is only one aspect of a complex problem, involving soil conservation, improved cultivation methods, better storage and distribution facilities and cheaper transportation, achievements on that front may be expected to have far-reaching effects in the campaign for cheaper and more food.

Rice Exports Expanding

Rice, like corn, is widely grown and is one of the staple articles of the Brazilian diet. In Brazilian homes and restaurants, rice (either separately or served with beans) is considered an essential dish, even though potatoes and manioc meal are also served. Apparent per capita consumption ranges from 44 to 60 pounds.

At the beginning of this century Brazil's annual imports of rice were around 100,000 tons. By 1910 the country was normally self-sufficient. Since the first world war there has regularly been an export surplus, which has increased in volume since 1930. Exports of milled rice averaged 42,000 short tons in 1936-1940 and reached 200,000 tons in 1946

and 1947. Some rice flour is used locally for mixing with wheat flour.

Both wet- and dry-land rice are produced. The major producing areas are the Paraíba Valley and the coastal regions of São Paulo State, the valley of the Jacuí River and the western margin of the Lagôa dos Patos and Lagôa Mirim in Rio Grande do Sul, and the western triangle of Minas Gerais with the near-by areas in the state of Goiás. The first two areas are irrigated and cultivated with the aid of machinery. Some rice is grown on alluvial lands or by irrigation in the north. There is also considerable production of upland rice in São Paulo, Minas Gerais and Rio Grande do Sul, partly by interplanting with other crops, as well as in other regions.

The principal varieties produced are the Japan, the Blue Rose and the Agulha, a long-grain variety developed locally.

The possibilities of further rice production are still considerable, not only in the older regions like the Paraíba Valley and in the north, but also in Goiás and Mato Grosso as adequate transportation becomes available. Rice culture might also be expanded and improved in the São Francisco Valley.

Wheat: Chief Deficit Crop

Wheat is Brazil's chief deficit crop. Average annual imports during the period 1941-1945 amounted to 38 million bushels valued at $42.3 million. In addition, imports of wheat flour averaged 615,000 barrels valued at $4.3 million. The value of these imports was 14 per cent of the total value of all imports. The drain on foreign exchange resources resulting from the high price of wheat in recent years has again stimulated the interest of the Brazilian authorities in extending domestic production.

At the end of the eighteenth century Rio Grande do Sul produced substantial quantities of wheat, part of which was shipped to Rio de Janeiro and the Rio de la Plata region,

but the industry was virtually wiped out by a rust epidemic after 1811. Later, German and Italian immigrants began to produce wheat to supply their own needs. Both the federal and the state governments have at various times attempted to revive interest in wheat. In 1937 President Vargas established experiment stations and seed multiplication fields in several states, and introduced the practice of requiring flour mills to absorb the domestic wheat crop at officially established prices, and also of requiring mixtures of wheat flour with other flours, such as corn, manioc and rice. This practice was later discontinued as the result of an agreement with Argentina whereby Brazil obtained advantages for mate in the Argentine market.

During the years 1935-1939 wheat was planted on 442,000 acres, chiefly in Rio Grande do Sul, but to some extent in Santa Catarina and Paraná. By 1946 the acreage had increased to 744,000. Production meanwhile had increased from 135,000 tons to 248,000 tons. The 1947 harvest was 288,000 tons, and the 1948 crop is expected to be even larger.

Most of the wheat has been grown by European immigrant families on small farms in hilly terrain. Some land is plowed, harrowed and rolled, but most of the cultivation is with the grub hoe. Most of the reaping is done by scythe, but threshing is by machinery.

The major difficulty in expanding the wheat harvest has been the development of seed suited to the excessive humidity in some sections and drought in others. In Rio Grande do Sul the heavy rains during the winter months (May to September) sometimes delay planting past the proper time. In Santa Catarina and Paraná, December and January are wet months, hence the crops must be harvested early to avoid losses. Northern Paraná and the states of São Paulo and Minas Gerais have dry winters; drought-resisting varieties are therefore needed. In the chief wheat-growing regions temperatures of 100° F. or over are recorded in January and

February and as low as 15° to 18° in June and July. Freezes are common but snows are rare.

Interest in Mechanized Wheat Culture

For some years efforts have been made to introduce wheat culture in southern Rio Grande do Sul, where most of the land is held in large ranches. There are large areas sufficiently level and free of trees, stumps and stones to permit large-scale mechanical cultivation. Special seed varieties have been developed by a Swedish geneticist at the experiment station in Bagé. The government has imported threshers and other equipment. The flour-milling companies contributed funds to employ two French experts who have studied the baking qualities of Brazilian wheat and the problem of mixtures with other grains.

Under the stimulus of high prices and official support, wheat production reached a high point in 1947, despite some losses from grasshoppers. Some further expansion is anticipated, in view of the determined efforts being made to reduce imports, but it is still premature to judge whether wheat growing on an important scale will become a permanent feature of Brazilian agriculture. Costs of production are high, and enthusiasm may wane once Argentine wheat is again available in ample quantities at more attractive prices. Lands suitable for mechanized wheat growing and close to transportation facilities are expensive.

The governor of the state of Goiás early in 1948 announced a project for increasing wheat production based on attracting experienced United States farmers to take up government lands in that state. The experiment station at Anápolis has been trying out seed varieties adapted to the area. Sufficient information as to the quality of the lands or the suitability of the seed is not available to permit judgment as to the feasibility of the project. The proposed lands are on the plateaus at an average elevation of three thousand feet. Snow and freezing temperatures are unkown, and

extreme heat is rare. There are extensive areas of gently rolling lands without many trees. Roads are few, and transport remains a problem.

Government lands in western Minas Gerais near Patos, previously mentioned in connection with coffee, are also considered as possible wheat lands. Progress in the development of wheat and other crops might be hastened by the introduction of suitable colonists, such as Dutch or Italians. Discussions on these points are now being carried on with the Brazilian government, but the financing has been a major problem.

Oats, rye and barley are grown only in the three southern states, principally by Russian and Polish settlers; total production is small.

Manioc: Food, Starch and Alcohol

Manioc or cassava (known in Portuguese as *mandioca*) was a staple food among the Indians at the time of the arrival of the Portuguese. It is still a staple, being more widely consumed than any other food except corn. It is the main starchy food in the north and northeast, and in various forms is an ever-present item on the tables of rich and poor alike.

Manioc is important in world commerce as a source of starch and tapioca. Before the war the Netherlands Indies were the chief source. Brazilian exports of manioc products became important in 1934, and reached a peak of 134,800 metric tons in 1946. In 1946 the United States imported 285 million pounds of crude and prepared manioc products from Brazil, but imports dropped to 75 million in 1947.

From 1939 to 1943 the mixture of wheat flour with locally grown products (chiefly manioc) was compulsory; it was discontinued as the result of an agreement with Argentina. Thereafter growers reduced their acreage. Construction was started on large distilleries to use manioc as raw material, but most of these were never completed. Under the emer-

gency food plan the Ministry of Agriculture has declined to finance manioc on the same basis as cereals and other crops.

Brazil could provide a large exportable surplus of manioc if steady markets at compensatory prices are assured. The main question is the possible comeback of the Netherlands Indies, from which very little has been received in recent years.

Beans, Potatoes, Fresh Vegetables

Beans are one of the staples of the Brazilian diet. *Feijoada,* prepared with beans, jerked beef, sausage and salt pork, with manioc meal sprinkled over it, is a national dish that appears on all restaurant menus at least once a week. Before the first world war Brazil imported large quantities of beans, but production now takes care of local demand and permits occasional exports. About half of the crop is interplanted with corn. The threshing of the crop has not been mechanized except in rare instances. With more attention to standardization and improvement, Brazil could expand exports appreciably.

Potatoes are an important food item but are less used by the lower classes than beans, corn, manioc and rice. Most of the crop comes from the southern states, where the climate is more suitable than in the north. Brazil still imports seed potatoes, but the government experiment station has made progress in developing satisfactory local varieties. The sweet potato is indigenous and is grown in most states. It is used to some extent as stock feed.

Interest in the production of fresh vegetables is increasing, but the supply is still inadequate and prices are high. Poor transportation and even poorer marketing channels are the main difficulties. Truck gardening has had its highest development around the city of São Paulo, where it was started by Japanese farmers. Onions, garlic, tomatoes, green beans and *couve* (similar to collards) are produced in large quantities. Factories preserving tomato juice, extract and paste are

located at Rio de Janeiro and São Paulo, and at Recife and Pesqueira in the state of Pernambuco.

Sugar Cycles

Brazil is no longer the largest sugar-producing country, as it was in the seventeenth and early eighteenth centuries, but it is among the five largest producers. At present, Brazilian sugar is produced primarily for the domestic market, although Brazil was for centuries an important exporting country. Sugar was the leading export commodity throughout the colonial period and until about 1830. It continued in second place, after coffee, until the last years of the nineteenth century, except for a brief period around 1871, when the value of cotton exports exceeded sugar shipments.

Sugar cane is grown in every Brazilian state. Over one fourth of the total output is in the form of low-grade *mascavo* produced in primitive open-kettle mills known as *engenhos* or *bangüês.* Some fifty thousand of these antiquated mills are still in operation. Of these about thirty thousand are in Minas Gerais.

Pernambuco, the traditional center of the sugar industry, is still the largest producing state, but its supremacy has been challenged by the more efficient producers in São Paulo. During the decade 1926-1935 the São Paulo *usinas,* or centrals, were modernized, and overproduction quickly ensued. A government-sponsored cartel known as the Sugar and Alcohol Institute (Instituto do Açúcar e do Alcool), established in 1933, now undertakes to maintain a precarious equilibrium by assigning production quotas, fixing sales prices and dumping surpluses in foreign markets. After some years of comparative stability, the balance was upset by the war. Owing to the loss of coastwise shipping by submarine action, a sugar shortage developed in the southern states. As a consequence, the production quota for the southern states was enlarged and later the restrictions on the size of the crops were temporarily removed. Production

in centrals rose from 15.4 million bags of 60 kilograms in 1945 to 20.4 million bags in 1947. Meanwhile, consumption increased from 15.7 million to 17.5 million bags.

Brazil has an average per capita consumption of about 61.6 pounds of sugar a year. The little cups of coffee that Brazilians take at all hours of the day are sweetened with several spoonfuls of sugar. Consumption by the canning industry and in the manufacture of fruit pastes is substantial. Large quantities of rum and industrial alcohol are produced. A big anhydrous alcohol industry has been developed since 1933, as the result of regulations requiring gasoline importers to mix a specified percentage of domestic alcohol in the motor fuel placed on sale.

Uncertain Export Outlook

Brazil's exports of sugar averaged 46,674 metric tons annually during 1935-1939 and 43,947 tons during 1940-1944. Argentina and Uruguay are among the principal markets. Since the end of the war various European countries have been in the market, but Brazil has been reluctant to sell without assurance of payment in dollars.

Of the 15.4-million-bag crop in 1945, 8.2 million bags were produced in the north and 7.2 million in the south, although consumption was much larger in the south. The northern producers are still given an allocation in the São Paulo and Federal District markets. Sugar is the mainstay of the economy in Pernambuco and some of the other northern states, but relatively less significant in São Paulo. The northern producers have taken some steps to increase output—irrigation to reduce dependence upon irregular rains, and greater use of fertilizers—but São Paulo appears likely to continue to gain ground, by virtue of better soils and cane varieties as well as more efficient extraction.

Jute and Hard Fibers

In addition to cotton, Brazil produces a number of other textile fibers. Some of these have long been utilized by

handicraft and small manufacturing industries, but their commercial utilization on an important scale dates from the war years. Production for the latest available year is as follows (in metric tons): caroá, 13,500; *guaxima,* 9,600; sisal, 25,000; jute, 10,000; flax, 1,200; ramie, 1,600; and phormium, 1,100.

About half of the caroá production is normally exported. There are also some exports of flax fiber. The available output of other fibers is used by domestic bag and cordage manufacturers. Brazil requires annually about 40 million bags for sugar, coffee, beans, grains and other materials, and furthermore several million pounds of cordage.

Caroá is a native hard fiber that grows wild in the semiarid regions of the northeast. It is used by manufacturers of cordage, paper and cloth and is mixed with jute in the manufacture of bags and of soles for *alpargatas,* that is, cheap canvas-top shoes. During the war, exports to the United States were heavy, but in recent years they have gone principally to Argentina and Uruguay. The fiber is stronger than jute and finer than sisal or abacá. It tends to shrink when wet. The potential supply of caroá fiber is estimated at about 5,000 metric tons a month. Experts who have studied the problem believe that a substantially larger foreign market could be developed provided improved methods of cleaning and grading were adopted.

Malvaceous fibers (*Urena lobata,* known in Brazil as guaxima or *uacima,* and *Hibiscus* spp., popularly called *papoula do São Francisco*) grow wild throughout northern Brazil and have been cultivated to some extent in São Paulo. They are used principally for mixing with jute. Hibiscus is regularly cultivated in the Paraíba Valley, at Tremembé, where it is used in industrial plants of the vicinity.

The commercial production of sisal has been started since 1939, chiefly in Paraíba and adjacent states. All production is used in the manufacture of cordage and bags. Since the only other production of sisal in the Western Hemisphere

is in Haiti, the development of a sisal supply in Brazil is of considerable interest. Present methods of cultivation and cleaning leave much to be desired. There is a basis for considerable expansion of sisal production if purchasing agreements can be concluded with the United States importers and if the industry is organized on a more efficient basis.

Jute Culture in Amazon Valley

Another significant development in connection with fibers has been the introduction of jute culture in Brazil. After several years of experimentation, Japanese settlements in the Amazon Valley succeeded in developing a strain that gives a good yield of fiber. During the war the jute lands were taken from the Japanese, but continued cultivation by Brazilians was encouraged. About 16,000 acres are planted on narrow strips of alluvial floodlands along the banks of the Amazon and its tributaries, with the principal concentration around Santarém, Juriti, Óbidos, Parintins and Manaus. São Paulo jute bag manufacturers have given strong support to this development, for the shortage of Indian jute has created a serious problem in recent years. Small quantities of jute are also produced in the state of Espírito Santo.

There has long been an important jute spinning and weaving industry in Brazil, but before the war it used imported Indian jute. During the years 1936-1940 jute imports averaged 24,000 tons a year.

The agricultural institute at Belém is very much interested in this problem, and expects by the 1948-1949 season to produce 48 tons of selected jute seeds, which it is hoped will give a yield of 24,000 tons of fiber, provided financing and a sufficient number of farmers and workers are available. The manpower problem is the most serious one. Some officials are urging that several hundred additional Japanese farmers be brought into the Amazon area to aid in the development of the crop. Taxes and shipping charges also

burden the industry. It costs twice as much to ship jute from the Amazon to the consuming areas in southern Brazil as it does to ship jute from India to the São Paulo factories.

The peak production to date was about 10,000 tons in 1946. Dr. Brittain B. Robinson, senior agronomist of the United States Department of Agriculture, who recently investigated fiber possibilities in South America, makes the following observations regarding jute:

> The importance of the production of this fiber to the economic welfare of Brazil and in reference to supplying settlers along the Amazon is hard to evaluate. However, it is of more than minor importance, or more than is represented by the cruzeiro total value of sales of raw and manufactured products. To some extent Brazil's jute industry is of interest and importance to all Western Hemisphere countries, since they require jute products. They observe Brazil's jute experimental attempts as something they might adapt to their own country should it prove successful in its competition with Indian jute.
>
> Without some understanding of the basic facilities available to settlers on the Amazon, of farm machinery, labor, interest and value of acquisition of capital gains, ability to devote energy to collecting rubber and other forest products, it is difficult to visualize methods of jute culture which might be suggested that would not entirely be different from the present system and, as such, might not be practical. However, it is also difficult to visualize the present methods of production continuing over a long period of years. A rise in the price of rubber or some other forest product may cause the settlers to pursue the gain of that commodity at the expense of jute.[4]

Dr. Robinson also calls attention to the taxes and shipping charges burdening the industry, and to the possibility of devising better methods of drying jute fibers to prevent fiber deterioration before marketing. There is at present a conflict between the jute and the caroá producers; the proper fields for each should be delineated. Dr. Robinson concludes:

> Efforts should be made immediately to support the production of jute upon the Amazon in order to prevent this industry from disap-

4. *Status of the Fiber Plant Industry in Latin America,* Pan American Union, Inter-American Economic and Social Council, Washington, D. C., December 1947, p. 162.

pearing. Unless some well financed and interested effort is undertaken, the production may disappear or will remain a relatively small primitive industry. The relatively few settlers who grow jute are not likely to exert great efforts to continue this production if the collection of rubber, nuts and other forest products offers a more attractive remuneration with less laborious work.[5]

Flax, Ramie, Phormium

Flax is grown in Brazil principally for seed, but the fiber variety is grown in Paraná and Rio Grande do Sul. The fiber is not of the first quality. In the clothing industry at São Paulo and Pôrto Alegre it is mixed with other domestic fibers.

Ramie is produced to a considerable extent in São Paulo and to a lesser extent in other southern states and Espírito Santo. The industry offers further possibilities provided mechanical harvesting and automatic cleaning machines can be adapted to it. It is used by a São Paulo mill making specialty threads and twines. Ramie fabrics are also sold to compete with cottons and linens.

Abacá and phormium are new and minor fibers in Brazil, but both appear to have possibilities.

In general, the export possibilities for Brazilian fibers depend on regular supplies and better standardization. World markets are not interested in small quantities of poor quality.

Piassava is not a textile fiber but it is extensively used in the manufacture of brooms, brushes, mats and cordage. In Brazil it is used in making hats and baskets as well. It is produced chiefly in Bahia, Espírito Santo and Maranhão. Another variety, the Pará, is softer but does not retain its resilient qualities when wet.

Brazil's Beverages

Of the world's favorite beverages—tea, coffee and cocoa—Brazil is the principal producer of coffee, the second largest producer of cacao beans and the leading producer of mate

5. *Ibid.*, p. 167.

tea as well as an increasingly important supplier of oriental tea.

In Brazil mate is obtained principally by gathering the leaves from wild trees found in the region bordering the Paraná River. In Argentina most of the production comes from plantations in Misiones Territory. Mate is a popular drink throughout southern Brazil. Exports, principally to Argentina, Uruguay and Chile, have declined since 1926, when the Argentine plantations began to attain importance. Since 1936, Argentina has restricted new plantings, first to prevent overproduction, and later in return for an undertaking by Brazil to abolish mixing regulations that reduced the market for Argentine wheat. Both Argentina and Brazil have undertaken to develop markets for refined mate in Europe and the United States. Brazil maintains a trade promotion agency in New York for that purpose. United States imports reached a peak of about $38,000 during the war years, when supplies of oriental tea were low. Brazilian exports of mate to all countries averaged $3.7 million during the years 1940-1944 but increased in value thereafter.

China tea plants were introduced as early as 1812 but planting of Chinese and Indian varieties has become important only since 1920. The principal plantations are in São Paulo and Minas Gerais. Brazil-grown tea is now served throughout the country, and since 1940 a net export surplus has developed.

Cacao, a Thriving Native

Cacao is indigenous to the Amazon Valley. It was an important article of export from Pará during the colonial period. Small quantities are still produced there, but owing to ravages of plant diseases it does not thrive. Over 96 per cent of Brazilian cacao is now produced in southern Bahia, in the valleys of the Jequitinhonha, Pardo, Cachoeira, Contas and Mucuri rivers.

About 25,000 bags of cacao are produced annually in the

state of Espírito Santo on farms in the Rio Doce Valley and in the region just south of the Bahia State boundary. Plantations have been developed there since 1920. Total output is less than in the states of Pará and Amazonas, but prospects are more favorable since the area is free of the more destructive plant diseases. Health conditions have been unsatisfactory, owing to the prevalence of malaria, but sanitary works are now in progress. Cacao plantations derive moisture and fertility from the overflow of the Rio Doce. Some students of the problem see large possibilities for expansion of cacao in the Rio Doce Valley, but others feel that rainfall is less satisfactory than in Bahia.

At the beginning of this century Brazil followed Ecuador as the second largest cacao producer. Production increased steadily, under the stimulus of good prices and rising world demand. By 1911 Brazil overtook Ecuador, and held first place until in turn she was surpassed by the African Gold Coast around 1920.

Brazilian cacao production reached a peak of 138,000 tons in 1937 and declined thereafter. The tremendous expansion of low-cost cacao in West Africa brought the average price during the 1930's down to about 6 cents a pound; this discouraged new plantings and induced neglect of older plantations. The wartime price of 8 cents was not sufficient to arouse interest. With the spectacular price increases in 1946 and the decline in West African production, the Brazilian crop in 1947 rose to a new peak of about 145,200 tons. The outlook for expansion of cacao production is promising. Leonard J. Schwarz of the American Cocoa Research Committee states that "undeveloped land suitable to cacao culture is still comparatively cheap and plentiful in Bahia." [6] He estimates the "good cacao soil" in Bahia as sufficient to produce crops two or three times the size of current harvests. All but 20,000 hectares (49,420 acres) of the first-class lands

6. *Documentary Material on Cacao,* Pan American Union, Inter-American Economic and Social Council, Washington, D. C., May 1947, Part I, p. 24.

in the Ilhéus-Itabuna zone have been taken up, but practically all of the 50,000 hectares (123,550 acres) of second-class soil is available. Lands can be bought from the state at prices ranging from ten to twenty cruzeiros a hectare ($.20 to $.40 an acre). Since the rise in prices little turnover in cacao farms has occurred, but purchases of young plantations in full bearing and producing fifteen tons of marketable cacao might be had for about $7,500.

The latest census shows 23,000 cacao farmers in Bahia, of whom 21,000 have farms producing fifteen tons of beans annually or less. These small farms account for 40 per cent of the harvest.

Activities of Cacao Institute in Bahia

A state institute (Instituto de Cacau da Bahia) was established in 1931. It established warehouses, provided credit facilities and built roads and schools in the cacao-producing zones. Funds for building and maintaining roads are provided by a tax of Cr. 2.5 on each bag of cacao for export. About 280 miles of roads have been built and 84 miles additional are under construction. Trucks have replaced mules as the chief transport medium and also compete with the Ilhéus-Conquista Railway. Roads have also had an important social influence throughout the zone.

Fortunately Bahian plantations have not been attacked by the more serious diseases, such as witch broom, monilia and swollen shoot, but the institute has carried on a campaign against ants and other pests that affect the crops. At its experiment station the institute carries on research to find and introduce high-yielding varieties, and to encourage better cultural practices.

The most controversial phase of the institute's work has been its commercial activities. During the years 1936-1941 the institute handled about one third of the crop. During part of this period it also exercised control over prices and sales quotas. From 1943 to 1946 the institute was the sole

buyer and seller of cacao. This monopoly was lifted in the spring of 1946, but on October 22 some degree of control was reinstituted.

Cacao Pressing and By-Products Manufacture

The industrialization of cacao has progressed rapidly in recent years. Begun in 1928, processing of raw cacao rose from about 50,000 bags (of 132 pounds each) in 1939 to 360,000 bags in 1946. Five grinding and pressing mills have a capacity of about 500,000 bags. Cocoa butter and cake are exported, but a substantial part of the output is shipped to southern Brazil, where the butter is consumed by chocolate manufacturers and the cake used by chemical firms producing alkaloids. The wartime growth of the pharmaceutical industry created a market for theobromine and caffeine. Beginning in 1940, these products were extracted from coffee, mate and cacao, but at present cocoa cake is the principal raw material. The principal producer is the São Paulo firm Orquima Indústrias Químicas Reunidas. In 1947, 86 tons of caffeine and 68 tons of theobromine were exported. The processing industry in Brazil received further impetus from the United States–Brazil trade agreement signed October 30, 1947, which, when ratified, will provide for a reduction in United States duties by 50 per cent on cocoa butter and smaller reductions on caffeine and theobromine.

Big Expansion of Citrus and Bananas

Brazil produces a large variety of tropical and subtropical fruits, some of which are little known outside of Brazil. Oranges, bananas and pineapples have had the principal commercial development and are the only ones exported. Before the second world war Brazil had become one of the leading producers and exporters of both oranges and bananas.

Some oranges had long been shipped to neighboring South American countries, but the Brazilian orange was practically unknown in European markets until 1925-1926, when some

experimental shipments were made to England and Germany. These trial shipments were followed by serious attempts to place large quantities on the European markets, but it was found that little headway could be made until the fruit was standardized and marketing methods adapted to the demands of the trade. In 1928-1929 the Brazilian Ministry of Agriculture sent representatives to the United States to study the citrus fruit industry, and a few large Brazilian growers also visited the United States. This move was followed by the construction of three government packing houses (one in the state of Rio de Janeiro and two in the state of São Paulo) and four privately owned plants in the Federal District and the state of Rio de Janeiro. Machinery was imported from the United States for cleaning, grading, coloring, preserving and stamping the fruit.

The annual orange harvest averaged 33.7 million boxes of 70 pounds each during the 1935-1939 period, with a peak of 36.4 million boxes in 1940. Exports during 1935-1939 averaged 4.4 million boxes. During these years Brazil was one of the two or three largest orange-exporting countries.

The principal expansion during the 1920's and 1930's was in São Paulo, Rio de Janeiro and Minas Gerais. Navel oranges principally were produced in São Paulo for export to Europe, and *pera* oranges in Rio de Janeiro and Minas Gerais for shipment to the Rio de la Plata. The United Kingdom was the largest market, followed by Argentina, and then by various continental European countries. Canada took smaller quantities.

Recent Developments

After 1939 the orange industry was seriously affected, first by the closing of the European market and then by an outbreak of the *tristeza* disease which destroyed a large part of the trees with sour-orange root stock. New plantings are now being made with sweet-orange root stock. Some abandoned coffee lands have been planted to oranges. The high

domestic price of fruit stimulated orange planting outside the former export areas. The 1947 harvest was estimated at about 30 million boxes, exports at 2.5 million boxes. Exports have been temporarily prohibited or restricted at various times since 1941 for the purpose of forcing a decline in domestic prices, but in practice little has been achieved.

Experts of the United States Department of Agriculture are cooperating with the Brazilian authorities in the study of the tristeza disease and its control. Study is also being given to storage with a view to enlarging the market by providing larger supplies during the off seasons.

During the war the manufacture of orange oil and concentrated orange juice was begun.

Exports of grapefruit were expanding before the war, but plantations have been neglected because the domestic market is limited. Lemons, limes and tangerines are fairly important local crops.

Bananas are grown throughout Brazil, but production for export has been concentrated along the southeastern coast, chiefly around the port of Santos. Argentina has regularly been the principal market. European outlets were developed by Vestey Brothers of London, operators of the Blue Star Line and other shipping companies. Numerous varieties of bananas are produced in Brazil, but only the *nanica* or dwarf (*Musa cavendishii*) has been important in the export trade.

The 1947 banana crop was estimated at 123.7 million bunches, 28 per cent above the previous five-year average. Exports were estimated at around 7 million bunches, more than double the wartime shipments.

Until 1940, bananas were available at modest prices throughout Brazil. The subsequent increase in price has reduced consumption in the cities.

Pineapples

Brazil is the original home of the pineapple. In flavor and aroma Brazilian pineapples are considered as having no

superior. The principal producing areas are in a belt from Paraíba to São Paulo. Production in 1947 was estimated at 74 million fruits, slightly below the 1942-1946 average. About 2 per cent of the harvest is exported, principally to Argentina. Before the war some shipments were made regularly to Europe. Exports are made chiefly from Rio de Janeiro and Santos. Northeast Brazil is short on suitable woods for boxes and crates.

Strong financial interests have on several occasions investigated the possibility of growing pineapples in Brazil on a large scale, principally for the United States market. One difficulty has been the problem of finding large areas of suitable lands at a price that would be economical. Land prices in São Paulo, one of the chief producing areas, are high. In the northeast suitable lands at the right altitude and convenient to transportation and ports are also scarce. Some attention has also been given to the possibility of developing a source of fresh pineapples for the United States holiday market. Brazilian pineapples are most plentiful in December and January. Shipments by air around Christmas time may offer possibilities.

Pineapples are canned by several factories in Pernambuco. Some exports of canned pineapple have been made since the end of the war.

Table Grapes and Wine

The only nontropical fruit produced in quantities in Brazil is the grape. Rio Grande do Sul is the chief producing state. The area devoted to grapes in that state has remained at around 18,500 hectares (45,700 acres) for some years. Interest in expanding grape production has been defeated by droughts, frosts and other growing hazards. About 15 per cent of the crop is consumed as table grapes, in the area where produced, and the remainder is pressed for wine. Production of wine declined from 595,000 hectoliters (15.7 million gallons) in 1946 to 362,000 hectoliters (9.6 million gallons) in 1947.

About 80 per cent of the Rio Grande do Sul wine production comes from Isabella and other American grape varieties, the remainder originating from vinifera and muscadine grapes. The wines do not enjoy a very high reputation. Imported wines are usually purchased by persons able to afford them. In 1946, 16.4 per cent of the wine shipments was made in bottles. There are three champagne producers in Rio Grande do Sul, two of whom use large containers and accelerated fermentation while the other produces according to the traditional means of slow fermentation in one-liter containers.

There is a state wine institute which exercises certain inspection and control functions and also furnishes grafts and technical aids to the producers. It has not entered into business.

Table grapes are grown around Jundiaí and Campinas, in the state of São Paulo. During the last decade, imports of grapes have ranged from 1,700 tons to a peak of 4,200 tons in 1947, with Argentina as the principal supplier and the United States and Portugal following.

Deciduous and Tropical Fruits

Some peaches, pears, prunes and apples are grown in southern Brazil, principally in Rio Grande do Sul. Nevertheless, imports of nontropical fruits are substantial. They increased from 21,000 tons to 40,000 tons between 1939 and 1946. Argentina is Brazil's largest supplier of table fruits. It has furnished 72 per cent of the imports since 1937, followed by the United States with 21 per cent.

Quince and guava trees grow wild in the hills of central Brazil. These fruits are used in the manufacture of fruit pastes, or *goiabada,* a standard dessert dish in Brazil. Fresh papaya is on the menu of Brazilian restaurants three times a day during the season. Cashew grows spontaneously along the coast and the sandy uplands of north and northeast Brazil; the fruit is plentiful from November to January.

Mangoes grow in the parks and gardens and along the streets of northern Brazil, but commercial production is limited. Avocados are found in all markets; avocado paste is served as dessert rather than as a salad. Tamarind, assai (*pinot*) and granadilla or passion fruit are used widely as flavors for ices and drinks in Brazil, and might be developed for export.

Another typical Brazilian product that contains alkaloids and is used to prepare stimulating drinks is the *guaraná,* which is cultivated principally by the Maués Indians in Amazonas. A paste or essence is prepared from the seed. Guaraná-flavored drinks are sold throughout Brazil. It is also used in proprietary medicines.

Tobacco

Tobacco has been an important although secondary crop since early colonial times. Bahia was the most important producing state until 1938, when Rio Grande do Sul attained first position, although Bahia has again taken the lead in one or two years. Minas Gerais, Santa Catarina, Pará and the northeastern states are also important producing regions.

A large part of the production in Rio Grande do Sul and Santa Catarina is used for cigarette manufacture. A surplus of air-cured tobacco is normally available for export. Some Santa Catarina tobacco is used in the manufacture of cigars and small cigars of a popular type. The Minas Gerais crop is used mostly to produce the ropelike twist popular in rural Brazil.

Bahia has traditionally been a large exporter of leaf tobacco and the center for cigar manufacture. Most of the crop is grown in the Recôncavo, the rich alluvial strip around the Bay of Todos os Santos. Before the war Germany and the Netherlands were the chief markets, followed by Argentina. When the closing of European markets resulted in reduced exports, some growers turned to food crops and castor beans. The outlook has improved somewhat as the result

of purchases by Spain and the Rio de la Plata countries. Various European countries have been in the market but could not offer dollars in payment. Early in 1948 some exports against payment in sterling were authorized.

The United States does not provide a market for Brazilian tobacco or cigars, owing to the preferential duty rates accorded Cuban products.

The Cycle of Rubber

The story of rubber in the Amazon combines romance, frenzied finance and tragedy. Brazil was the chief source of rubber during most of the nineteenth century and through the first decade of the twentieth. For a brief period rubber rivaled coffee as the most valuable Brazilian export product. But the boom was short-lived. Rubber from Middle Eastern plantations, started with seed of the *Hevea brasiliensis* carried to the East in 1876, was supplying half of the world demand by 1914 and thereafter conquered most of the world markets.

Brazilian rubber production reached an all-time peak of 37,500 tons in 1912 and declined thereafter down to 6,000 tons twenty years later. During the prewar years production revived to around 15,000 tons; it rose to 30,000 tons in 1945 and 1946 under the stimulus of high prices and wartime measures of assistance. Production in 1947 in all Brazil was 33,000 tons, of which 31,500 tons were produced in the Amazonian area and 1,500 tons in other areas. This total undoubtedly includes some rubber from Bolivia, which was smuggled into Brazil to take advantage of the higher prices paid during the first half of that year under the Brazil–United States rubber agreement and later in accordance with Law No. 86 of September 11, 1947, which maintained the previous schedule of prices until the end of 1950.

This law continued the Rubber Credit Bank (Banco de Crédito da Borracha, S. A.) as the sole purchaser of rubber and gave it responsibility for disposing of the surplus over domestic consumption. It also established the Rubber De-

fense Commission (Comissão Executiva de Defesa da Borracha), with authority to establish import control, maintain stocks for domestic requirements, collaborate with the Rubber Credit Bank in establishing prices charged manufacturers, establish rubber prices after 1950, and make recommendations regarding the return to a free market.

Domestic consumption of rubber in 1947 was about 22,000 tons. As only part of the output of rubber was absorbed by Brazilian rubber-goods manufacturers, and as foreign demand collapsed at the termination of the United States purchasing agreement (since the pegged price was several times the world price), the rubber bank found itself in difficulties at the end of the year. From the beginning of 1948 the bank has paid only 60 per cent of the official price for rubber, pending an appropriation by the Congress to enable it to carry out its undertakings under Law No. 86.

Shipments of Brazilian natural rubber from all ports during 1947 amounted to 26,650 net tons, of which 9,430 tons were exported to the United States and 17,220 tons were shipped to factories and merchants in southern Brazil. There are some rubber-manufacturing plants at Manaus and Belém, but the principal ones are located at São Paulo and Rio de Janeiro. During 1948, production and exports of rubber declined drastically.

Brazilian rubber is derived principally from wild trees scattered over an enormous area. During the early nineteenth century a large part of the Amazonian rubber came from the *Castilloa elastica,* but thereafter *Hevea* became the chief source. In Brazil the *Castillas* were cut down in the process of rubber extraction, with the result that most of the accessible trees of that variety were destroyed. The shift to *Hevea* was also hastened by the discovery of new methods of tapping *Hevea* that increased the yield and preserved the tree. During the war rubber was also gathered from *mangabeira* and *maniçoba,* but there is no internal market for these types.

Ford's Costly Experiments

Many attempts have been made to develop rubber plantations in Brazil, but none has succeeded. The most ambitious attempt was that of Henry Ford at two plantations on the Tapajós River, starting in 1928 at Fordlandia and in 1935 at Belterra, about thirty miles up the river from Santarém. At Fordlandia, ninety miles upstream from Belterra, some 500,000 of the best varieties of native rubber trees were planted, but the low yield from these varieties made the operation uneconomical. Furthermore, the site proved to be unsatisfactory from other points of view. At Belterra 3 million trees were planted and grafted with high-yielding stock developed from the best of Far Eastern clones. By 1943 the plantation was threatened by the leaf disease, but most of the trees were saved through top-budding with disease-resistant native species. At the end of 1947 about 50,000 trees were being tapped, and a total of 550,000 were expected to be ready during 1948. These trees are expected to yield on the average about five times as much per acre as wild trees.

Since Belterra was taken over by the Brazilian government in 1945 it has continued operations with an American manager under the direction of the Instituto Agronômico do Norte at Belém. Both before and since the transfer Belterra has been an important center for rubber research and has made very valuable contributions to the knowledge of the entire problem. Nevertheless, the future of large plantations of the Ford type in the Amazon basin appears doubtful, owing principally to the difficulty of recruiting and holding labor. The authorities hope gradually to expand rubber production through the establishment of small farmers cultivating rubber as a cash crop. The plan is to settle colonists on tracts of about nine hectares (twenty-two acres), of which five would be in rubber and the remainder in other tree crops and grass. Officials of the Ford estates and various specialists of the United States Departments of Agriculture and Com-

merce have, since 1941, cooperated with officials of the Instituto Agronômico do Norte in laying the foundations for the program. Dr. Hans G. Sorensen, senior agronomist of the United States Bureau of Plant Industry, has recently been undertaking agronomic studies of selected materials and their vegetative multiplication in large-scale field experiments. Selected stocks are furnished settlers on the colonization projects at several points in the valley.

Although the Amazon basin is the original home of *Hevea,* it is not the only area in Brazil where rubber plants will grow, and may not be the best area. Rubber thrives in southern Bahia, where it was originally planted as shade for cacao trees.

Neutral observers doubt the wisdom of the government's decision to support the wartime price of rubber until 1950. The domestic market cannot absorb the full Brazilian production called forth by the established schedule of prices, to say nothing of the rubber that comes across the border to get the advantages of the Brazilian price level. It will cost the government about $5 million, and will hamper and delay steps to solve the problem along practical lines.

Oilseeds and Nuts

Production of oilseeds and nuts, the processing of these into vegetable oils and the manufacture of edible and industrial derivatives have expanded greatly during the last fifteen years. Cottonseed is the principal item, accounting for over half of the total, even at the lower scale of production during the last few years. Meanwhile, castor beans and peanuts have become increasingly important. Strange words like babassú, oiticica and tucum have acquired significance in the oilseed trade.

Record exports were achieved in 1941, when 272,000 tons of oilseeds and kernels and 56,000 tons of oil were shipped. Another high point was reached in 1945, but the export surplus has dwindled in view of the recession in cotton planting and the mounting domestic consumption of fats and oils.

The decline in shipments of edible oils has been drastic. Exports of cottonseed and cottonseed oil have practically ceased. Peanut planting has increased sharply as lands have been withdrawn from cotton, but an export ban on peanut oil has been in effect since August 1946. Babassú nut oil is used both for edible purposes and for making soap. Brazil is estimated to have hundreds of millions of babassú palms, centering in Maranhão and Piauí, but production has been disappointing, and the larger part of the output is going to domestic factories. The Brazilian government is encouraging the planting of soya and sesame, but both crops are small.

Brazil has become an important supplier of drying oils, principally castor and oiticica. Castor materials are exported primarily in the form of seed. Since 1936 the United States import duty on castor seeds has been only one fourth of a cent a pound, while the rate on the oil is three cents a pound. The United States–Brazil agreement signed at Geneva on October 30, 1947 provides for a 50 per cent reduction in the duty on castor oil. Brazil is the world's largest producer and exporter of castor beans. Production of tung and flaxseed has increased in the southern states, but the entire output is consumed in the country.

The oiticica tree grows along the streams of northern Brazil with the greatest concentration in Ceará and Paraíba. Crushing of the seed at Fortaleza began at the end of the 1920's, but another decade was to pass before technical difficulties were solved and the oil accepted as a suitable substitute for tung oil, which China was unable to export because of the unsettled conditions in the Far East. Production of oiticica oil fluctuates widely from year to year, depending on foreign demand and the availability of seed.

Factors Affecting Expansion

There are large possibilities of further expansion in output of vegetable oils, but in practice developments depend on a number of factors. The principal increase has been in cul-

tivated crops, cottonseed, castor beans (although a large part of the harvest is from spontaneous growths in the north), peanuts, and on a smaller scale, tung and flaxseed. Further increase must compete with other crops for available land, manpower and transport.

The history of babassú and oiticica would appear to confirm the general rule that wild growths cannot, over the long run, hold their own against cultivated crops. After January 1, 1936, when the United States–Brazil trade agreement came into force, babassú kernels were exported to the United States on a large scale. Babassú kernels were bound on the free list during the life of the agreement. This had the effect of exempting babassú from excise taxes that curtailed United States imports of other oils. Babassú oil is similar in its properties to coconut oil. It has the same percentage of extraction as copra and has also a high lauric acid content, which provides quick lathering qualities in soap. During the war vigorous efforts were made to expand production. The United States government provided funds and facilities for the rehabilitation of highways and railways and for the development of a machine for cracking the nuts. The output reached a peak of 72,000 tons in 1945 but has since declined. Furthermore, the demands from domestic consumers have left only a small surplus for export. The potential supply of babassú nuts is sufficient to make up the entire deficit in world oil production, but the areas are inaccessible and large amounts of labor are involved in gathering and cracking the nuts. Owing to the great pressure required to crack the nuts it has not yet been possible to devise a light machine that could be readily transported to the producing centers.

Oiticica, like babassú, is derived from seed obtained from wild trees that grow over an extensive area. Collection and transportation present problems here also. Plantation development of oiticica might be a possibility, but the market for the oil depends on the availability of other drying oils, particularly tung, which is again being shipped in large

quantities from China and is produced in the southern United States.

Varieties of Oil-Bearing Palms

A wide range of other nut palms grows in the Amazon basin and in northern Brazil. Production and exports of tucum nuts and oil have increased sharply since 1944. Tucum oil is in some respects similar to African palm oil. Piauí is the leading producing state, followed by Maranhão and Pará. *Murumuru* and andiroba kernels are collected in the Amazonian states; most of the supply is used by local soap manufacturers. Small quantities of Brazil nuts are crushed for oil. The *ouricuri* palm (also known as *licuri* and *uricuri*) furnishes both a wax and an oil-bearing nut. Commercial production centers in Bahia, where *dendê* palm nuts are also exploited. *Curuá,* produced in the state of Pará, yields an oil similar to babassú but the supply has diminished. *Ucuuba* seeds, containing some lauric acid and a high percentage of myristic acid, are gathered on the Amazon and its tributaries. A few hundred tons of ucuuba tallow are exported annually.

About six million coconut trees grow along the Atlantic Coast from Rio Grande do Norte to Bahia. Some are spontaneous growth and some are planted. Only a part of the nuts are processed into oil; the bulk of the crop is consumed as food locally. Owing to the appearance of red ringworm in the coconut groves, production is expected to decline.

Edible Nuts

The Brazil-nut tree, which grows throughout the Amazon basin, is the monarch of the forest, towering above the surrounding jungle. The thick trunk makes good saw timber, and the bark is also utilized, but its chief value lies in its large, nutritious nuts. The gatherers are frequently migratory, but some establish semipermanent homes at the water's edge and plant crops of manioc, rice or bananas. From this base they cut trails through the underbrush to a sufficient

number of nut trees to keep them busy during the season. The nuts are transported by water to a trading post, and are eventually concentrated at Belém or Manaus, the principal export centers.

Before World War II, Europe was the principal market, but a demand developed in the United States after 1914. Shelling plants were established at Belém and Manaus, beginning in 1926, and a substantial part of the exports go out as shelled nuts. Shipments reached a high point around 1935 and again during the early 1940's but declined thereafter as labor was diverted to the collection of rubber. The outlook at the beginning of 1948 was less favorable than for many years.

The fruit of the cashew tree has long been popular, especially for use in making a refreshing drink and in the preparation of jellies and preserves. The nut, which grows on the skin of the fruit, has been utilized only within recent times, both for domestic consumption and for export. At Fortaleza there is a large shelling and packing plant which also manufactures oil from the cashew shell for use in brake linings and as a lubricant for magneto armatures in airplanes.

Waxes

Brazil produces several useful waxes, of which carnauba is commercially the most important. The carnauba palm grows in an extensive area of Brazil, but wax is formed on the leaves only in the dry northeastern states, chiefly Ceará, Piauí, Maranhão and Rio Grande do Norte. Most of the wax is derived from wild trees, but some plantings have been made. The wax, in powder form, is obtained by drying, shredding and beating the leaves. Improved mechanical processes for performing these operations were introduced in 1938 by S. C. Johnson and Son, Inc., of Racine, Wisconsin, at their Raposa plantation near Fortaleza. Refining by improved processes is also carried on at Fortaleza and Parnaíba.

Carnauba wax finds wide use in the manufacture of polishes, carbon paper, phonograph records, insulating materials, electric batteries and the like. During the war it was in demand as a protective coating for castings and machine parts shipped to war zones.

Exports increased from about 3,500 tons before the first world war to 9,000 tons in 1938 and rose further to 11,000 tons in 1941 and 1944. Prices rose to $1.68 a pound in 1946 and the early part of 1947, but dropped to 72 cents a pound later in 1947 owing to increased competition from substitutes. For some applications, ouricuri wax, another Brazilian product, candelilla wax from northern Mexico or synthetic waxes may be used in place of carnauba. Germany had synthetic wax factories before the war, and plants have been erected in the United States and the United Kingdom since the end of hostilities.

The consumption of carnauba wax in Brazil is limited, but some is used in the manufacture of candles and polishes. The fiber, wood and pith of the tree are used locally.

Essential Oils; Crude Drugs

Brazil figures prominently in the crude-drug and essential-oil trade. These products fall roughly into two classes, those derived from cultivated crops produced principally in São Paulo and contiguous areas, and others obtained from native growths in the Amazon basin. In the first group are oil of peppermint, orange oil, lemon oil, lime oil and citronella and lemon grass oil. Cultivation of mint and production of peppermint oil and menthol crystals expanded rapidly in São Paulo, stimulated by high American prices following the loss of the normal Japanese and Chinese supply. Ironically enough, most of the mint cultivation in Brazil was in the hands of Japanese farmers. This industry made large profits for several years, but Brazilian prices are now too high to compete effectively with synthetics and renewed supplies of natural menthol from the Far East.

Production of orange, lemon and lime oil was started in Brazil following the decline in the European market for citrus fruit. Brazil has large eucalyptus plantations and could expand production of eucalyptus oil. Some vetiver oil has been exported.

Brazil has been the chief source of ipecac root, from which emetine is derived. The plant *ipecacuanha* is native to Brazil, Bolivia, Colombia, Venezuela and Central America. Most of the Brazilian production comes from the state of Mato Grosso, in the vicinity of Barra do Bugres. Toward the end of the war Brazil restricted exports of ipecac root in order to build up the emetine factories at São Paulo. Owing to high prices and difficulties of supply, synthetic emetine and alternative sources of ipecac in Central America have been developed.

The Amazon Valley is the main source of copaiba, used in the pharmaceutical, cosmetic and varnish industries. It is called a balsam although it is not a true balsam. Varieties of the rotenone-yielding *Lonchocarpus* plant grow in the Amazon basin, not only in Brazil but also in adjoining countries. It is known in different regions as *timbó,* cube or barbasco. The agricultural research station at Belém has been experimenting to determine the best varieties suited to a timbó plantation industry. Another insecticide produced in Brazil is pyrethrum.

The fragrant rosewood tree grows wild on the more elevated altitudes along the tributaries of the right bank of the Amazon. The wood of this tree contains the important essential oil known as *bois de rose.*

Forestry

Brazil's forests are among the largest in the world. There are three principal forest belts: the equatorial, including the Amazon basin and the state of Maranhão; the tropical forests of the Atlantic Coast and coastal ranges; and the subtropical forests of the southern states.

Historically, the Atlantic region was the first to be exploited. Brazil took its name from the ruddy-colored brazilwood that was a major source of dyes during the sixteenth and seventeenth centuries. Through the wasteful exploitation of this and other woods, as well as the clearing of lands for agriculture, a large part of the mata, or forest, of the northeastern states was destroyed. The most important remnants of this belt are found in the Rio Doce Valley in the states of Espírito Santo and Minas Gerais. In recent years the lumber industry has expanded in this region, and a plywood factory was constructed at Governador Valadares. Since 1938 the most valuable timber—*jacarandá, cedro, jequitibá* and *peroba*—has been cut off in some sections.

Amazonian Woods

The more accessible parts of Amazonia have yielded considerable amounts of wood, but serious development encounters formidable obstacles: climate, disease, inaccessibility of the trees, shortage of manpower and the low yield per acre of merchantable species of timber. Normally the European market accepts a larger variety of species than the United States. From Pará, England takes *jacareuba, quaruba, louro, araracanga, cupiúba* (*goupia*) and *mandioqueira,* as well as mahogany, cedar, andiroba and special-use woods. Portugal uses some of the more expensive woods, *pau amarelo, freijó, maracauba.* The United States takes a more limited assortment. It wants chiefly the mahogany, cedar and andiroba, together with special-requirement woods in small quantities.

The Brazilian woods, other than the mahogany types, are relatively little known in the United States, and hence in normal times must compete with the better known oak, birch and gum. During boom times, Amazonian labor becomes scarcer and more expensive, since other and more profitable forms of forest activity attract the limited amount of manpower.

Amazonian woods also find some market in coastal and southern Brazil: flooring blocks of acapú, sucupira and pau amarelo, planks and boards of *itaúba, marupá,* louro and various other varieties. The favorite furniture wood of Belém is maracauba. Various types of white or soft woods are used for box manufacture.

Various European governments, as well as the Union of South Africa, have been interested in obtaining railway ties from Amazonian sources, as tests have shown the durability of various species, but shortage of labor and high shipping costs, as well as lack of dollars abroad, have prevented the execution of any large contracts.

There are said to be some fifteen hundred arborescent species in the state of Pará, but only twenty or thirty of these have any consistent commercial use. Perhaps twice that number could be established under favorable marketing conditions. Contrary to popular belief, a large part of the trees of the humid tropical forests produce soft, lightweight, perishable woods. However, in some sections, it is claimed, as much as three fourths run to hardwoods, predominantly reddish-brown in color. Eugene F. Horn, a trained forester who has spent many years in South America, suggests that the solution of the problem of developing the Amazonian forests may lie in large-scale operations, including sawmills, plywood factories, pulp mills and wood distillation plants, so that all species on a given tract could be utilized. The cut-over lands could be planted to species that yield nuts or essences and at the same time provide usable lumber within a reasonable time, such as the Brazil-nut tree, the sapucaia, the tonka tree, and the andiroba, which yields an oil nut as well as a mahogany-like wood.

Characteristic woods of the coastal and central forest regions are jacarandá (Brazilian rosewood), *ipê,* peroba, *putumujú,* vinhatico, *pau Brasil* (brazilwood) and *Gonçalo Alves.* At least one variety of jacarandá is found in every

Brazilian state, but commercial production and exploitation are centered in Espírito Santo and Bahia.

The Southern Pine Belt

The principal woods of the southern regions are the so-called Paraná pine, *imbuia, peroba rosa* and varieties of ipê and canela.

The Paraná pine is commercially the most important tree exploited in Brazil at the present time. It occurs in extensive and relatively important stands in the states of Paraná, Santa Catarina, northern Rio Grande do Sul and southern São Paulo. The number of trees is estimated at 162 million.

The commercial development of the pine lumber industry began around 1912, with the introduction of American machinery and new methods of logging and sawing. The first world war gave a big impetus to the industry. Prior to the war Brazil had imported about 80 million feet of lumber annually, chiefly softwoods from the United States and Canada.[7] After the war Brazil continued to import substantial quantities of lumber into certain sections of the country, but also developed regular exports of pine timber to the La Plata countries. In 1939 pine exported amounted to 308,000 tons valued at $4.2 million, out of total lumber exports of 387,000 tons valued at $5.7 million. During the war years exports fell below this level in quantity, owing to inadequate transport facilities and the growing domestic consumption, but the value of exports rose steadily. In 1946 exports of pine timber reached a new peak of 450,000 tons valued at $30 million. Exports continued upward during 1947 but declined in 1948.

Total timber exports in 1946 were 539,000 tons valued at $35 million. The other principal species exported were cedro,

7. During the construction of the Madeira-Mamoré Railway, at the time of the Amazon rubber boom, it was found more economical to import jarrah crossties from Australia than to use Brazilian timbers adjacent to the right of way.

imbuia, *aguano,* jacarandá, peroba, maracauba, canela, *louro vermelho,* ipê and jequitibá. Smaller quantities of about twenty other varieties were exported.

Argentina and Uruguay continue to be the principal foreign markets, especially for pine and cedro. The United Kingdom and the Union of South Africa are important markets. The United States takes some pine in some years and is the leading market for jacarandá, aguano and various cabinet and specialty woods.

Destruction of Forests

Forests in central and southern Brazil are being depleted rapidly through clearing land for agriculture and cutting for firewood and charcoal. In São Paulo and northern Paraná, for example, large areas of forestland have been cleared during the last fifteen years. In a land-clearing operation the more readily salable trees are marketed, but scrub and noncommercial varieties are burned. In some sections greater use could be made of the timber if transportation or markets were available. In developing his rubber plantations on the Tapajós River, Henry Ford erected a sawmill, brought in forestry experts and gave the woods a good marketing test, but discovered that it did not pay to attempt to save any woods except those he could use in his own operations.

The major use for wood in Brazil is as firewood. Production statistics based on a state-by-state survey showed that in 1941 production of firewood amounted to 90.5 million cubic meters. In addition, 618,000 metric tons of charcoal were produced. Lumber production amounted to 5.6 million cubic meters; crossties, 5.6 million ties. The railways alone are estimated to use 10 million cubic meters of firewood annually, as well as 6 million crossties and 10,000 telegraph posts, the total equivalent to the forest cover on 35,000 hectares (about 86,000 acres).

To meet the firewood problem the Paulista Railway in

1904 began experimenting with the planting of eucalyptus trees. At present it plants over three million trees annually. The Mogiana Railway has adopted a similar policy. Some other large concerns that are large consumers of wood, such as the Belgo-Mineira iron and steel works, also have reforestation programs. The National Pine Institute (Instituto Nacional do Pinho), created in 1941, has established national parks and reserves and distributes about a million seedlings annually. Altogether about six and a half million trees a year are planted by farmers and large companies.

Other varieties in addition to eucalyptus are being planted. The *Acacia negra,* or black wattle, was introduced into Rio Grande do Sul from South Africa in 1928. It now covers about 20,000 hectares on which there are 40 million trees, and plantings are expected to increase up to 200 million trees. It grows well on eroded soils. It is planted chiefly for the tannic extract it yields, but it also supplies firewood.

The industrial uses of wood are expanding, in the manufacture of plywood, pulp, airplanes, matches, spools and bobbins, and wooden shoe soles and heels. American dogwood and persimmon are still imported for use in making shuttles for looms. The Institute for Technological Research at São Paulo has played an important part in the research and tests involved in finding woods suitable for airplane propellers and fuselages.

Brazil has great forest reserves strategically well located with reference to markets in the United States, Europe and South Africa. The country has an unrivaled variety of hard and soft woods. But costs are high. Labor is scarce and expensive. Logging operations have been mechanized very little. Tree-felling is chiefly manual. There is great waste both in cutting the trees and in most sawmills. Roads and railway transport impose limitations on the volume of movement. Ocean freight rates are high, the charges on planks from Manaus to New York being $60 per thousand feet as compared with $26.75 from Portland or Seattle.

Cork-Yielding Trees

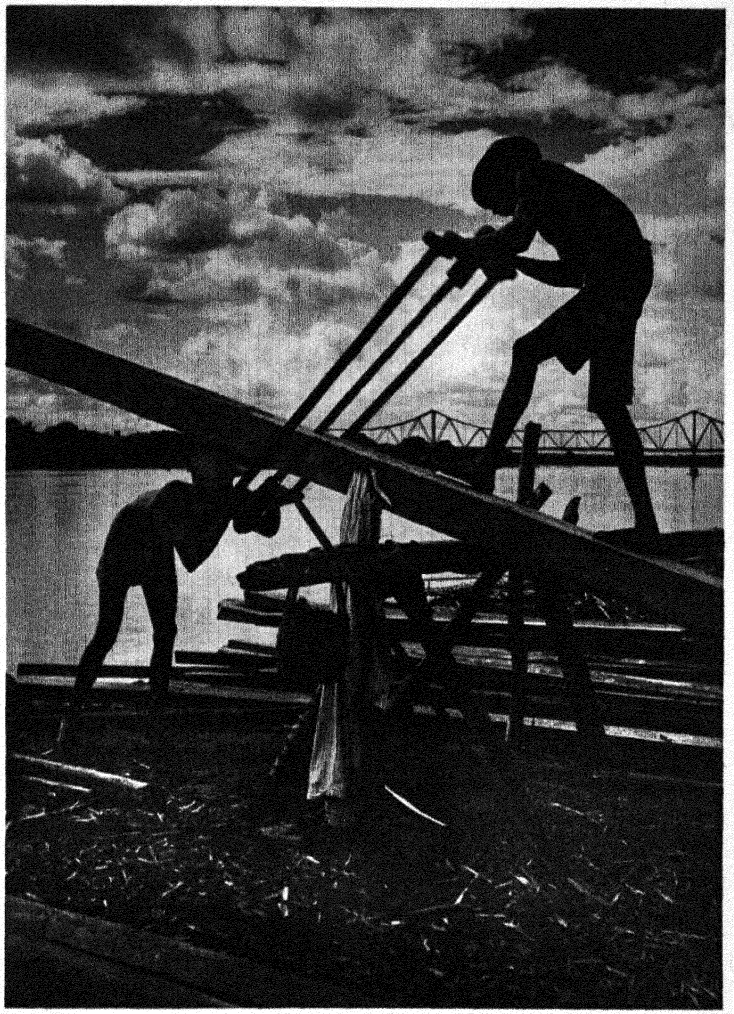
Brazil possesses various woods suitable for special uses, but development has been held back on account of inadequate transport or other obstacles. *Kielmeyera,* varieties of which are known by the name of *pau santo,* has a thick bark suitable for cork. During the first world war cork from stands of pau santo found near Sorocaba (São Paulo) was used for insulating the Armour packing plant at São Paulo city. A firm at São Paulo manufactures insulating materials from the pau santo bark. The tree is found in scrub forests at a fair elevation. It is most numerous in southeastern Goiás, western Minas Gerais and Mato Grosso. Several American firms have investigated its possibilities, but since the tree is seldom found in stands, it would be necessary to develop plantations in order to have an assured supply of bark.

Animal Husbandry

Grazing is Brazil's oldest and most widely spread industry. In most years the value of meat production alone exceeds the value of any single farm crop. Livestock numbers in 1946 were as follows (1940 census figures in parentheses): cattle, 46.4 million (34.4); hogs, 23.8 million (16.8); sheep, 15.5 million (9.3); goats, 7.4 million (6.5).

Brazil's cattle population is the largest of any South American country, although in value Argentina's yearly production of meat, hides and by-products is considerably greater. Cattle numbers have increased by one third since 1940, but demand for meat and hides has outrun supply. No real surplus exists; some exports are made from Rio Grande do Sul, however, since it would not be economical to ship these supplies to other parts of Brazil.

The principal cattle states are Minas Gerais, Rio Grande do Sul, São Paulo, Goiás, Mato Grosso and Bahia. The two principal surplus areas are central Brazil and Rio Grande do Sul. Mato Grosso and Goiás are essentially cattle-breeding states, supplying thin cattle to the fatteners in São Paulo.



PRIMITIVE AND MODERN METHODS are symbolized by this two-manpower "motor" of a sawmill at Teresina (Piauí), while in the background is an up-to-date steel bridge, built with the aid of modern machinery and technical knowledge.

Minas Gerais is both a cattle-breeding and a cattle-fattening state and has a slaughtering industry of some importance, supplying fresh beef to the Rio de Janeiro market and *charque* (dried meat) for local consumption. In Rio Grande do Sul all phases of the industry are carried on: breeding, fattening, slaughtering, packing for export and preparing charque for shipment to northern Brazil.

The annual slaughter is between 4.5 and 5 million cattle, of which slightly over half are killed in municipal slaughterhouses and the remainder at packing establishments. Slaughter ages are high, from five to seven years, as compared with two in the United States. This results from poor grass, debilitating climate and parasites, and inadequate attention. In recent years, however, the São Paulo fatteners have greatly improved their grazing lands, adopting grasses, such as the *colonião,* that will carry twice as many head as was possible under previous conditions. Very few cattle are grain-fattened; the poor quality of the soil appears to preclude it on an important scale in the future.

Problem of Refrigerating Facilities

The Brazilian government has proposed measures to encourage the establishment of killing and refrigerating plants in Goiás and Mato Grosso, nearer the breeding centers, on the theory that more meat would be made available by saving the present loss of weight on the long trek to the fattening and slaughtering centers. The bill offers tax exemptions, premiums, freight reductions and partial financing to private capital undertaking such ventures, and provides that, failing acceptance by private initiative, construction may be undertaken by the government. Officials estimate a 20 per cent increase in meat production on the basis of present cattle numbers.

Theoretically, this step appears to be in the right direction, but it anticipates the solution of several difficult problems, notably the provision of adequate transport to consuming

centers. The provision of adequate refrigerating facilities would permit the surplus that comes on the market during the wet seasons when pastures are good to be held back in order to increase the meat supply during the dry months. However, climatic conditions are irregular, and the cattle supply also is sufficiently uncertain at present to make the more remote packing plants a dubious venture from a commercial standpoint. The railways do not have the equipment to move all the live cattle from breeding grounds during the peak season, usually from April to June; furthermore, the movement, involving from 250 to 300 miles, is a slow and uncertain one, and the cattle are not fed or tended during the trip.

As refrigerating facilities do not exist outside of the large cities, which are principally in the south, most meat is sold within twenty-four hours after the slaughter, or is turned into charque, which is an important article of commerce. At one time some charque was exported from the northeastern states, but for many years that region has obtained part of its supplies from the south, principally from Rio Grande do Sul, where the first *charqueada* was established in 1780.

Boom in Brahmans

Over half of the Brazilian cattle have Brahman or Zebu strains. Several varieties of Brahmans were introduced from India during the latter part of the nineteenth century and have been crossed with native breeds. Brahman cattle are able to stand the hot weather and are not seriously affected by insects, although they lose weight from hoof-and-mouth disease. In the south, especially in Rio Grande do Sul, herds of Hereford, Shorthorn, Aberdeen Angus, Normandy and Devon breeds exist. The United States type of Hereford is the most popular breed. The French Charolé breed is also popular in the uplands, and Holsteins are a leading dairy breed here and elsewhere in Brazil. Brahman stock is increasing, however, especially in northern Rio Grande do Sul.

The cattle population of Rio Grande do Sul has increased very little since 1920. The biggest increase has occurred in Minas Gerais, where eroded lands have been shifted to pasture, and in other central and southeastern states.

Bank loans to Zebu breeders increased rapidly during 1944 and 1945, resulting in very high prices for Zebu bulls but very little increase in cattle numbers. The inflation reached such a dangerous point that when credit restrictions were tightened it was found necessary to provide for a moratorium on a large part of the cattle loans.

Meat Exports

Exports of refrigerated and canned meat started during the first world war. Several foreign-owned companies established plants in Rio Grande do Sul. Swift has plants at Rio Grande and Rosário, Armour at Livramento, on the Uruguayan border, and Anglo, a Vestey interest, at Pelotas. Swift also has a plant at Utinga, near São Paulo, and Anglo has a plant at Barretos, in northern São Paulo State near the border of Minas Gerais. Armour also operates in São Paulo. Wilson and Company has plants at Osasco, near São Paulo, and at Ponta Grossa in Paraná. The principal Brazilian packing plants are the I. R. F. Matarazzo at Jaguariaíva (Paraná); Frigorífico Cruzeiro, Ltda., at Cruzeiro (São Paulo); and Frigoríficos Nacionais Sul Brasileiros, with plants near Pôrto Alegre and in the upland region north of that city.

During the years 1916-1920 exports of refrigerated meat averaged 56,000 tons and canned and salted meat 10,000 tons annually. Shipments reached a peak of 100,000 tons of refrigerated meat and 48,000 tons of preserved meat in 1940. In 1947 exports were 17,500 tons of refrigerated and 18,800 tons of preserved meat.

Meat Shortage

During recent years the shortage of meat at Rio de Janeiro and São Paulo has been such that no exports from that region

have been permitted. During 1948 the packers in Rio Grande do Sul are expected to supply 4,000 tons of frozen meat to the Rio market.

The eight states on the northeastern "hump" of Brazil have about seven million cattle, consisting principally of local breeds that are capable of withstanding hard conditions. Cattle having Brahman blood are known as Indú-Brasil or as one of the subgroups Guzerat, Nellore or Gyr. Oxen, widely used for the work of the cane fields along the coastal zone, are a factor in the large cattle population of the area. The cutover cane lands are used for pasture. In the interior, cattle are fattened during the rainy season and are then driven overland to the coastal market while the grasses are still green. The herders pay a small fee for pasturage en route.

The island of Marajó at the mouth of the Amazon River has long been an important grazing area. Considerable numbers of cattle are also found along the upper Rio Branco, near the Venezuelan border.

There is ample room for expansion of the grazing industry and for improvement in herds and methods. The *triângulo,* or panhandle, of Minas Gerais has developed in recent years and has been the center of the "Zebu inflation." French and English interests have large ranches in Mato Grosso. The towns of Vacaria and Maracaju, south of Campo Grande, are cattle centers. A railway from Campo Grande southward along the plateau is rapidly being completed to Ponta Porã, on the Paraguayan frontier, and settlers are taking up farm lands. Goiás is also receiving attention.

Calf mortality in Brazil is very high, ranging from 15 to 20 per cent in São Paulo to 60 per cent in the state of Pará. In some sections, principally in the south, cattle are dipped for ticks and are vaccinated against hoof-and-mouth disease. Agencies of the Ministry of Agriculture and private laboratories produce vaccines, but the total output is only about three million doses annually.

Opportunities in Dairying

Dairying has been receiving greater attention in recent years. Holsteins are the chief dairy breed. Minas Gerais, Rio de Janeiro, and São Paulo are the principal producing states. Raw milk production at federally inspected plants in 1946 was 205 million gallons. Exports were negligible, but imports amounted to 6,588 tons, of which half was butter and a substantial part powdered or condensed milk. Imported powdered milk is used in the manufacture of ice cream by the one modernly equipped factory at Rio de Janeiro. A milk products concern affiliated with Nestle has plants at Araras and Araraquara in São Paulo and Barra Mansa in Rio de Janeiro State. The cities of Rio de Janeiro and São Paulo are each supplied by two or three dairies that produce high-grade milk, but the supply is inadequate to meet the demand.

Milk production is increasing steadily. The output in 1946 and 1947 was curtailed by the shortage of feed, especially cottonseed cake. The São Paulo end of the Paraíba Valley is the largest producing center. Many milk stations are found along the Central Railway. Part of the milk is pasteurized before shipment, but most of it is shipped to São Paulo in tins for pasteurizing and bottling.

Cheese production is also increasing. The most popular types are *minas, prato,* cottage and *parmesão.*

The Hog-Corn Belt

Brazil has three fourths of the hogs in South America. Hogs are raised chiefly in the corn belt—Rio Grande do Sul and neighboring states, Minas Gerais, São Paulo and Paranã—although several million are raised in the northeastern states. An outbreak of hog cholera in 1946 reached epidemic proportions, but the total number had been restored to about twenty-five million early in 1948.

An official lard-regulating body was established in 1929 by the state government of Rio Grande do Sul. At that time

lard was produced in primitive fashion by small farmers, for whom it was a side line. Packing houses have since been established and refined lard of standardized types is now produced. Lard is exported intermittently but there is little real surplus over domestic needs.

Breeding for Finer Wool

Sheep raising is concentrated chiefly in Rio Grande do Sul, which produces 80 per cent of the wool of the country. Total wool production in recent years has been about 39 million pounds as compared with 35 million before the war.

During 1934-1938 wool exports averaged 10 million pounds, chiefly to Germany. During the early war years wool was exported mainly to the United States, but later wool shipments stopped as domestic demand increased. In 1946 exports to the United States and Scandinavia were resumed. About two thirds of the Brazilian wool clip is fine and medium crossbred, 15 per cent is merino and the remainder coarse crossbred and *criolla,* or native. Fine wools are imported by the domestic woolen industry. Rio Grande do Sul growers have introduced desirable strains from Uruguay and Argentina.

Brazil exports little mutton; in some sections, however, sheep are grown principally for the meat.

Goats are found in most parts of Brazil, but are most numerous in Bahia and the northeastern states. In rural sections practically every family has a doe to provide milk. Factory workers in the cities also have their goats. Goat milk is highly prized for feeding invalids. Herds of does are driven through the streets and stop in front of customers' houses to be milked. Goatskins are an important item of commerce.

Hides and Skins

Brazil is a major source of hides and skins. In South America, Brazil is the leading producer of goatskins and

kidskins, second to Argentina in production of cattle hides and holds fourth place in output of sheepskins. Increasing domestic consumption has slowed down exports in recent years. The annual production of hides and skins is indicated by the slaughter in 1946: cattle, 4.9 million; hogs, 5.2 million; sheep, 1.4 million; and goats, 1.2 million.

The quality of Brazilian cattle hides is affected by bites of insects, particularly the *berne* fly, by branding and by faulty removal at slaughterhouses other than the large packing plants. Despite the large production of cattle hides, Brazilian tanners sometimes have to import calfskins.

In 1946 Brazil exported 31,252 tons of raw hides and skins of all kinds, valued at more than $20 million. Salted cattle hides accounted for 21,233 tons; dry cattle hides, 3,673 tons; goatskins, 1,607 tons; and sheepskins, 1,451 tons. Skins of wild animals exported are normally as follows: peccary, 490 tons; deerskins, 313 tons; ocelot, 347 tons; and capivara, 185 tons. Exports of fish and reptile skins vary greatly but are important in some years.

About two hundred water buffalo hides are produced annually in the Belém area. They are used in Brazil to manufacture power transmission belts. The water buffalo is deserving of more attention in connection with the development of the Amazonian region.

Goatskins from northeastern Brazil, especially Ceará, are considered by the trade as being of exceptional quality. Bahia and the northeastern states supply the so-called *cabretta* skins, which are derived from the hair sheep.

Horses, Mules, Poultry

Brazil is estimated to have about 6 million horses and 4 million mules and asses. Two-wheeled, rubber-tired "buggies" are used to a considerable extent in some parts of Brazil, such as western São Paulo. In the south horse-drawn farm wagons are a common sight on the roads. When roads are impassable, women and men ride horses or mules. The

use of the horse as a farm animal is limited by the restricted use of plows and other animal-drawn implements. Horse or mule carts are used in connection with construction and hauling operations. In the north, and to some extent elsewhere, oxen are used in the fields and the oxcart is important. There is some breeding of race horses for the tracks at Rio de Janeiro and São Paulo.

Modern poultry farms are encouraged by the Ministry of Agriculture. American specialists of the Institute of Inter-American Affairs have done valuable work in teaching better methods and introducing registered stock and incubators.

Opportunities in the poultry business may be opened in connection with the efforts of the Economic Research and Development Department of the Mogiana Railway to restore the productivity of old coffee estates in its zone of operations. The raising of poultry has been suggested as a suitable side line since it provides an additional source of income for tenants and is a source of fertilizer, supplying potash, phosphoric acid and other elements needed to restore the coffee lands. The Paulista Railway is also interested in providing new sources of activity along its lines.

Chapter 5

PROBLEMS OF FOOD

THE SECOND WORLD WAR, like the first, caused a severe food shortage in Brazil and gave rise to a good deal of concern over agricultural problems. Official studies indicate that food production has not kept pace with population increase, resulting in lower per capita consumption, but the conclusions are vitiated not only by the incompleteness of the data, but also by the inclusion of such items as coffee, which is primarily an export commodity. Everyone agrees that food production is inadequate, that yields have declined and that malnutrition is widespread, but there is less agreement as to the reasons and the remedies.

The increased tempo of urbanization and industrialization is frequently cited by Brazilians and foreigners alike as the devil in the piece. Undoubtedly it can be argued that certain types of industrialization have been pushed too rapidly, that too much protection has been given to industries that are making extremely high profits and that official policies should be redirected to give more assistance and encouragement to small and medium-sized farmers. In his message to Congress on March 15, 1948, President Dutra said: "Improvement of the standard of living depends, above all, upon the possibility of incrementing to a greater degree the production of consumer goods, especially foodstuffs, which urbanization and industrialization have perturbed, as everyone knows. I therefore urge favoring a greater production of consumer goods, particularly through reviving interest in agriculture." The President admitted that this was a work for generations, but held that it is possible now to give it impetus.

Appraisal of Difficulties

Corrective action, in order to be effective, must be based on a sound appraisal of the reasons for the present difficulties. Whatever the weaknesses of some of the present industrial structure, it would be a gross oversimplification to conclude that industrialization is the only or even the principal reason for the unsatisfactory state of food production. The roots of the trouble lie deep in the history of soil usage in Brazil, in the system of plantation economy specializing in export crops, in the evolution of transport, commerce and credit. The coffee boom of the 1920's and the cotton boom of the 1930's, for example, did more to divert land, resources and manpower from food crops than a thousand factories.

The shortage of farm labor induced by the decline of immigration, the drift to the cities, the growth of manufacturing and the institution of compulsory military training may have temporarily reduced farm output, but such events may also have some beneficial effects through forcing better treatment of labor, greater use of machinery, more attention to rural schools and community services, and encouragement of family farms. Already these effects are clearly visible in some of the more progressive states, notably São Paulo. Economically sound industries can also be of assistance by providing a larger market, at more remunerative prices, for agricultural products. Increased food production will not benefit the undernourished unless they have the money with which to buy.

Dispersion of Population

Permanent enlargement of food production in Brazil must be achieved, not by maintaining or increasing the number of inefficient farmers, but rather by having fewer and better farmers. The excessive dispersion of the population over a large area explains many of the economic and social problems. The frequently cited analogy with the "moving frontier" in the United States is partly valid, but it may be

misleading at times. In some respects the outlying zones of settlement resemble the situation in the United States around 1840, when Henry C. Carey completed his *Principles of Political Economy.* But in Brazil, in contrast to Ohio and the Middle West, soil and climatic deficiencies and the difficulties of transportation prevented the consolidation of the early frontier thrusts. In most sections of Brazil the caboclo is not a pioneer but a relict.[1]

Neither in the United States nor in Brazil has the overrapid opening up of new territories been altogether happy. The results in Brazil have been even more unfortunate, because this expansion has forced the excessive dispersal of inadequate resources over a vast area. During the colonial era deployment was hastened by the desire of the Portuguese Crown to hold the territory against the encroachment of other European powers. The search for gold and slaves and the adventurous spirit of the *bandeirantes* were other factors in opening up new territories. The "March to the West" of the Vargas era was partly inspired by international rivalries, which also influence the present pressure behind railway construction and settlement in southern Mato Grosso and other regions.

The present government rightly considers that the main task is to establish the quasi-nomadic squatters and farmers on a more permanent basis, but local demands and state rivalries make it difficult to concentrate available resources in the most effective manner.

Soil Conservation

The improvement of Brazilian agriculture has many facets, but the problem of conserving and rebuilding the soils of Brazil has many claims to priority. The present Minister of Agriculture, Daniel de Carvalho, has made it one of the cardinal points of his program. Speaking at Londrina, in

1. On this point see René Courtin, *Le Problème de la civilisation économique au Brésil,* Librairie de Medicis, Paris, 1941, pp. 95 and 184-91.

northern Paraná, a region opened to settlement less than two decades ago, the Minister stated that they were witnessing there the end of a cycle in Brazilian agriculture, the search for new lands for coffee plantations, the destruction of virgin forests by seminomadic farmers who left exhausted and eroded lands behind them. The task of the future, he said, was the conservation and restoration of their inheritance, a task that must be faced with the same courage, ingenuity and faith their ancestors showed in conquering a subcontinent.[2] The first Brazilian soil conservation congress was held at Rio de Janeiro in October 1947. Among the papers presented on that occasion were studies by the Instituto Agronômico de Campinas (São Paulo) and the Instituto de Pesquisas Agronômicas de Pernambuco, representing the two states that have done the most work on this problem.

The fine work now being done by many Brazilians in the field of soil conservation and farm management deserves notice. One example is the tomato-growing operations of Carlos de Britto e Cia., leading vegetable and fruit canners, at Pesqueira, state of Pernambuco, involving four thousand acres of their own land and fifteen thousand acres planted by others. The firm maintains laboratories, seed-testing beds and plots for experimentation with fertilizers and various methods of cultivation. The grandson of the founder, a graduate of the agricultural college in Pernambuco, has applied scientific knowledge to the handling of the undulating land in a region where heavy rains occur. Water runoffs are tested under varying conditions. The company has its own private water-supply catchment area.

Fertilizers

The use of fertilizers was increasing at the outbreak of the second world war. Imports in 1937-1939 averaged slightly

2. Address given in February 1948 on the occasion of the President's visit to the state of Paraná, text published in the *Diário Oficial*, Rio de Janeiro, February 17, 1948, p. 2092. Londrina, now a city of 30,000 people, was founded in 1932.

over 50,000 tons, declined during the war and reached 58,000 tons in 1946, chiefly Chilean nitrate and superphosphates. A Brazilian company operating apatite deposits at Ipanema and Jacupiranga (São Paulo) produced 10,420 tons of concentrate in 1946. Two new deposits of apatite were discovered in 1947, one near Araxá (Minas Gerais) and the other in the vicinity of Iguape on the coast of southern São Paulo. Preliminary reports on these deposits sound more encouraging than any previous discoveries.

Cottonseed meal, packing-house by-products and ammonium sulphate from Volta Redonda provide some commercial fertilizer materials.

In São Paulo fertilizer is used mainly for cotton and truck gardens. The intensive use of fertilizer was popularized by the Japanese vegetable growers. Coffee planters are turning to fertilizers in some areas.

The increased use of high-grade fertilizers in Pernambuco has been a factor in the larger sugar production of that state. Imports of nitrates from Chile and other chemical fertilizers from the United States, such as muriate of potash, superphosphate and potassium sulphates, are estimated at 15,000 metric tons a year. Apatite ore in powder form is obtained from São Paulo. The use of locally grown castorseed and cottonseed cake, as well as evaporated refuses from the distilleries, has increased.

Consideration has been given to the establishment of superphosphate plants at coastal points convenient to local raw materials as well as to imports of phosphate from North Africa.

The use of commercial fertilizer can, in any case, only touch the edges of the Brazilian agricultural problems. Even more important are the adoption of better agricultural practices for the control of erosion, reforestation, use of soil-building crops and the spread of mixed farming that will enable individual farmers to build up their soil without cash outlay.

Mechanization

Increased mechanization is often suggested as one means of obtaining greater yields. The nature of the crops and the terrain, as well as the low economic and cultural level of most of the rural population, have heretofore restricted the use of machinery. Some special types of plows are used to eliminate weeds on coffee estates, but their use is limited by the common practice of interplanting, the danger of damage to the trees and other circumstances. Most of the corn is grown by interplanting with other crops or on small plots by caboclos, who have neither the means nor the knowledge to employ implements. Most of the wheat is cultivated with the grub hoe, on rough terrain. Prospects of opening up new lands to mechanical cultivation have already been discussed. Tractors and tillage implements are used to a considerable extent in the cultivation of cotton, rice and sugar. During the 1943-1944 season, 58.6 per cent of the area planted to cotton in São Paulo was cultivated entirely by hand, 4.7 per cent was cultivated by machinery and 36.7 per cent was cultivated by a combination of the two methods. The custom of leaving stumps and logs in the fields restricts the use of machinery except on long-established farms.

A large part of the hand tools and plows is now manufactured in Brazil. In 1947 the demand for tractors and imported agricultural machinery was running ahead of the available supplies.

It has long been the custom of the Ministry of Agriculture to operate demonstration farms, some on government lands and some by cooperative arrangement with private owners whereby the Ministry provides the seeds, machinery and technical supervision. During the war the food supply division of the Institute of Inter-American Affairs, in cooperation with the Brazilian government, established units designed to aid both in the emergency food program and in the long-term improvement of agriculture and nutrition. Considerable amounts of agricultural equipment were

brought in, and rice and manioc mills were established in the north and the northeast. These agreements have been extended and training centers in the use of agricultural machinery established. Large American firms do some demonstrating of tractor farming. The state of São Paulo has ten junior agricultural schools at which the use of tractors is taught.

In 1947 the federal government imported agricultural machinery valued at $1.4 million, part of which was for resale and part for use in mobile farm units.

Storage and Marketing

The problem of storing and marketing food products is in some respects more serious than that of cultivation. A start toward provision of granaries was made during the war. In connection with its wheat-growing campaign the government is putting up storage facilities. It plans also to erect twenty-nine flour mills in Minas Gerais, Mato Grosso and the southern states. The most significant recent development was the announcement in April 1948 that Cargill, Inc., of Minneapolis had joined with Nelson Rockefeller's International Basic Economy Corporation to set up a company in Brazil to engage in the merchandising and processing of grain and related products.

The International Basic Economy Corporation has also launched several other projects that may well have far-reaching effects on agriculture in southern Brazil. These include production and distribution of hybrid corn seed, hog breeding and control of hog cholera, mechanized agricultural services for land clearance and cultivation, and insect control on a mechanized basis. For the time being activities will be concentrated in São Paulo and adjoining regions.

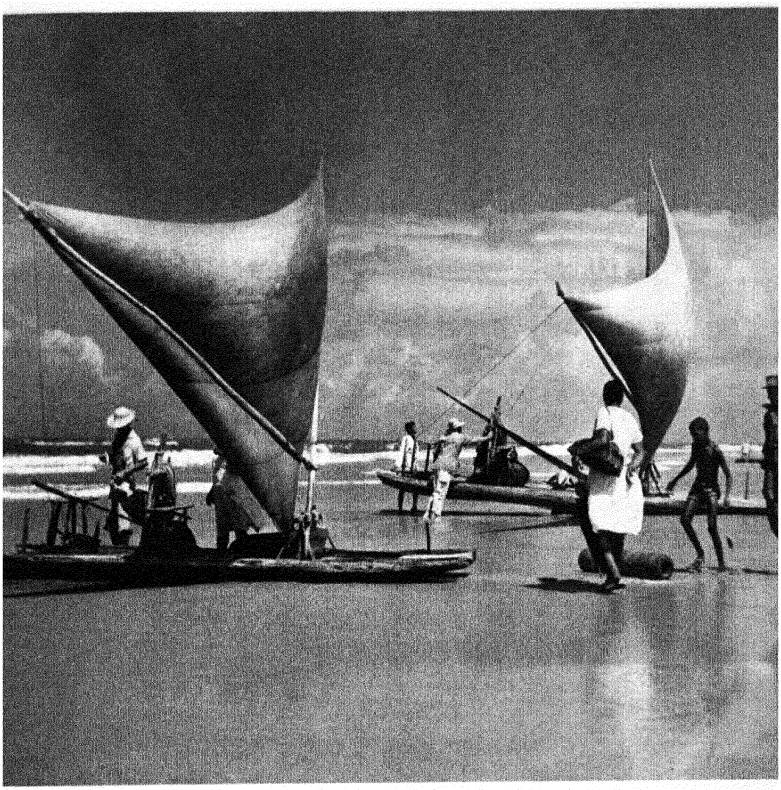
Diversification

In appraising the present position of agriculture one should keep in mind the progress in diversification during the

past three decades. A turning point in the agricultural history of Brazil came around 1907, at the time of the first great coffee crisis. The state of São Paulo, which was hardest hit by the crisis, took the lead in establishing a state department of agriculture and opening agricultural schools and research centers. The federal government followed suit, setting up a Ministry of Agriculture in 1909 and an agricultural and veterinary school in 1910. A number of foreign specialists, English, German, Swiss and American, were engaged to advise on particular crops. For example, a representative of the U. S. Department of Agriculture went to Brazil in 1913 to develop suitable cotton species. He opened a demonstration farm, and was made superintendent of a cotton bureau established in the Ministry of Agriculture. An American was also made director of the agricultural school opened at Piracicaba (São Paulo).

The collapse of the rubber boom and the advent of World War I gave further impetus to diversification. Before the war Brazil was a large importer of beans, rice, bacon, lard, butter and eggs as well as of wheat and deciduous fruits. During and since the war Brazil has been on an export basis with regard to some of these products. Preserved and refrigerated meats also became a regular article of export.

Interest in agricultural diversification and improvement continued in the interwar period. In 1921 Dr. P. H. Rolfs, dean of the agricultural college of the University of Florida, was chosen to head the proposed Escola Superior de Agricultura at Viçosa (Minas Gerais), which he built from the ground up. American specialists in livestock, fruit and entomology were engaged for the school staff and extension work. Both this college and the agricultural school established at Lavras (Minas Gerais) in 1908 by the Presbyterian Church of the United States had a wide influence. Brazilians trained in the United States played an important part in the groundwork that made possible the large expansion in production of cotton and citrus fruit during the 1930's.



INTREPID SEAMANSHIP is required to man these fishing boats at Recife, capital of the state of Pernambuco. Called *jangadas*, they are made of five small logs tied together, and in spite of their flimsy appearance they often venture miles out into the Atlantic in search of fish.

Research and Training

The federal agricultural schools, research activities and experiment stations have been reorganized in recent years. A decree of 1943 established a new center for agricultural teaching and investigation (Centro Nacional de Ensino e Pesquisas Agronômicas) to include a rural university, a vegetable oil institute, an institute for agricultural chemistry and headquarters for a number of regional institutes, as well as extensive acreage for plant experimentation and research.

This establishment is to be housed in fine new buildings erected at Kilometer 47 on the Rio–São Paulo highway. Although the center was officially inaugurated on July 4, 1947, only part of the activities have been moved out of Rio de Janeiro, since the professors and officials are reluctant to leave their homes and connections at the capital.

Research centers for north and south Brazil have been established at Belém and Pelotas, respectively, and centers or institutes for the west and east will eventually be opened. Each of these centers has supervision over the various experiment stations within its area.

Several of the states also have agricultural schools and research centers. In addition to its more advanced schools, the state of São Paulo has undertaken to provide a number of institutions where boys can be trained to become farm administrators. Three schools with an enrollment of about one thousand students have been started.

The Brazilian government has taken advantage of facilities provided by the United States for trainee grants to citizens of the American republics. In the agricultural field seventy trainees were admitted to training courses by the United States Department of Agriculture during the period from June 1944 to March 1948. Of these, forty-three studied extension work, ten soil conservation, thirteen agricultural economics and research, three rural electrification and one forestry. In addition, seventy-four Brazilian visitors in-

terested in agricultural matters were assisted during that period.[3]

Relationship to Other Problems

The agricultural problem is, of course, intimately related to policies in the fields of transportation, credit and immigration. The provision of a more adequate railway and highway net would do as much as any other one thing to improve the supply and reduce the prices of foodstuffs in the consumption centers. Something could be done to improve credit facilities and reduce interest rates on loans to small farmers. The agricultural and industrial credit branch (Carteira) of the Banco do Brasil was established in 1936 to provide a nucleus for a future specialized rural banking organization. It has provided very extensive credits to some types of producers, but speculators and large landowners have frequently been the principal beneficiaries. Credit facilities in the state of São Paulo have broadened during the last decade or so as the result of the competition of the Banco do Brasil, the São Paulo state bank and private banks. Operators of gins, oil mills and packing houses, as well as merchants, are important sources of crop credits. Manufacturers finance the production of raw materials needed in their factories. Cooperative societies have been successful in a few fields, principally in connection with immigrant groups like the Japanese, Germans and Italians. The Central Bank bill now before Congress provides for "rural banks."

The days of unrestricted immigration are past. Most of the tenants and farm hands will have to be recruited within the country. At the same time a wise immigration policy could aid materially in putting over programs of agricultural improvement. A colony of Dutch or other experienced farmers, for example, might make the difference between success or failure for the wheat promotion campaign. Consideration

3. Data provided by Ross E. Moore, Chief, Technical Collaboration Branch, Office of Foreign Agricultural Relations.

might be given to the possibility of combining a colonization project with a development corporation to be financed by foreign capital or an international institution.

Basically, the solution of the agricultural problem is the slow process of making better farmers. The first and most important step in this process is to make it possible for the farmers to earn a decent income. The second step is to provide better educational opportunities, especially training of the younger generation in better farming methods and provision of sufficient general education to enable them to improve themselves. It would be a mistake at this stage for the government to launch any large program of mechanization, although the maintenance of training centers in localities ready for that step may be warranted. Likewise, soil conservation and rebuilding must come about primarily through the efforts of individual farmers. The government can help most effectively through the adoption of policies that will encourage quasi-nomadic farmers to settle on plots of their own, and also make it worth while for them to cultivate the land properly.

Chapter 6

MINING AND POWER

MINING

ALTHOUGH BRAZIL was once the leading gold and diamond producing country in the world, its latent mineral wealth was long put in the shadow by the variety and value of agricultural production. Local consumption of mineral products was small, and exports were insignificant. The announcement in 1910, at the International Geological Congress at Stockholm, that Brazil possessed vast reserves of high-grade iron ore touched off several decades of rivalry and inspired many learned disquisitions, as well as a five-foot shelf of polemics, but it produced only minor quantities of iron ore.

The first world war, and even more the second global conflagration, focused attention on Brazil as the source of strategic minerals. Some of these—such as quartz crystals—are found only in Brazil; for others, Brazil is the chief source in the Western Hemisphere. Recently, geological investigations have shown that there are structures favorable to large pools of petroleum. Interest in mineral resources has also been quickened by the growth of local industries that are constantly seeking new sources of local raw materials and fuels.

The annual value of Brazilian mineral production at present is estimated at between $50 million and $60 million, of which coal accounts for more than one fourth. In recent years quartz crystals have been the second largest item, with gold and diamonds in third and fourth places, respectively. Manganese ore and mica each represent about 4 per cent of the total value of mineral production. A few items of chiefly

local consumption, such as lime, marble and mineral waters, comprise about 12 per cent.

The organized mining industry engages directly only a small number of persons, perhaps not more than 30,000, of whom half are in coal mining and one fourth in underground gold mines. In addition, there are about 100,000 Brazilians washing alluvial gravels for diamonds and gold.

Exports of mineral raw materials, including a few semi-manufactures, reached a peak of $41 million in 1943 (8.8 per cent of the total value of all exports), but declined to about $20 million in 1946.

Of the metallic minerals, gold continues to be the most valuable item. Production by underground mines in 1946 was 4.3 million grams, of which over 90 per cent was produced by the St. John del Rey Gold Mining Company, Ltd., a British company that has been active for one hundred and twenty-five years, now operating one of the deepest mines in the world at Morro Velho in the state of Minas Gerais. Other lode mines are at São Bento, Caeté and Passagem in Minas Gerais. Placer mining, which normally accounts for about 20 per cent of the total output, is most active in the northern and western states and in the territories of the Amazon basin. A small amount of silver results from the parting of gold bullion.

Vast Iron and Manganese Reserves

Manganese ore and iron ore are next in importance among the metals. Brazil is believed to have the largest reserves of high-grade iron ore in the world, and possibly also the largest deposits of manganese.

Mining of manganese ore began in 1894 at the Usina Wigg in Minas Gerais. In 1904 mining began at Morro da Mina, near Conselheiro Lafaiete (Minas Gerais), and has been continued up to the present time, although the peak of production has probably passed. The mine has been owned and operated since 1920 by Cia. Meridional de Mineração,

Ltda., a Brazilian subsidiary of the United States Steel Corporation. It is the principal producer and exporter of manganese ore. The only other producer for export at present is Cia. Minas da Bahia, which obtains the ore from mines near Santo Antônio de Jesus (Bahia).

Only a very small part of the total production of manganese ore is consumed in the country. A few hundred tons of ferromanganese are produced annually for use by the local steel industry.

In Minas Gerais the second largest manganese deposit of the state, adjoining the Morro da Mina, is now the property of the Cia. Siderúrgica Nacional. There is also a deposit at Saúde (Minas Gerais), twenty-nine miles southwest of Nova Era, which is the property of Ricardo Jafet of Mineração Geral do Brasil, Ltda. Other deposits are controlled by the St. John del Rey Gold Mining Company, Ltd., and the Cia. de Mineração de Ferro e Carvão, S. A.

According to reports, the Cia. Aços Especiais de Itabira at Acesita (Minas Gerais) has discovered manganese ore on its property, which formerly belonged to the Brazilian Iron and Steel Company and adjoins the mines of the Cia. Vale do Rio Doce.

A large body of manganese ore was recently discovered in the Amapá Territory one hundred and eighty miles north of the Amazon River. This deposit, which is controlled by the territorial government, has been leased for fifty years to the Sociedade Indústria e Comércio de Minério, Ltda. (Dr. A. Antunes). The development of transportation from this deposit to the Amazon River and the construction of port facilities there are likely to prove difficult and costly operations.

There are two manganese-producing districts in Bahia, one the Serra de Jacobina, five hundred kilometers northwest of the port of Salvador, and the second at Nazaré, fifty kilometers west of Salvador.

There is also the great Urucum deposit near Corumbá

(Mato Grosso), which is said to have reserves of 35 million tons. The concession for this is held by the Sociedade Brasileira de Mineração, Ltda. Since 1915, a total of 45,000 metric tons of this deposit have been mined. During World War II mining was carried on at the rate of about fifty tons a day. The ore was hauled twenty miles by truck to the Paraguay River, where it was dumped for subsequent loading on steamers and barges for shipment to Buenos Aires.

Corumbá is on the Paraguay River about two thousand miles above Buenos Aires and Montevideo. The river is navigable to Corumbá six months of the year for vessels drawing seven feet, and two additional months for boats drawing four and a half feet. An alternative route is via the Noroeste do Brasil Railway from Pôrto Esperança on the Paraguay River sixty miles below Corumbá. The rail distance from Pôrto Esperança to Santos is about twelve hundred miles.

Interest in Brazil's Iron Mountains

The exhaustion of the richer iron ores of the Mesabi Range in Minnesota has renewed the interest of United States steel companies in the reserve of other countries, including Brazil. Deposits in several regions of Brazil have been examined, but those of Minas Gerais have attracted the most attention. These are the only ones that have in the past been mined, or are today being mined, to an appreciable extent. From 700,000 to 850,000 tons of ore a year have been mined recently, chiefly for the use of domestic blast furnaces. Exports of iron ore, beginning on a substantial scale in the 1930's, reached a peak of 421,000 tons in 1942.

The hematite deposits of Minas Gerais are distributed over an area about one hundred miles long and sixty miles wide, east and south of Belo Horizonte, about two hundred and fifty miles in direct line from the ports of Rio de Janeiro, to the south, and Vitória, on the east. Heretofore, all shipments have gone out through one of these outlets, via the

Central Railway to Rio de Janeiro or the Vitória a Minas Railway to Vitória. Two other possibilities are being considered. One involves the construction of a nineteen-kilometer spur from a Central Railway branch line to the small port of Itacurussá between Rio de Janeiro and Angra dos Reis, thus avoiding the congestion in the port of Rio; the other calls for new ore-loading facilities at Aracruz (formerly Santa Cruz), about fifty miles north of Vitória, and a new railway from there to the Itabira iron region.

Wartime Developments

Prospects for future exports of iron ore must be considered against the background of two important wartime developments: the creation of the plant of the National Steel Company (Companhia Siderúrgica Nacional) at Volta Redonda, and the organization of the Companhia Vale do Rio Doce, S. A., to take over the control and operation of the Vitória a Minas Railway, the ore docks at the port and the ore deposits at Itabira which formerly belonged to the Itabira Iron Ore Company, Ltd.

Work was begun on the Volta Redonda plant in 1941 with United States financial and technical assistance. Since Volta Redonda is located in the Paraíba Valley, separated by the Serra do Mar from the coast, it is inconveniently located with reference to supplies of coal and to coastwise shipping. Earlier proposals had suggested the location of the plant at tidewater, where it would have been integrated with a large-scale operation involving outward movements of ore (and possibly pig iron as well) and return cargoes of coal.

The Rio Doce project was launched in 1942, with contributions from the British and American governments, which were anxious to expedite shipments of iron ore. Three operations were involved: the mechanization of the mining operation at the Cauê peak—the "iron mountain"—also involving crushing, screening and conveying to railway cars;

the improvement of the railway to enable it to handle 1.5 million tons annually; and the enlargement of ore-storing and ore-loading facilities at Vitória. Some improvements were made before progress was halted in 1947 for lack of funds. The Export-Import Bank of Washington declined to make disbursements on a new loan of $7.5 million pending action by the Brazilian government in providing new capital. Early in 1948 the capital of the Rio Doce Company was increased from 300 million to 650 million cruzeiros and the Brazilian Treasury was authorized to give the government's guarantee to the new loan of the Export-Import Bank. A new contract between the Brazilian government and the Export-Import Bank was signed on August 12, 1948. On October 7, 1948 the Rio Doce Company signed a contract with the Cia. Raymond-Morrison-Knudsen do Brasil for the construction work involved in the rehabilitation of those portions of the railway not already reconstructed or improved.

Getting Out Itabira Ore

About 173,000 tons of iron ore were shipped out of Vitória during 1947, and it is expected that 300,000 tons or more can be moved during 1948. Only hard lump hematite is shipped. This is in demand since it can replace scrap in the open-hearth furnace charge. Over the longer run, some doubt exists whether Brazilian ore can compete with other sources of ore, in view of the cost of the rail haulage as well as of a long ocean shipment. Ocean freights on the ore might be reduced to a nominal amount provided the ships that carry the ores could bring back coal. This plan, however, is contingent upon a volume movement of around five million tons a year, which would not be feasible without the construction of a deep-water port with adequate ore-loading and coal-unloading facilities, and also a new double-track, standard-gauge railway from the port to the mines. The entire operation is estimated to require an investment of $100 million. The plan is similar to the project prepared

VENEZUELA
COLOMBIA
PERU
BRASIL
GUIANA
(BRIT.)
(NETH.)
(FR.)
RIO BRANCO
Boa Vista
AMAPÁ
(TERR.)
Fe
Mn
Macapá
AMAZONAS
Manaus
PARÁ
Belém
São Luís
RIO GRANDE DO NORTE
Fortaleza
PARAÍBA
MARANHÃO
Teresina
CEARÁ
Mg
W
Ta-Be
Natal
João Pessoa
Recife
PIAUÍ
PERNAMBUCO
ALAGOAS
Maceió
ACRE
(TERR.)
Porto Velho
Rio Branco
GUAPORÉ
(TERR.)
Qtz
BAHIA
Aracaju
SERGIPE
Mn
Ita
Salvador
PERU
BOLIVIA
MATO GROSSO
Cuiabá
GOIÁS
Goiânia
Mg
GERAIS
Corumbá
Mn
MINAS
Qtz
Belo Horizonte
ESPÍRITO SANTO
P
Fe
Be
Fe
Pyrgos de Caldas
Fe
Au
Mica
Vitória
Mn
Al
RIO DEJANEIRO
PARAGUAY
SÃO PAULO
Al
PARANÁ
C
P
Niterói
RIO DE JANEIRO
C
Santos
São Paulo
C
Curitiba
SANTA CATARINA
Florianópolis
RIO GRANDE DO SUL
C
C
C
Porto Alegre
URUGUAY
CHILE
ARGENTINA
Al — BAUXITE
Au — GOLD
Ba — BARITE
C — COAL
Fe — IRON
Mg — MAGNESITE
Mica — MICA
Mn — MANGANESE
P — PHOSPHATES
Qtz — QUARTZ CRYSTAL
Ta Be — TANTALUM-BERYL
W — TUNGSTEN
1000 MILES
TRM

NOTES ON MINERAL AREAS

Minas Gerais is still the principal mining state in Brazil, as it has been since colonial times. It is by far the principal producer of gold, iron ore, manganese, limestone, bauxite, silver, zirconium, arsenic and semiprecious gems, also an important source of mica, quartz crystals, diamonds and various minor minerals. The adjacent state of Bahia, historically an important center for alluvial gold and diamond operations, has more recently produced carbonadoes, mica, quartz crystals, manganese, chromite, monazite, barite and asbestos.

Goiás, adjoining Minas Gerais on the west, yields nickel, chromite, mica, quartz, diamonds, cobalt and rutile. Mato Grosso, long famous for its gold, is a leading diamond-producing state and an important source of quartz. Its deposits of iron ore and manganese are receiving attention.

Coal is the most valuable mineral mined in the southern states. Rio Grande do Sul produces tungsten (wolframite) as well and has some copper; Paraná yields gold and diamonds; Rio de Janeiro State, limestone; and São Paulo State, gold, lead, limestone, apatite and scheelite.

During World War II a new mining district was opened in the northeast: tin (cassiterite), beryllium and scheelite in Paraíba and Rio Grande do Norte, and rutile in Ceará. New gold discoveries have been made in Maranhão. There are alluvial gold workings in Pará and in the territories of Amapá, Rio Branco and Guaporé. Deposits of iron ore, manganese and other minerals have been discovered in Amapá.

Large areas in Brazil of geologic formations favorable to mineral occurrences have never been adequately explored. In some regions exploitation is held back by inadequate transportation. Exploitation of bulk minerals requiring some power equipment and rail or water transportation came only during the present century. The first world war gave an impetus to the development of manganese, iron ore, coal and chromite, as well as of mica and other light minerals that are mined and transported in a primitive fashion. During the second world war other minerals were mined and more advanced equipment introduced.

in the 1920's. At that time a new railway route from Aracruz to Itabira was surveyed by an engineer named Russell.

The project is an attractive one, but there are difficulties other than the question whether private interests would be willing to invest $100 million except under conditions of operation and control that the Brazilian government would have difficulty in accepting. It is not clear that Brazil could use all of the five million tons of coal to be brought back by the ore ships. Furthermore, payment for the coal presents an exchange problem, since, at present prices, coal costs ton for ton several times the selling price of iron ore.

Another aspect of the problem relates to the character of the available ores, which consist of three principal grades: hard hematite, with an iron content of 65 to 68 per cent and with phosphorus content not to exceed 0.02 per cent; a flaky uncemented hematite called jacutinga; and a surface formation of hard cobbles and fragments of hematite cemented in a matrix of limonite known as *canga.*

Up to now the iron ore reserves in Minas Gerais have been so large in relation to the existing scale of operations that there has been little occasion for careful field exploration to determine the exact amounts and types of ores available. In 1947 representatives of the United States Geological Survey, in cooperation with Brazilian officials, began a program of more detailed investigations.

Ore vs. Pig Iron

The properties of the Rio Doce Company comprise three deposits known as Cauê, Conceição and Dois Córregos. Cauê, the only deposit now being worked, is estimated to contain 100 million tons of hard hematite of 65 per cent Fe or better and an additional 335 million tons of other ores about 50 per cent Fe. On the basis of these estimates, for each ton of high-grade lump ore shipped, there would be at least three tons of soft ore that must be mined and discarded, unless facilities could be provided for sintering this soft ore

and smelting it near the mine. Thus, for each ton of hard ore, one and a half tons of pig iron would be available for shipment. Since pig iron is worth $40 a ton as compared with $6 to $9 for ore, it could more readily support the freight charges. The smelting would be done with coal brought back by the ore ships, or through the adaptation of new technological processes.

Aside from the iron ore of Minas Gerais, there are important deposits in other states. Hematite is also found in Mato Grosso, Goiás, Paraná (with subordinate magnetite), Ceará, Bahia and the territory of Amapá. Magnetite ores occur in the three southern states.

In Paraná a small blast furnace was erected near Antonina in 1938 to smelt the magnetite ore of that area. The more important deposits in Bahia are in the São Francisco, Contas and Paraguaçu basins. The hematite ores of Amapá were discovered in 1941. An American company that held an exploratory concession made extensive tests, but is understood to have concluded that the available ores of shipping grade would not warrant the required investment in mines, power, railway and dock facilities on the Amazon River. Mato Grosso has fairly large reserves of relatively pure hematite, the principal deposits being near Urucum in the district of Corumbá, near the manganese deposits.

Steel Industry Expanding

There are now twenty-eight charcoal blast furnaces in Brazil, with an annual production of about 280,000 metric tons. Volta Redonda, the only coke-using plant, has an estimated 300,000-ton capacity but has not yet succeeded in attaining that rate.

Small quantities of charcoal iron have been made for many years, but the industry got its real start in 1921 with the formation of the Belgo-Mineira Company by the Arbed Belgo-Luxemburg interests. This company bought out and enlarged a small plant at Sabará (Minas Gerais). In 1935 it

inaugurated a large new plant at Monlevade, farther east on the Central Railway narrow-gauge line that connects with the Vitória a Minas line at Itabira, and thus provides access to large forest reserves owned by the company in the Rio Doce Valley. In 1948 this company initiated operations in its Swedish-type sintering plant to utilize fine charcoal and soft iron ore. A second unit has been ordered. With these installations, the Belgo-Mineira Company will be able to use the oven or retort method of producing charcoal and thus obtain the by-products which have heretofore been lost.

Most of the charcoal furnaces are in Minas Gerais, but there are several in the states of Rio de Janeiro and São Paulo, one at Vitória, one in Paraná and one at Corumbá (Mato Grosso). The two largest producers of charcoal iron ore are also the leading manufacturers of steel products, after Volta Redonda.

In 1946 Brazil produced a total of 369,000 metric tons of pig iron, 344,000 tons of steel ingots and 232,000 tons of mill products. Volta Redonda, which began operations that year, produced during the months it was in operation 96,000 tons of pig iron, 85,000 tons of steel billets and ingots and 13,000 tons of products. In 1947 Volta Redonda production was 98,000 tons of pig iron, 76,000 tons of ingots and 71,000 tons of rolled products. Total Brazilian production in 1947 was 481,000 tons of pig iron, 388,000 tons of steel and 316,000 tons of rolled products.

Despite the increase in the quantity and variety of Brazilian iron and steel production, imports in recent years have been well above the prewar average and would have been larger had the supplying countries been able to meet the demand.

Minor Metals

Mining of the major nonferrous metals other than manganese has never been important in Brazil. Production of copper, lead and tin is very small, and of zinc practically nil. During periods of high prices, as in wartime, Brazil exports

TABLE 8

EXPORTS OF METALLIC ORES AND METALS (EXCEPT PRECIOUS AND FERROUS METALS), SELECTED YEARS

Ore or Metal	Amount			Value		
	1938	Peak War Year	1946	1938	Peak War Year (On Volume Basis)	1946
	(*In Metric Tons*)			(*In Thousands of Dollars*)[a]		
Manganese ore	136,843	437,402 (1941)	149,149	946	4,019	1,991
Tungsten ore	2	2,038 (1945)	1,476	—	1,678	1,237
Titanium ores						
Rutile	376	4,615 (1942)	28	37	455	2
Ilmenite	155	5,000 (1945)	—	1.5	44	—
Chromite	934	7,813 (1943)	—	8.4	103	23
Bauxite	12,928	76,761 (1943)	1,161	144	605	11
Beryllium ore	203	2,027 (1943)	1,163	6	108	120
Tantalite	38	201 (1944)	44	32	629	194
Zirconium ores	7,492	17,114 (1942)	4,453	57	411	121
Monazite	324	1,550 (1943)	1,250	4	65	62

Source: Based on official sources.

a. Converted at the rate of $.0580 and $.0538 per cruzeiro for 1938 and 1946 respectively and $.05 for the peak war years.

substantial amounts of tungsten ores. Tungsten is mined as wolframite in the states of São Paulo and Rio Grande do Sul, and as scheelite in Paraíba and Rio Grande do Norte. Production of a number of other metals of minor commercial significance but high strategic value achieved some importance during the war, but demand for most of them—beryllium is the principal exception—has declined since the end of hostilities. The volume and value of exports of metallic ores and metals, excepting precious and ferrous metals, is given in Table 8.

Quartz, Mica, Gems

The nonmetallic minerals are of special importance in Brazil (see Table 9 for volume and value of exports). Quartz crystals were of prime importance during the war and immediate prewar years, but diamonds have subsequently

TABLE 9

EXPORTS OF NONMETALLIC MINERALS, SELECTED YEARS

Mineral	Amount				Value		
	Unit	1938	Peak War Year	1946	1938	Peak War Year (On Volume Basis)	1946
					(*In Thousands of Dollars*)[a]		
Quartz	metric tons	747	2,411 (1943)	170	869	16,236	2,260
Mica	" "	521	984 (1945)	1,148	298	2,157	1,453
Graphite	" "	—	198 (1944)	92	—	50	12
Diamonds	grams	91,140	64,309 (1941)	25,292	735	7,396	6,725
Carbonadoes	"	5,119	4,309 (1941)	2,814	30	199	245
Semiprecious stones							
Aquamarines	"	301,988	1,169,034 (1940)	93,693	130	673	592
Amethysts	"	2,045,037	149,283 (1945)	318,478	9	392	589
Garnets	"	3	80,354 (1945)	53,023	—	255	145
Topaz	"	2	135,464 (1945)	18,880	—	71	47
Tourmaline	"	30,527	130,017 (1940)	10,543	16	64	66
Citrine	"	—	200,501 (1943)	183,308	—	375	244
Not specified	"	241,707	1,279,381 (1941)	—	44	130	—

Source: Based on official sources.

a. Converted at the rate of $.0580 and $.0538 per cruzeiro for 1938 and 1946 respectively and $.05 for the peak war years.

taken first place among the exports of this group. Both the postwar demand and the supply of mica have held up better than was anticipated. A diamond-cutting industry was established in Brazil during the war by European refugees. Exports of semiprecious stones have increased.

Carbonadoes are produced chiefly around the upper reaches of the Paraguaçu River in Bahia. An important source of barite has been developed on Camamu Island, in the state of Bahia; production in 1946 was about ten thousand tons. Barite is exported to the Caribbean for use in petroleum-drilling operations. Asbestos is found in many localities in Brazil but is mined only in the state of Bahia, near Jiquié. The output ranges around a ton and a half a day. It is used in Brazil for the manufacture of asbestos-cement products like pipe and roofing sheets.

Mining Outlook Brighter

The outlook for the mining industry has improved in recent years, but a number of problems remain unsolved. Among the favorable factors are the demand for strategic minerals and the declining reserves of certain minerals in the United States. On the other hand, further development is retarded by inadequate transportation and power, restrictions arising in connection with exchange control, high local costs and reluctance to make adequate capital expenditures pending the completion of new mining legislation.

In accordance with the changes introduced by the 1946 Constitution, the Brazilian government has authorized the formation and operation of Brazilian companies organized by Canadian and United States mining concerns. A new mining code has been drafted under the direction of the Mining Department (Departamento Nacional da Produção Mineral), but the text has not yet been published or submitted officially to the Congress.

The fact that foreign-owned mining companies were permitted to continue operations even at the height of the

nationalistic period, together with the changes introduced by the 1946 Constitution and the action of the present government in granting charters to several subsidiaries of foreign companies, gives encouraging indication that foreign participation in the development of Brazil's mineral resources is desired. The facilities granted during the war to large-scale participation by United States agencies in developing supplies of strategic minerals is another favorable sign.

At the same time it must be recognized that Brazil's present attitude is more favorable to development of resources for domestic use than for export. Perhaps Brazilian public and official opinion does not always recognize that the two objectives are not necessarily contradictory, that investments made to develop new exports or expand old exports may increase the supply and reduce the cost to domestic consumers. In a country with a chronic shortage of labor, efforts to hamper exports in other than processed form are apt to be uneconomic and unwise from the standpoint of the long-run interests of the country.

All mineral exportation is subject to official license. Exporters are required to buy 120-day Treasury bills up to 20 per cent of the assessed valuation of exports, and must turn over to the exchange authorities the dollar value of the shipments.

Taxes and Labor Costs

The present mining code (Article 68, as amended by Decree-Law No. 5247 of February 12, 1943) provides that the total taxes by the federal, state and municipal governments on a mining operation shall amount to a total of 8 per cent of the value of the mine production. The income tax, however, is additional, except on gold mining, and so is the special tax on profits remitted abroad. The 8 per cent tax is collected by the federal government on the value "at the mouth of the mine," the assessed value being established annually. This tax is in the nature of a royalty that must be paid regardless of the profitability of the enterprise.

Underground workmen receive 25 per cent extra pay for all time worked over six hours a day. In the small mines two nine-hour shifts are usually worked, involving payment for three hours daily at overtime rates. The wage scale for a small mine in central Minas Gerais at the end of 1946 was as follows:

Underground machine man: Cr. 2.50 an hour for six hours plus 25% for remaining three hours; pay per shift, Cr. 15.00 plus Cr. 9.30; total Cr. 24.30, or about U.S. $1.25.

Ordinary workman, underground: Cr. 1.70 an hour for six hours, plus 25% for remaining three hours; pay per shift, Cr. 10.20 plus Cr. 6.40; total Cr. 16.60, or U.S. $.80 to U.S. $.85.

A shift boss receives Cr. 900 a month; a mine captain, Cr. 900 to 2,000; a chemist, Cr. 2,500; and a mining engineer, Cr. 3,500 to 4,000 a month.

Social security payments for 200 men amount to about 20,000 to 30,000 cruzeiros a year.

Potential Mineral Resources

The geology of Brazil is still imperfectly known, but on the basis of available information, the mineral resources of Brazil are classified by specialists in the following three categories from the standpoint of potential productivity: [1]

A. Abundant; adequate for domestic needs independent of foreign sources

Note: Of the thirty-four items below, the fourteen marked (e) are regularly exported from Brazil. Actually, some items on the list are imported at present, notably phosphate, gold, marble and tungsten compounds. Some of the items in this category have had only a small development because of the limited local industrial use. Additional discoveries appear likely in the future.

iron (e)	tantalite and columbite (e)
manganese (e)	mica—all grades (e)

1. The writer is indebted for this classification to Emerson Brown, Minerals Attaché of the United States Embassy at Rio de Janeiro.

tungsten (e)	quartz crystal (e)
bauxite (e)	gold
magnesite	gem diamonds (e)
zirconium (e)	carbonadoes (e)
beryllium (e)	gypsum
chromite (e)	diatomaceous earth
kaolin and feldspar	peat
talc	nickel ore
marble	glass sand
monazite	building stone
limestone and dolomite	clay and ochre
cobalt	semiprecious stones (e)
barite (e)	titanium
graphite	salt
phosphate	lithium

B. Natural resources probably inadequate for domestic requirements and hence must be imported (eventual development of adequate sources of lead, zinc, silver, arsenic and petroleum is possible)

coal	tin	slate
petroleum	diamond bort	potash
lead	asbestos (chrysotile)	copper
abrasive garnet	corundum	zinc
silver	pyrite (see sulphur)	bismuth
kyanite	fluorspar	antimony
	arsenic	

C. Inadequate; resources unknown at present in economic quantity or quality

platinum	nitrates
molybdenum	helium
cadmium	sulphur
vanadium	mercury
	uranium

Fuel and Power

The provision of adequate sources of fuel and power is recognized as one of the key problems in Brazil today. The improvement of transportation, food supply and industrial production is in large measure dependent upon regular and adequate supplies of fuel and power. War-created shortages of foreign supplies of fuel and of generating equipment

have heightened public consciousness of the subject. Imports of fuel are a major drain on exchange reserves, averaging about $33 million annually from 1940 through 1945 and reaching a maximum of $99 million in 1947 (not including lubricants).

The per capita output of mechanical energy is very low in Brazil. Owing to the predominantly tropical climate, very few houses are heated. In agriculture, mining, manufacturing and transport of goods, a large part of the work is performed by human muscles, aided to a limited extent by animal power. Even in southern Brazil, the economically most advanced area, the traveler on the highways passes more animal-drawn vehicles than motor cars, while in the rural areas of the north, wheeled vehicles of any kind are rare, humans sharing with donkeys, mules and oxen the burden of moving produce to market. Donkey carts play a larger role in the construction of railways and highways than earth-moving machinery.

The percentages of the various sources of inanimate energy in Brazil have been estimated by S. Fróis Abreu, a leading specialist in this field, as follows:

	Per Cent
Wood and charcoal	84.0
Coal	8.7
Imported	5.0
Domestic	3.7
Petroleum	5.9
Hydroelectric energy	1.3
Alcohol	0.1
	100.0

Wood is extensively used as fuel by railways and shipping and by public utility and private power plants. Charcoal is widely used for cooking and in blast furnaces and poor-gas engines. The growing scarcity and cost of fuel, as well as

the damage from erosion following the devastation of the forests, present a serious problem. Some of the railways have undertaken reforestation programs along their lines. Iron and steel works and a pulp and paper mill are also planting trees.

Coal of Low Grade

Although some coal, lignite or peat is found in many parts of Brazil, the principal coal deposits are in the south. Coal-bearing strata outcrop in a narrow band extending from the southern part of São Paulo to the Uruguayan border. Beds of pure coal of exploitable thickness have never been found in Brazil. Some fairly pure coal is found in every bed, but it is interstratified and ingrained with bituminous shale or slate.

Before the first world war, the São Jerônimo mine in Rio Grande do Sul was the only one worked on a commercial scale. Production in 1913 was about 15,000 tons. The fuel shortage during the first world war moved the government to take steps to develop local resources, even though of inferior quality. The coal-mining companies have been aided by loans, by exemption from certain taxes and import duties and by protective duties on imported coal. The railways were also given financial assistance to enable them to install special grates suitable for local coal. In 1931 all coal importers were required to take a specified percentage of national coal for each ton imported. Thereafter coal production increased rapidly, reaching the one-million-ton mark in 1939 and the two-million-ton mark in 1943. It appears doubtful whether production can profitably be expanded much beyond this level.

Coal imports averaged about 1.3 million tons before 1940, but declined during the war owing to the international shortage. Imports in 1946 amounted to slightly over one million tons of coal and 23,000 tons of coke, valued at more than $18 million. The calorific value of the imported coal is,

however, 60 per cent higher than the domestic coal. In 1947 imports rose to about 1.6 million tons; domestic production was slightly over 2 million tons.

The biggest development in recent years has been the increased output in Santa Catarina of a quality suitable for coking after concentration by washing. The National Steel Company has developed its own mines in Santa Catarina and installed a washing plant at Tubarão, from which point the coal is shipped to the company's coke plant at Volta Redonda.

There are also substantial coal reserves in Paraná and small reserves in São Paulo. Most of the Paraná production is used by the Paraná–Santa Catarina Railway and by the Sorocabana Railway. Production has been limited by the inability of the railways to move more coal.

The coal mines are partly mechanized, but with one or two exceptions labor is not used effectively. The captive mine of the National Steel Company is considered by specialists as the most efficiently operated. During the war and since, several United States experts have been loaned to Brazil to advise on various phases of coal-mining operations. Dr. John E. Good, of the United States Bureau of Mines, has prepared a comprehensive report on the Brazilian mines after a protracted stay in the coal fields.

The principal Brazilian ports are inadequately provided with coal-unloading facilities.

Discovery of Petroleum

Active interest in petroleum possibilities in Brazil is of recent origin, but oil is now one of the headline questions of the day.

Shortages during World War I aroused some private and official interest, as in the case of coal. Between 1918 and 1938 the geological and mineralogical service of the Ministry of Agriculture drilled over seventy wells in a number of states. Some geological work was done by foreigners and Brazilians. Official interest in petroleum increased during

the 1930's. The activities of the Department of Mineral Production, guided by the studies carried out during the nineteenth century by American geologists (who also revealed the coal and iron ore resources), were rewarded in 1939 by a well producing a few quarts of petroleum daily. This well, located in the suburbs of the capital of the state of Bahia, is in what is known as the Lobato-Joanes field. Four other fields, Candeias, Aratu, Itaparica and Dom João, all situated on the Bay of Todos os Santos, have since been discovered.

The National Petroleum Council, created in 1938 by the decree-law establishing a government petroleum monopoly, took over the drilling campaign a few months after the Lobato discovery well was brought in. Up to the end of 1946 a total of about one hundred wells had been drilled in Bahia. About 276,000 barrels of oil had been obtained from the producing wells. The wells have a daily capacity of several thousand barrels, but actual production is held down owing to the lack of refining capacity.

Growth of Refineries

During the war the Petroleum Council installed two rudimentary refineries at Aratu and Candeias, each with a daily capacity of 150 barrels of crude oil. The Candeias refinery was later dismantled. The organization of a mixed company, Refinaria Nacional de Petróleo, S. A., to construct a new refinery in Bahia was authorized by Decree-Law No. 9881 of September 16, 1946. The capital was set at 50 million cruzeiros, half to be subscribed by the federal Treasury and half of the subscription by private Brazilians. An appropriation of 25 million cruzeiros for this purpose was granted by Law No. 120 of October 22, 1947. It was announced in October 1947 that one contract had been signed with the M. W. Kellogg Company to plan the project and supply the material, and a second contract with the Kellogg Pan American Corporation, subsidiary of the former, for the

construction of the refinery, which is to have a daily capacity of 2,500 barrels.

Three small privately owned refineries in the southern states operate on imported crude. The refinery of Ipiranga, S. A., at Rio Grande, state of Rio Grande do Sul, with a capacity of 1,500 barrels daily, has been operating with royalty oil purchased from the Venezuelan government.

A pilot plant producing oil from shale was inaugurated in 1947.

The proven reserves in the Recôncavo area of Bahia are placed at about 30 million barrels. Brazilian imports of petroleum and petroleum products run about 15 million barrels annually.

A number of wells producing natural gas were drilled in the Aratu and Itaparica fields. The Petroleum Council has announced its intention to begin marketing natural gas during 1948.

In an effort to reduce Brazil's dependence upon imported liquid fuel, importers of gasoline have been required since 1931 to purchase alcohol and mix it with motor fuel sold to the public. The Sugar and Alcohol Institute is authorized to fix the percentage in accordance with the available supplies of alcohol and gasoline. During the war as much as 75 per cent alcohol was used in the mixture. At the beginning of 1948 the proportion was 20 per cent in areas where the institute maintained ample stocks. A number of large alcohol distilleries were erected during the late 1930's and the early war years. Alcohol production later declined as petroleum supplies improved and the price of sugar turned more favorable.

The Petroleum Council has utilized the services of a number of American geologists and of several geophysical and drilling organizations. American firms were also engaged to advise on the construction of a refinery and to study the project for a pipeline from Santos to São Paulo. On advice of a Dallas, Texas, firm, geological reconnaissance

studies and geological surveys of structures are being continued in the sedimentary basin north of Salvador. The program of geological and geophysical studies also embraces the following regions which are considered promising:

1. Sedimentary coastal belt running from the state of Espírito Santo to Rio Grande do Norte
2. Maranhão-Piauí basin
3. Mouth of the Amazon River and basin of the lower and middle Amazon
4. Amazonas-Acre area
5. Paraná basin
6. Upper Araguaia basin

New Petroleum Law Debated

Policy regarding petroleum development has come in for animated discussion during recent years. The draft of a new petroleum code was prepared by a committee under the chairmanship of Odilon Braga, a member of Congress and former Minister of Agriculture. The subject has also received the attention of the National Security Council, the Army General Staff, a special Cabinet committee and an investment commission under the chairmanship of Daniel de Carvalho, present Minister of Agriculture.

Three main points of view have emerged from the discussions in Congress, the press and public forums. One group would maintain a government monopoly with the objective of supplying Brazil's needs without promotion of exports. General J. C. Horta Barbosa, the first president of the Petroleum Council, has been one of the most outspoken champions of this view. Another group favors opening all phases of the petroleum industry to competitive private enterprise without distinction as to nationality. The third group is opposed to a government monopoly and would admit foreign capital in the exploration and production of oil and also in its exportation, once Brazilian needs are satisfied, but would reserve refining and specialized transportation to companies

having at least 60 per cent Brazilian ownership and voting control.

This third point of view is embodied in the draft petroleum law prepared by the commission under the chairmanship of Odilon Braga, and submitted to Congress by President Dutra, according to the text as published in the *Jornal do Commercio* under date of February 24, 1948. It declares that petroleum deposits are "reserved as inalienable and imprescriptible property of the private domain of the union." The exploration and exploitation of deposits, as well as refining and transportation of petroleum, national or imported, are declared to be a public utility. The federal government shall carry out these operations and regulate the commerce of petroleum and its derivatives, either by direct administration or by means of authorizations or concessions.

Surface land owners, who by this law are prevented from exercising the preference referred to in paragraph 1 of Article 153 of the Constitution, shall be indemnified at their option either (a) by the payment at the time exploitation is begun of an amount equivalent to the average value, during the last five years, of the lands, or (b) by the payment of an annual contribution equal to one per cent of the value of production at well head.

Reconnaissance to select exploration zones, exploration, short-term exploitation of small deposits and the exportation of petroleum and derivatives are subject to authorization.

The following are subject to individual or integrated concession:

(a) Long-term exploitation of deposits of large size
(b) The transportation of fluid hydrocarbons by means of pipelines or tankers in internal or coastwise navigation lines
(c) The refining of national or imported petroleum

Authorizations and concessions may only be granted to (a) Brazilian citizens, (b) companies organized for such

purposes in Brazil or (c) corporate agencies of the federal, state or municipal governments.

Concessions for transporting or refining petroleum for domestic consumption may have as titleholders only (a) corporate agencies of the government, (b) mixed companies, (c) partnerships or limited liability companies of which all members are Brazilians or (d) share companies in which at least 60 per cent of the shares belong to Brazilians.

The period of a concession shall not exceed forty years. The normal period of an exploitation concession shall be thirty years.

In addition to the contribution to the landowner, the concessionaire is subject to payments ranging from 10 to 14 per cent, depending on the zone.

Exportation is subject to special authorization. The National Petroleum Council shall set export quotas to assure a supply of crude for refining sufficient for the domestic market and to permit the export of refined products in increasing proportions. When the demands of internal consumption, plus reserves, are satisfied, exportation will be unrestricted.

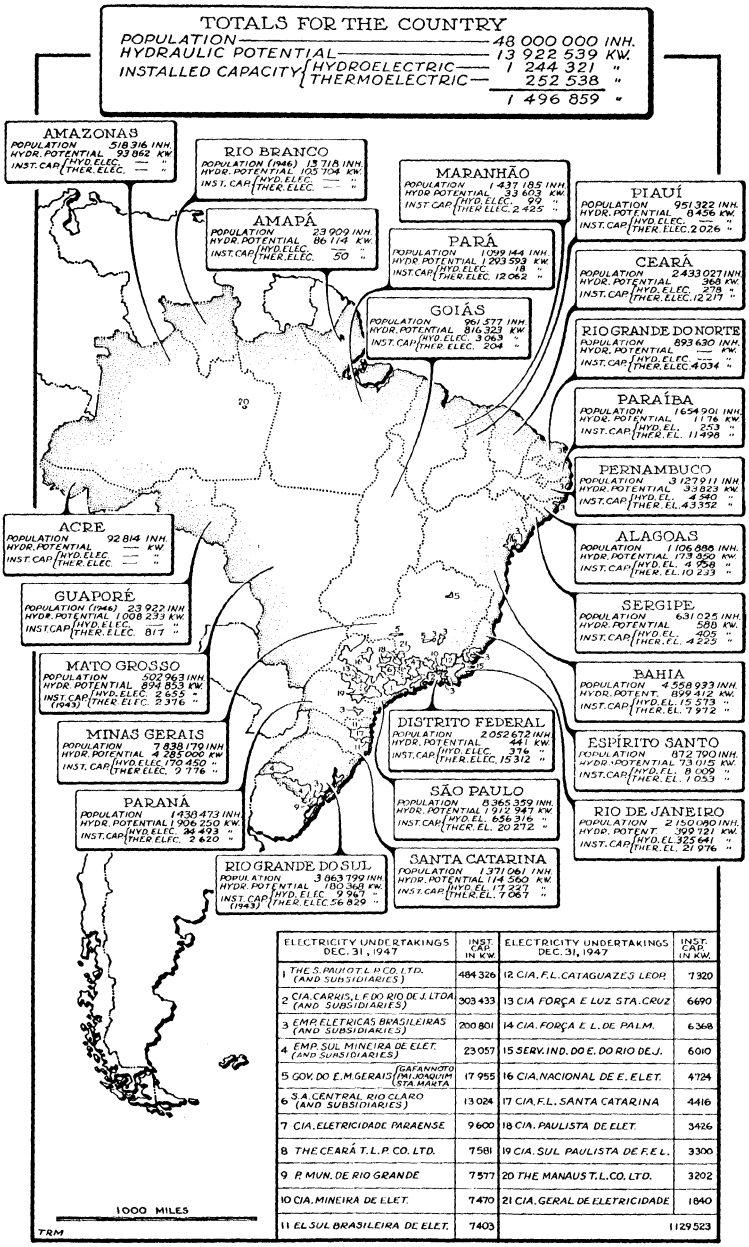
Provision is made for a national petroleum fund, to be used to pay for direct exploration operations by the National Petroleum Council, the payment of indemnities for redemption and the construction of pipelines and refineries necessary for national security.

Water-Power Potential

Brazil ranks high among the nations of the world (after Russia, the United States and Canada) in water-power potential, but far down the list in per capita consumption of electric power.

Water-power resources are estimated at 19.5 million horsepower (14.4 million kw.), distributed by hydrographic basins as follows: Paraná, 49.8 per cent; Amazon, 22.5 per cent; São Francisco, 8 per cent; Uruguay, 1 per cent; Paraguay, 0.5 per cent; rivers of the eastern states, 13.8 per cent; southeastern rivers, 3.9 per cent; northeastern states, 0.5 per cent.

ELECTRIC NETWORKS



ELECTRICITY UNDERTAKINGS DEC. 31, 1947	INST. CAP. IN KW.	ELECTRICITY UNDERTAKINGS DEC. 31, 1947	INST. CAP. IN KW.
1 THE S. PAULO T. L. P. CO. LTD. (AND SUBSIDIARIES)	484 326	12 CIA. F. L. CATAGUAZES LEOP.	7 320
2 CIA. CARRIS, L. E. DO RIO DE J. LTDA (AND SUBSIDIARIES)	303 433	13 CIA FORÇA E LUZ STA. CRUZ	6690
3 EMP. ELETRICAS BRASILEIRAS (AND SUBSIDIARIES)	200 801	14 CIA. FORÇA E. L. DE PALM.	6368
4 EMP. SUL MINEIRA DE ELET. (AND SUBSIDIARIES)	23 057	15 SERV. IND. DO E. DO RIO DE J.	6010
5 GOV. DO E. M. GERAIS	(GAFANHOTO (MJ. ANQUIM (STA. MARTA	17 955	16 CIA. NACIONAL DE E. ELET.	4724
6 S. A. CENTRAL RIO CLARO (AND SUBSIDIARIES)	13 024	17 CIA. F. L. SANTA CATARINA	4416
7 CIA. ELETRICIDADE PRAENSE	9 600	18 CIA. PAULISTA DE ELET.	3426
8 THE CEARÁ T. L. P. CO. LTD.	7581	19 CIA. SUL PAULISTA DE F. E. L.	3300
9 P. MUN. DE RIO GRANDE	7577	20 THE MANAUS T. L. CO. LTD.	3202
10 CIA. MINEIRA DE ELET.	7470	21 CIA. GERAL DE ELETRICIDADE	1840
11 EL. SUL BRASILEIRA DE ELET.	7403		1129523

Installed hydroelectric capacity in 1943 was 1,064,000 kw., and in addition there was installed thermoelectric capacity of 235,000 kw., making a total of 1,299,000 kw. By the end of 1947 the total installed capacity had increased to 1,497,000 kw.

The state of São Paulo has half of the hydroelectric capacity. The three states São Paulo, Rio de Janeiro and Minas Gerais have 92 per cent of the total for the country. Paraná, Santa Catarina and Bahia follow at considerable distance after these three leaders. In thermoelectric power Rio Grande do Sul leads, followed by Pernambuco, Rio de Janeiro and São Paulo.

Expansion of Large Utilities

Two large enterprises, the Brazilian Traction, Light and Power Company, Ltd., of Toronto, Canada, and subsidiaries of the American and Foreign Power Company of New York, generate and distribute about 75 per cent of the total power produced in Brazil. The former concern, known in Brazil as the "Light," through its operating companies furnishes light, power, traction and gas to the cities of Rio de Janeiro, São Paulo and Santos, as well as light and power to many smaller communities. It also provides telephone service in that area. This one organization produces and distributes over 60 per cent of the total power produced in Brazil and supplies approximately 75 per cent of the telephones in service in Brazil.

Work now in progress will further increase the generating capacity of its companies by 700,000 kw., at a cost of $200 million over five years. On November 16, 1948 President Dutra signed a law guaranteeing a loan to the "Light" from the International Bank in an amount not to exceed $90 million.

One of the great power installations of the world has been developed by Brazilian Traction, Light and Power Company in the Serra do Mar between Santos and São Paulo. A reser-

voir located at the crest of the escarpment is supplied by the heavy rainfall and by water pumped from the swampy rivers and lakes that originally drained through the Tieté, a westward-flowing stream that is a tributary of the Paraná. The impounded waters are dropped over the crest of the Serra nearly 2,400 feet to a power plant at Cubatão, on the coastal lowlands back of Santos.

The American-owned group of companies has also expanded its facilities in recent years and is prepared to proceed with other projects as soon as adequate financing is completed. Its Brazilian affiliate, Companhia Auxiliar de Emprêsas Elétricas Brasileiras, has recently completed new plants raising its aggregate generating capacity from 169,000 to 202,000 kw. In 1946 the Petí hydroelectric plant, supplying Belo Horizonte, and the Avanhandava plant, near Penápolis, in the state of São Paulo, were inaugurated. A third unit of the Chaminé hydroelectric plant supplying Curitiba (Paraná) has been placed in operation. Hydroelectric development at Areal in the state of Rio de Janeiro is under way. Capacity of thermoelectric plants at Pôrto Alegre and at Salvador (Bahia) will be increased.[2]

New Installations to Increase Service

There are comparatively few large private power plants. Some new installations have been made in recent years as the result of inadequate public utility power. The Belgo-Mineira iron and steel works has plans for considerable expansion through a new plant on the Piracicaba River, a tributary of

2. A credit of $8,278,000 to twelve of the operating subsidiaries of the American and Foreign Power Company in Brazil was announced by the Export-Import Bank of Washington on December 23, 1948. This credit is to cover the cost of United States equipment, materials and services required for the first stage of an expansion program, embracing those projects to be completed in 1949, including the installation of 61,222 kw. generating capacity (of which 48,000 kw. will be hydroelectric) and associated transmission and distribution facilities. The expenses in Brazil, amounting to $4,872,000, are to be covered by the Brazilian companies and the American and Foreign Power Company.

the Rio Doce. The Cia. Aços Especiais de Itabira, S. A., is also putting in a plant on the Piracicaba. The National Steel Company has a thermal plant at Capivarí de Baixo (Santa Catarina) consisting of three units totaling 2,300 kw. that provides power for its coal-washing plant. Gold-mining and coal-mining companies, a cement factory and various manufacturing plants have installations of some size. Some processing plants have Diesel installations.

Hundreds of small local utilities, both municipally owned and privately owned, are scattered through the country. Many of these are antiquated wood-burning installations, and some are on their last legs. Recently British-owned plants at Belém (Pará) and Fortaleza (Ceará) were taken over by the government on the grounds of inadequate service. In both cases operating profits on light and power were inadequate to offset losses on tramway operations at the officially established rates.

Several state governments have drawn up plans for power development. In 1946 Rio Grande do Sul set up a mixed corporation known as URGUE (União Riograndense de Usinas Elétricas, S. A.) to expand power capacity. It took over some uncompleted projects, and announced plans for a number of thermal and water-power installations. The previous Minas Gerais State administration had several projects under study, including utilization of the rapids of Fêcho do Funil on the Paraopeba River and level differences on the Santo Antônio River. The present administration is understood to have abandoned the Funil proposal, owing to the porous soil conditions, but is investigating other plans that will conform to the federal government's scheme for the development of the São Francisco Valley.

Paulo Afonso Project

The federal government has recently launched its long-discussed proposal for a large hydroelectric installation at the Paulo Afonso falls, about two hundred miles from the

mouth of the São Francisco River, with a view to supplying power not only to the adjacent areas in the states of Bahia and Alagoas but also eventually to the coastal cities from João Pessoa to Salvador. Official studies indicate that the minimum flow in the river is sufficient for a total installation of 440,000 kw. In the beginning one or two units of 56,000 kw. will be installed. A pilot plant of 5,000 kw. is now being built, using a small flow from one branch of the river. One unit of 2,500 kw. is nearing completion.

The Companhia Hidro-Elétrica do São Francisco is being organized with an initial capital of Cr. 400 million ($20 million), of which about half will be subscribed by the federal Treasury. The remainder has been taken up as follows: state governments of Bahia, Paraíba, Alagoas and Sergipe, Cr. 77 million; municipal governments of Paraíba, Cr. 20 million; social security institutes, Cr. 80 million; public subscriptions, Cr. 26 million.

Redeeming São Francisco Valley

The middle São Francisco Valley has long been one of the "problem areas" of Brazil. The authorities hope that the development of electric power will attract industries and stimulate agriculture. Plans call for a transmission line to Belém, about eighty miles upstream, initially, later to be extended another hundred miles to Boa Vista. About half of the narrow belt of valley land on the left bank of the river is considered irrigable. Crops considered suitable are long-staple cotton, sugar-date palms, bananas and other fruits, as well as local food crops. Since 1943 the Ministry of Agriculture has been developing an agricultural-industrial settlement at Itaparica, where the falls of that name are used to develop some electric power.

The need for practical steps to redeem this area is generally recognized, but some observers believe that the Paulo Afonso power project is premature. The construction of transmission lines and receiver systems to serve the coastal

cities is expensive in view of the distances involved. Furthermore, the existing and prospective industries of that area are not large consumers of electric power. In the sugar industry, the leading coastal industry at present, the use of bagasse as fuel is indicated. A cement plant has been established at Recife and one is contemplated for Salvador. Although cement manufacture utilizes electric power, burning fuel for the kilns is required. The availability of natural gas and of increasing supplies of locally produced petroleum also have changed the outlook since Paulo Afonso was first considered. The electrification of the railways of the northeast will hardly be feasible in the near future. Not only is the traffic too light, but furthermore the roads would have to be rebuilt entirely.

The largest steam plants in Brazil are at Pôrto Alegre, in the south, near the coal fields, and at Recife and other coastal cities of the east and the northeast.

The five greatest waterfalls in Brazil are the Guaíra falls, or Cachoeira de Sete Quedas, on the Paraná River, at the western border of the state of Paraná, which is estimated to have a potential of 1.5 million h.p.; the Paulo Afonso falls, just mentioned; the Iguaçu, or Santa Maria, falls on the Iguaçu River, state of Paraná, on the Brazilian-Argentine border, with about 340,000 h.p. potential; the Urubú-Pungá on the Paraná River between São Paulo and Mato Grosso (250,000 h.p.); and the Marimbondo falls of the Rio Grande, on the São Paulo–Minas Gerais border, with about 150,000 h.p.

President Dutra's Recommendations

In his message to Congress on March 15, 1948, President Dutra said that Brazil needs an annual increase of 200,000 kw. in installed capacity and an estimated annual investment in electrical services of $74 million, of which about one third would be imported equipment. The government, he stated, obviously cannot assume responsibility for such an

undertaking. As the greater part of the investment must come from private capital, he recommended measures to support and stimulate private initiative, above all through long-term credits and low interest rates, in which he hoped investment and insurance companies would assist. The government, he said, is making studies of rural electrification and of the present water code.

Chapter 7

MANUFACTURING INDUSTRIES

MANUFACTURING INDUSTRIES now comprise one of the major sectors of the Brazilian economy. The best available estimates indicate that the value added by manufacture is approximately equal to the value of agricultural and livestock production.

Brazil is perhaps the most industrialized of the Latin American countries. Modern factories first appeared in numbers in the 1880's and 1890's. Year by year new factories have appeared, or old ones have been enlarged, with particularly rapid spurts during the prosperous years at the beginning of this century and during the two world wars. Some important industries, like steel, cement, coal and publishing, made rapid strides during the 1930's.

Most developments have been in the field of consumer goods. Cotton textiles first achieved importance, followed by shoes, printing, soap, furniture, matches and other articles of wide use. At the same time various food-processing industries became more mechanized: sugar and flour milling, meat packing, biscuit and spaghetti manufacture, brewing. The development of large public utilities, especially in the Rio–São Paulo area, facilitated industrial expansion.

Dependable recent statistics are lacking. Preliminary returns from the 1940 census show a total of about 50,000 industrial establishments, employing approximately a million persons, with the total value of production equivalent to $859 million. (See Table 10.) The best-informed estimates indicate that the gross value of production has since increased to nearly $3 billion.

Industrial activities are concentrated to a large degree in

TABLE 10

INDUSTRIAL CENSUS OF 1940

Industry	Number of Establishments	Personnel		Value of Production	Value Added by Industry
		Total	Operatives		
				(*In Thousands of Dollars*)[a]	
Total	49,418	960,663	781,185	859,050	387,150
Mineral extraction	2,267	35,433	27,949	10,000	8,150
Plant extraction	1,791	20,495	15,373	5,600	4,250
Metallurgy	1,460	61,338	53,844	49,400	24,450
Mechanical industries	694	25,624	21,535	38,650	17,600
Processing of nonmetallic minerals	4,861	57,416	46,466	29,200	17,000
Wood and manufactures	5,614	66,088	50,901	34,600	17,150
Paper	228	12,318	10,642	13,750	4,700
Rubber	65	4,524	3,707	4,600	2,050
Vegetable oils and waxes	174	7,895	6,877	12,750	4,000
Hides and skins	1,297	14,598	11,587	15,550	5,400
Hair, feathers and animal by-products	18	310	261	200	50
Chemical and pharmaceutical products	1,610	36,008	27,429	58,500	30,600
Textiles	2,212	233,443	216,477	180,950	70,650
Clothing and shoes	3,218	49,360	40,866	36,600	15,500
Food products	14,905	173,495	125,736	245,600	75,650
Beverages	1,701	29,929	21,751	34,400	21,250
Construction	1,243	61,123	53,727	48,200	30,150
Electricity, gas, water, etc.	3,218	28,983	14,995	13,250	23,600
Printing	2,207	31,617	22,120	20,550	11,450
Others	635	10,666	8,942	6,700	3,500

Source: Preliminary data published by *O Observador*, Rio de Janeiro, Ano XIII, No. 147 (April 1948), pp. 33-45.

a. Converted at the rate of $.05 per cruzeiro. Value figures cover the year 1939.

São Paulo State and the Federal District; these two regions include over half of the total number of industrial workers. Next in order are the states of Rio Grande do Sul, Pernambuco and Minas Gerais.

Large Textile Industry

Brazil is practically self-sufficient in all types of textiles, except for small imports of the better grades of cotton, woolen, silk and linen materials.

About a quarter of all Brazilian industrial workers are in the cotton textile industry. The greatest concentration of plants is in São Paulo, the Federal District, Pernambuco, Minas Gerais and Rio de Janeiro State. Six mills have over five thousand workers each; one mill has over ten thousand workmen. Annual production of cotton piece goods is around 1.32 billion yards.

Brazil has been a regular exporter of cotton cloth since the first world war. Prior to 1939, exports ranged between 800,000 yards and 8.5 million yards. The high point in volume was reached in 1943 with 290 million yards, and the peak value in 1945 with $75 million. In addition, some yarn and other articles are exported. Argentina, Uruguay and Chile have been the principal markets.

The principal textile mills in Brazil have been going for sixty or seventy years, and most of the machinery is old. All except a small proportion of the looms are of the hand shuttle-change type. Weavers normally handle only two or three looms. Nevertheless, Brazil has been receiving fair amounts of new machinery, especially during 1946 and 1947. One of the largest cotton mills in South America is nearing completion at Ribeirão Prêto in São Paulo. It will have 80,000 spindles and sufficient looms to produce 175,000 yards of cotton fabric daily.

Wool and Other Fabrics

The woolen and worsted industries also expanded during the war, but a substantial part of the better-grade suitings are imported. Brazil produces a surplus of coarse wool but must import a large part of its requirements of finer wools either in the form of wool tops or yarns. Efforts are now being made in Rio Grande do Sul to develop flocks of finer-fleeced sheep.

The rayon yarn industry consists of four firms with a combined annual production of ten thousand tons, which meets virtually all domestic requirements. These four com-

panies, located at São Paulo, are enlarging their capacities. Cellulose and caustic soda are imported, but the nitrocellulose plant of Companhia Nitro-Química uses local cotton linters. The largest firm, I. R. F. Matarazzo, has an interest in a rayon factory in Colombia.

Rayon weaving is carried on by a few large firms and several hundred smaller establishments. Most of the industry is centered at São Paulo. About 130 million yards of piece goods were produced in 1946, and in addition 6.5 million pairs of rayon or part-rayon stockings.

Exports of both cotton and rayon goods were restricted during most of the year 1946.

Other branches of the textile industry include the spinning and weaving of jute; the manufacture of linen cloth from domestic flax; the utilization of ramie, guaxima, caroá and various local fibers; a large knit-goods industry; the weaving of millions of towels, bedspreads and tablecloths; and the manufacture of shirts, dresses, underwear, collars and the like.

Sericulture was introduced into Brazil during the nineteenth century, but the silk industry became established only after the first world war. Especially after the coffee crisis of 1929, millions of mulberry trees were planted, and Japanese and Italian immigrant families took up silk culture, principally in western São Paulo. The industry expanded rapidly during the war, reaching a peak production of about six million kilograms of green cocoons, but later collapsed when Far Eastern supplies again became available. A silk-weaving industry has also developed. Most of the reeling and weaving equipment was built in the country. An effort to revive the industry by introducing more machine methods is being made.

Chemical Industries Expanding

Common soap, candles, matches and other articles of wide use have long been manufactured in Brazil, utilizing both

domestic and imported materials. The variety of articles produced has gradually expanded to embrace a wide range. As the textile, leather, glass, paper, pharmaceutical, cosmetic and plastic-molding industries have expanded, the local market for basic industrial chemicals has increased. Local plants now supply most of the requirements for citric, acetic, nitric, hydrochloric and tartaric acids. Potassium chlorate and aluminum sulphate are made by several companies. Sulphuric acid is made principally from imported sulphur, but some is also produced from local pyrites, waste gases of a zinc plant and other sources. One of the leading producers is the Companhia Nitro-Química Brasileira. Its plant at São Miguel, a suburb of São Paulo, is one of the largest chemical establishments in South America. Viscose-type rayon will be produced by a new addition.

For some years chlorine, caustic soda and hydrogen have been produced by the Cia. Elétro Química Fluminense, at Alcântara in the state of Rio de Janeiro, and a new electrolytic plant has been erected by British-American interests in the state of São Paulo on the Santos-Jundiaí Railway near the source of hydroelectric power. Because alkalies comprise one of the largest items of chemical imports (consumption averages 35,000 tons of soda ash and 50,000 tons of caustic soda annually), the Brazilian government is promoting a national industry.

The National Salt Institute (Instituto Nacional do Sal), established in 1940 to rationalize the salt industry, undertook studies of the problem. In 1943 the Companhia Nacional de Álcalis was formed, with a capital of Cr. 50 million ($2.5 million), the Salt Institute controlling the majority of shares. Cabo Frio, a cape sixty-two miles east of Rio de Janeiro and a historic center of salt making, was chosen as the site for a Solvay plant. Salt would be obtained from sea water and lime from extensive deposits of sea shells. Peat is also available for fuel. Most of the initial capital of the company was spent on a hotel, housing, warehouses, and on a large

staff and offices in Rio de Janeiro. Efforts to get Bank of Brazil financing failed. In April 1947 the Export-Import Bank of Washington gave tentative approval to a loan of $7.5 million, subject to an increase in the capitalization of the company and other conditions. An increase of capitalization to Cr. 100 million ($5 million) was approved by stockholders in January 1948, and the management of the company was changed.

The pharmaceutical and cosmetic industries have expanded steadily since World War I. One of the leading manufacturing concerns is of French origin. German laboratories developed during the interwar period were taken over by the Brazilian government during the recent war. A number of American manufacturers of proprietary products have established branch factories or licensed Brazilian firms on a commission, royalty or profit-sharing basis.

The plastics-molding industry is now fairly large, although development has been retarded by shortages of raw materials and inadequate equipment. Most of the machines in use were built in Brazil. Some galalith and ebonite are produced in Brazil.

Agricultural Insecticides and Serums

The need for insecticides, fungicides, animal dips and fumigants is great, owing to the tropical climate and prevalence of insects. It is estimated that the sauva ant alone destroys up to 30 per cent of the crops in some years and sections. Carbon bisulphide and sulphur-arsenic preparations are used for ant control. Large amounts of lead arsenate are imported for pest control in the cotton fields. Copper sulphate is required in the vineyards. The Brazilian government sanitary services make extensive use of DDT in malaria and yellow fever control. Sales of household insecticides have increased. Among the local raw materials used are white arsenic, pyrethrum flowers, rotenone-bearing roots, tobacco wastes and coal-tar by-products of gas and coke plants.

Livestock serums are produced in Brazil, but the output is inadequate and the quality has not been standardized. The Butantan Institute at São Paulo, world famous for its snake serums, has a research department for study of various diseases.

Brazil is an important exporter of crude drugs, essential oils, waxes and essences, and beeswax. During the war substantial shipments of pharmaceutical and chemical products were made. The country may be expected to retain part of this business, as well as markets for caffeine, emetine and other products.

Imports of some crude materials, industrial chemicals, and high-quality pharmaceutical and toilet preparations will continue to be needed, but further expansion of local manufacture, greater utilization of domestic sources of raw materials, and processing for export, may be anticipated. The market for some products is expanding rapidly. The need for additional production and use of agricultural insecticides and serums is great.

Foodstuffs and Fisheries

The foodstuffs group of industries embraces a wide variety of activities. Some have already been mentioned: sugar milling and refining, meat packing, flour milling, rice cleaning, and the manufacture of lard, edible oils, preserved milk and other dairy products. Preservation of fruits, vegetables and fish has attained significant proportions. Modern factories have recently been installed at Rio de Janerio and São Paulo to manufacture ice cream.

The beverage industries have expanded. The brewing industry has long been a substantial one. Two principal concerns, the Brahma and the Antártica, have breweries in most of the principal cities. Part of the malt and most of the hops are imported. *Cachaça,* or sugar-cane rum, is produced in most parts of the country; its peculiar odor has defeated attempts at exportation. In addition to wine, some

vermouth and brandy are made. Brazil has long produced a notable variety of refreshing, nonalcoholic beverages, flavored with local fruits and nuts. Despite the excellence of the local products, newly introduced American brands have acquired wide popularity. The bottling of natural mineral waters is also a considerable industry. The mineral springs are the property of the government. Comfortable hotels have been erected at several of the springs, such as Poços de Caldas and Araxá in Minas Gerais, and São Pedro and Serra Negra in São Paulo; these attract large numbers of visitors.

Fisheries have had a very slight development in Brazil, considering that the country has 4,600 miles of coast, thousands of miles of navigable rivers and many lakes. Before the war Brazil imported more than 26 million pounds of fish annually, chiefly codfish and sardines. There has been some expansion of fresh fish consumption and of the drying and canning industries. In 1943 there were about eighty thousand fishermen, most of whom operated with canoes and *jangadas* (homemade sail rafts). Rio Grande do Sul has the principal commercial fisheries. Canneries and freezing units were installed during the war. Heretofore most of the catch has been from shallow lagoons like the Lagôa dos Patos, but two large concerns have taken steps to obtain seagoing fishing vessels. Fish canneries are also located at Rio de Janeiro and Recife.

There are said to be eighteen hundred fish species in the Amazon river system but only a few are utilized commercially. The principal one is the traditional *pirarucú,* a large codlike fish that is salted and sold in all markets. The *peixe-boi* (sea cow), an aquatic mammal, is caught for its skin, which is used for belting. The principal fish along the northeastern "bulge" of Brazil are the *garoupa* (grouper), the *bicuda* and the *voador,* which are dried and sold in the interior; also the *albacora* (swordfish). Shrimp, crab, lobster and turtles are caught. From the Rio de Janeiro coast and

southward sardines are abundant, as are anchovy, grouper, corvina and shrimp.

Pulp and Paper

Brazil produces about 90 per cent of its consumption of paper other than newsprint. Practically all types are produced to some extent, but high-grade writing, design and drawing papers are imported. Most of the cigarette paper is imported. Although per capita consumption of paper is small, it is increasing steadily as the result of increasing literacy, expansion of the printing and publishing industries, and growing commercial and industrial applications. There are a large number of newspapers and trade journals; the presses of the federal and state governments are active; and three important book-publishing firms, at Rio de Janeiro, São Paulo and Pôrto Alegre, as well as various smaller ones, have in recent years issued a steady stream of volumes by Brazilian authors as well as popular translations of many foreign works.

The use of printed paper and cellulose bags for packaging food products has expanded notably. Heavy-duty bags for cement, lime, sand, charcoal, bananas (for export), and similar products are manufactured by the Bates Valve Bag Corporation of Brazil.

Until recently, Brazil imported most of its newsprint and pulp. During the war, production of chemical pulp rose to about 9,000 tons and mechanical pulp to about 50,000 tons. In 1940 the Indústrias Klabin do Paraná began work on a plant at Monte Alegre (Paraná), designed to produce 30,000 tons of sulphite, 40,000 tons of mechanical pulp and 40,000 tons of newsprint annually, representing an investment of $25 million. The principal backers are the Klabin family at São Paulo, who also control the leading paper factory in Brazil. The mill is located on a 420,000-acre fazenda, on the east bank of the Tibagí River. It has an airport and a station on the Paraná–Santa Catarina Railway, three hundred

and fifty miles from the city of São Paulo. A hydroelectric plant was built on the Tibagí River.

Wood supplies will be obtained from the Paraná pine growing on the property. Reforestation is being undertaken, but Paraná pine does not grow readily, and new growth would require twenty years. Over two million eucalyptus trees have been planted, but it is not certain these will be suitable for making cellulose.

Sulphur and other chemicals must be imported. An alkali plant to produce one thousand tons of caustic soda annually was near completion in 1948. Sulphite production began in 1945 and the first newsprint appeared in April 1947. Both plants have been shut down at intervals owing to lack of caustic soda or on account of technical difficulties.

Production and exports of lumber, and the manufacture of furniture, were stimulated greatly by the first world war. World War II gave a great impetus to the plywood industry, although the quality is poor. Most of the factories are located in the states of Paraná and Santa Catarina and utilize Paraná pine. Heavy exports were made for a time to Argentina and Europe, but the domestic demand for furniture and interior decoration has absorbed most of the output. Since the end of the war, demand has declined on account of the high prices for the Brazilian product. Studies have been made with reference to the utilization of woods in the Rio Doce and the Amazon basins. Both regions would appear to have possibilities over the long run, chiefly for export to Europe.

Glass, Leather, Rubber

Brazil supplies most of its requirements for glassware, containers, window glass, light bulbs, pottery, vitreous chinaware and refractories. Two flat-glass factories have been completed since 1943. The Corning Glass Works, of Corning, New York, produces Pyrex ware in conjunction with the Santa Marina glassworks of São Paulo.

Although some imported shoes are sold to persons preferring foreign styles and having sufficient money to gratify their tastes, domestic production satisfies practically all of the demand, with occasional surpluses of shoes and leather for export. A large part of the output is from small shops using principally handicraft methods. Sandals, slippers and alpargatas, as well as rubber-soled shoes, are worn instead of leather shoes by a large part of the population.

During the war the tanneries expanded their equipment and improved their processes. European refugees played a considerable part in this development. Local production of tanning materials also increased: quebracho from Mato Grosso, *barbatimão* and *angico* from the São Paulo area and *Acacia negra,* or wattle, from Rio Grande do Sul. Sodium bichromate and chrome tanning salts are made at São Paulo.

Rubber goods is another field in which Brazil is not only self-sufficient in all except a few specialized items, but has an export surplus. Exports amounted to $11 million in 1945. Annual consumption of crude rubber is about 22,000 tons, all domestic, of which about 80 per cent goes into tires and tubes. Cotton fabrics and duck are produced in Brazil, but rayon cord, carbon black and chemicals must be imported.

Reinforced Concrete Skyscrapers

Brazilian engineering and architectural designs have won international recognition. Because the production of structural steel is of very recent date in Brazil, large structures have been built of reinforced concrete by formulas originally worked out in Switzerland and Germany and skillfully adapted to Brazilian conditions.

Mechanized equipment is still used sparingly, although its use is increasing as buildings go higher and foundations deeper. The small degree of mechanization is illustrated by a personal experience of the writer, whose hotel window overlooked a large hill of crystalline rock similar to many

others in the Rio de Janeiro area. Over a period of weeks he watched workmen with sledge hammers and wheelbarrows hammering away at the rocky flanks of the hill that now occupies a potentially valuable ocean-front site.

Production of cement has increased rapidly since the first modern plant was built in 1926 but has not been able to keep up with rapidly mounting consumption. In 1946 domestic production was 826,000 tons and imports 351,000 tons. Several new plants have recently been established. Shortages of fuel, equipment and raw materials have hindered expansion.

Heavy Industries Appear

It is clear from the foregoing that most of the industrial development has been confined to light goods. At the same time, as was mentioned in Chapter 6, the iron and steel industry is beginning to acquire importance. As Volta Redonda gets into full production, the total output will increase considerably, yet the plant has several hurdles to clear before it can be considered a successful enterprise. Competent observers report that Volta Redonda is ably conducted from a technical standpoint and produces a fine grade of steel. It has also won the sympathetic consideration of the public and the business community through its relative freedom from the political and personal favoritism that has caused so many state-controlled operations to bog down.

The cluster of new industries growing up around Volta Redonda is giving new life to the Paraíba Valley. During 1947 the blast furnaces, the open-hearth furnace and the blooming and rolling mills operated at less than half the normal rated capacity, owing to a shortage of coal and the slow market for structural steel. Some production of rails and cold strip was begun. During 1948 the output of pig iron and steel products rose sharply, and the production of tinplate and galvanized products was inaugurated.

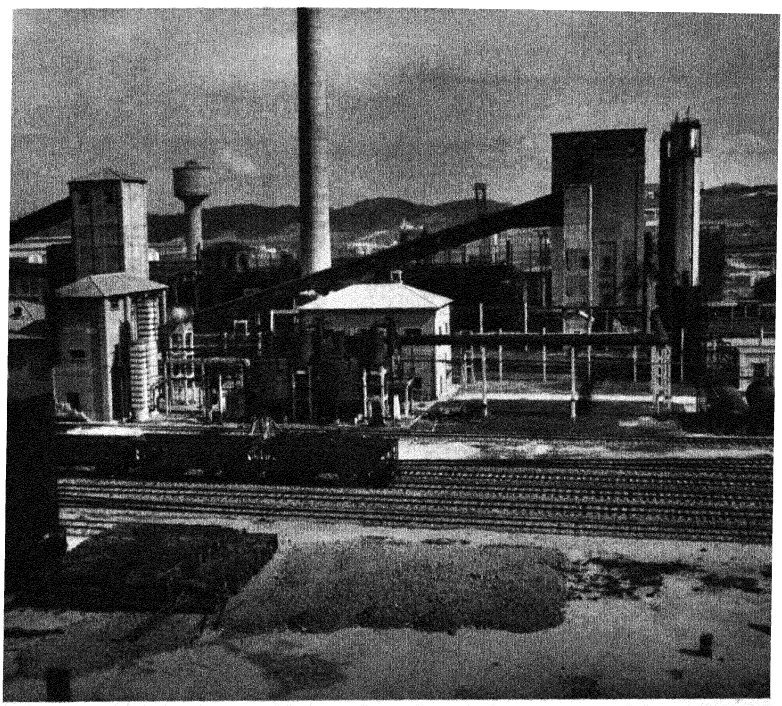
The plant is unfortunately located from the standpoint of

coal supplies. Costs are likely to remain high, although government departments have been instructed to buy Volta Redonda products even when they are more expensive. In practice, the charcoal-iron mills are doing better than Volta Redonda, and several new ones have been placed in operation in recent years.

Two firms in Brazil produce centrifugally spun iron pipe: Cia. Ferro Brasileiro, at Caeté (Minas Gerais), and Cia. Metalúrgica Barbara, at Barra Mansa (Rio de Janeiro).

The principal products of the smaller mills are reinforcing bars. The Belgo-Mineira Company produces light rails, bars, wire and miscellaneous products. High-grade tool steel is produced by Pirie Villares e Cia., Ltda., at São Paulo. Associated with it is Elevadores Atlas, S. A., the principal elevator manufacturers in Brazil. The head of this firm, an outstanding engineer, is related to Santos Dumont, the air pioneer. Another company that produces high-quality steel castings is the Fabrica de Aço Paulista, S. A., at São Paulo, directed by a Swedish engineer long resident in Brazil. Brazaço, S. A., Brazilian subsidiary of United States Steel, has a high-treatment plant at São Paulo. A representative of the National Malleable and Steel Castings Company of Cleveland has been investigating Brazilian possibilities.

The Cia. Aços Especiais de Itabira, S. A., is building a 50,000-ton-per-year special steel plant at Coronel Fabriciano (Minas Gerais), in the Rio Doce Valley, two hundred and ninety miles from Vitória. Quarters for a permanent working force of six hundred have been built at the new townsite of Acesita. A blast furnace to produce pig iron for sale from Itabira canga is nearing completion; it will use charcoal fuel. Production of special steels must await completion of the hydroelectric plant being built near Sá Carvalho, twenty-three miles upstream from the plant on the Piracicaba River, a Rio Doce tributary. Percival Farquhar, at eighty-five dean of the American colony in Brazil, is one of the directors of this company.



WARTIME EXPANSION IN STEEL is symbolized by this modern coke and by-products plant at the Volta Redonda works of the National Steel Company (Companhia Siderúrgica Nacional). This whole development was begun in 1941, with financial and technical assistance from the United States.

Railway Car Manufacture

Four companies are now making railway cars. The Fábrica Nacional de Vagões, S. A., operates at Cruzeiro (São Paulo) and in the Federal District. The latter plant was purchased from the Pullman-Standard Car Export Corporation. The Cia. Sorocabana de Material Ferroviário, at São Paulo, has recently formed a connection with General American Transportation Corporation of Chicago, which will enable the Sorocabana to build specialized cars. Until late 1947 this company had bought its steel in the United States, but the general manager, Mariano J. M. Ferraz, informed the writer that they would buy in the future from Volta Redonda. Sociedade Industrial e Comercial Santa Mathilde, Ltda., has a plant at Conselheiro Lafaiete (Minas Gerais). Potentially the most important is the Cia. Brasileira de Material Ferroviário (known as Cobrasma), which has just completed a factory at Osasco, a suburb of São Paulo. Its stock is controlled by the principal railways and steel companies. Technical assistance is provided by the American Steel Foundries of Chicago.

During the war, production of numerous types of machinery was initiated or expanded, including machine tools, time clocks, looms, silk-reeling equipment and looms, plastic-molding equipment, distilling equipment, electric motors and scales.

United States Branch Factories Expanding

Subsidiaries of American firms have expanded operations. General Motors has doubled the area of its assembly plant at São Caetano, near São Paulo. Ford has an assembly plant in São Paulo city and has bought a site for expansion. Chrysler and Studebaker cars are assembled by Brazilian-financed organizations.

General Electric has a transformer, meter and light bulb factory at Rio de Janeiro and a small radio factory at São Paulo. It is now completing at Santo André (São Paulo) a plant to make induction motors. Standard Elétrica, S. A.,

is producing an extensive line of telecommunications and signaling equipment.

Welded steel pipe is made by Armco Industrial e Comercial, S. A., in its plant at Honorio Gurgel, a suburb of Rio de Janeiro.

Tin cans are made by several companies, notably Metalúrgica Matarazzo, with which Continental Can is associated.

Steel drums are made by Indústria Brasileira de Embalagem, S. A., of São Paulo and by an affiliate of the Rheem Manufacturing Company at Rio de Janeiro.

Brazil produces the larger part of its hardware consumption and about one fourth of its agricultural machinery needs.

Several strong companies operate in the nonferrous field. The principal figure, Francisco Pignatari, a relative of the Matarazzos, controls a number of companies making aluminum, copper, brass and silver articles, silver and nickel silver tableware, aluminum foil, slide fasteners and airplanes. Raw materials are imported, except silver, steel and some tin. In this group is also the only electrolytic zinc plant. A new company, Alumínio do Brasil, S. A., has recently been formed by Pignatari in conjunction with Aluminium, Ltd., of Canada, to build an aluminum-rolling mill at Mogi das Cruzes in the state of São Paulo. Canadian-produced aluminum will be used.

Indústria Sul Americana de Metais, S. A., at Santo André (São Paulo), a pot and pan factory, is expanding operations, with Revere Copper and Brass Co. participating, to produce basic copper, brass and aluminum articles. Pirelli, S. A., of São Paulo, with Brazilian, Italian-Swiss and American interests, produces about twelve hundred tons monthly of copper wire and cable and allied products.

During the war, construction was begun on two plants in the state of Minas Gerais to produce alumina and aluminum, utilizing bauxite deposits in that state. A plant at Ouro Prêto began operations in 1945 but later closed down.

S. A. Tubos Brasilit of São Paulo manufactures cement-

asbestos pipe and sheets. Some asbestos is now produced in Bahia and new operations are reported near Governador Valadares (Minas Gerais).

Impulses Behind Industrialization

Industrialization has been promoted in recent years by the following factors:

- The difficulty of obtaining many types of goods
- Protection afforded by high customs duties and exchange restrictions
- Export restrictions on certain kinds of raw materials
- Financing by the Banco do Brasil and other official institutions, as well as direct promotion by the federal and state governments
- Financial assistance provided by the United States government and the increased purchasing power resulting from wartime and postwar procurement programs and other operations
- Availability of electric power in the most important industrial zones
- The desire of the military authorities to establish production of munitions and defense materials
- The large profits derived from manufacturing operations

In addition to these specific considerations, a stimulus to manufacture for domestic consumption has developed from the prevailing pessimism about the outlook for any large expansion of exports, or even the possibility of retaining existing levels. This feeling is based on some relatively temporary factors, such as the international political situation and the current exchange shortages, as well as on more basic doubts regarding the prospects of competition with areas like Africa and the Far East, with their teeming millions of workers, or with countries like Argentina, which have richer soils and more favorable climatic and transport conditions. In any case, emphasis has shifted from export-mindedness to a desire to utilize national raw materials for

local industries. Furthermore, the benefits of industrialization have been sufficiently widely distributed to whet the appetites of both the middle and the working classes. The new industries have opened up thousands of relatively well paid positions to technicians and managers, as well as opportunities for technical training and advancement. Industrial workers are in a more favorable position than their country cousins, with better pay, better housing, educational opportunities for their children, recreation and hospital facilities and a more stimulating social life.

Industrial Profits

Industrial concerns have made impressive profits for some years. An analysis of the published balance sheets of 256 corporations operating in the state of São Paulo in 1942 showed that the median ratio of net profits to invested capital was 34.4 per cent. One third of the companies made a net profit of over 50 per cent, while twenty-five companies made over 100 per cent profit. A similar study of São Paulo enterprises for the years 1946 and 1947 showed the following results for various industrial groups:

	Number of Firms		*Earnings as Percentage of Capital Plus Surplus*	
	1946 *	*1947* †	*1946*	*1947*
Textiles	79	115	22.6	13.3
Food	31	43	16.8	14.6
Metallurgy	38	55	16.2	13.1
Chemical and pharmaceutical	17	36	19.3	13.6
Paper	8	12	16.7	9.9
Printing	5	10	22.3	16.9
Glass and ceramics	7	15	20.3	21.8
Clothing	5	11	29.8	18.1
Electrical apparatus	2	7	4.4	9.7
Furniture	4	3	19.4	21.4
Mining	2	5	7.3	8.4
Construction	4	8	30.9	20.9
Equipment	3	12	25.5	46.5

	Number of Firms		*Earnings as Percentage of Capital Plus Surplus*	
	1946 *	*1947* †	*1946*	*1947*
Tobacco and matches	1	4	22.9	10.9
Jewelry	1	3	7.0	30.9
Miscellaneous	15	34	17.7	16.0
	222	373	19.0	15.4

* Includes firms having combined capital and surplus in excess of Cr. 10 million ($500,000).

† Includes firms having combined capital and surplus in excess of Cr. 5 million ($250,000).

Source: *Conjuntura Econômica,* Rio de Janeiro, Ano II, No. 12 (December 1948), p. 11.

These figures show only the average rate of profit. Individual firms made much larger returns. For example, a large chemical firm producing dyestuffs made 123 per cent profit. The great firm of Matarazzo, which controls 286 separate enterprises, made 90 per cent profit on its paid-up capital in this period.

A study of 480 corporations registered in the Federal District having combined capital and reserves of $480 million and an annual turnover of $150,000 or more showed the following profits reported for the year 1946:

	Percentage Profits on:	
	Capital	*Capital Plus Reserves*
Textiles	43	23
Chemicals	33	25
Electrical materials	36	29
Tobacco and matches	54	43
Paper	43	32
Glass and ceramics	8	7
Furniture and utensils	199	42

Source: *Conjuntura Econômica,* Rio de Janeiro, Ano I, No. 2 (December 1947), pp. 8-12, and Ano II, No. 1 (January 1948), pp. 9-15.

Prices

Retail prices of made-in-Brazil consumer goods are substantially higher than prices of similar products in the United States. Some cotton materials of good quality are made, but most of the output is very poor. Cotton cloth is narrower than in the United States, but prices calculated per square yard run from 30 to 50 per cent higher. Domestic woolen cloth of fair quality costs about $9 or $10 a meter. Kitchen utensils are 50 per cent higher. Prices of ready-made shoes are one third higher, while trunks and suitcases of poor quality cost two or three times as much as better articles in the United States. Most of the writing paper seen in the shops is of fair quality at best and is high-priced. Subsidiaries of American firms have, for the most part, maintained the quality of their products and have attempted to follow a pricing policy that will permit the development of volume sales, but in some instances the Brazilian authorities have required them to raise their prices in order to enable higher-cost Brazilian producers to compete.

Owing to the lower wage scale in Brazil, service is considerably cheaper in Brazil than in the United States. Sales of many types of ready-made goods are limited by the dependence on home or handicraft production. Women make their own dresses or engage the services of seamstresses or dressmakers. At the same time the cost of such services is rising, and as more women take employment the demand for ready-made articles increases. A large part of the shoes and much of the furniture and jewelry are made to order. In the small towns the markets offer an astonishing variety of handicraft articles.

Reasons for High Prices

The high prices of most manufactures are the result of complex causes. One reason is the small scale of operations and the lack of specialization, although this is a minor factor in the case of staple articles like cotton goods, hats and

shoes. Another is the poor quality and the lack of standardization of raw materials, which affect the textile and the shoe industries to some extent as well as other industries. Not a few of the Brazilian factories are efficiently organized and ably managed, but in others, factory layouts are poor and wasteful of labor. The relatively low wage scale and the absence of external competition in highly protected industries tend to perpetuate inefficient practices, as long as the owners continue to receive comfortable incomes from the operations. Poor transport facilities and losses from damage and pilferage are other reasons. The author was told by several manufacturers that they ship only by truck or airplane, owing to losses and high insurance rates on shipments by rail or coastal carriers. Allowance must also be made for high profits on both manufacturing and distribution, and for stiff interest rates on bank loans.

Since most manufacturing operations are dependent upon imported chemicals, raw materials and equipment, wartime scarcities in some cases provided a justification, and in others an excuse, for higher prices. Much of the machinery in older industries like cotton textiles and leather manufacture is old and inefficient. Despite shortages, a substantial amount of new equipment has been installed, and more is on the way. At the same time it is unrealistic to talk of completely re-equipping the old plants so long as the present shortage of skilled workmen prevails and until there is further change in the relationship between wage rates and the cost of new machinery.

A large segment of Brazilian industrialists is keenly aware of the need to improve techniques and skills, the more so if they hope to gain export markets or to hold markets that fell into their laps during the war. As a consequence many firms, both large and small, are anxious to associate themselves with progressive American manufacturers who can provide the techniques required to put their enterprises on an efficient basis. In some cases the additional capital that

United States firms can put into the business is welcome as providing an opportunity to expand operations, since capital is more expensive in Brazil than in the United States. But in most instances the essential things are the specialized equipment, the training of local personnel and the accumulated results of American research and processes. Not so long ago the majority of Brazilians were content to leave the industrial field to foreigners and immigrants, but members of the new generation, whether sons of immigrants or scions of old families, want to have an active part, as well as to take their cut in the profits.

Interest in Technical Training

Interest in technical training, both on the professional and the worker levels, has increased. There are now about ten thousand civil engineers in Brazil but only a handful of industrial engineers. Until 1874 engineering had been taught only in the military schools. In that year the polytechnic school at Rio de Janeiro (now the national engineering school and a part of the University of Brazil) was organized. In 1893 the polytechnic school at São Paulo was created. At that time and long afterwards the main emphasis was on public works and railway construction. Engineering of college level is now taught in thirteen institutions. Three of these offer courses in several fields, while ten are specialized, six teaching civil engineering, one architecture, one chemical engineering, one electrical engineering and one mining and metallurgy. Engineering graduates total about four or five hundred annually.

Around the polytechnic school at São Paulo has grown up the most advanced center of technological research in Brazil or even in Latin America. Testing laboratories, with Swiss equipment, were installed in 1899 under the direction of Swiss engineers. Its period of most rapid expansion came after 1926 when Dr. Ary F. Torres, now a prominent industrialist of São Paulo, was made director, after a year's

study at Zurich. In that same year the first modern cement factory was established in São Paulo State. The tests and training conducted at the polytechnic laboratories had a profound influence on the subsequent trend of construction methods and designs in Brazil. In 1934 the Instituto de Pesquisas Tecnológicas was established as an annex to the school; it was designed to be the state testing laboratory or "bureau of standards." Dr. Torres is now the director of the institute.

The engineering and technical schools of the Instituto Mackenzie, formerly Mackenzie College, established by American missionaries, have had much influence in giving a practical turn to training in those fields over the last half century. The mining school at Ouro Prêto has a number of distinguished graduates, principally in the mineral industries, but some in other technical and administrative positions.

The Ministry of Education has supervision over seventy-one industrial schools in Brazil, of which twenty-four are national trade schools (one in each state, one in the Federal District, plus chemistry and mining schools), thirty-one are state trade schools, and sixteen are private or semiofficial. Since 1942 various agencies of the United States government have cooperated with the Brazilian authorities in a program of industrial education. At present this joint undertaking is carried on through the Comissão Brasileiro-Americana de Educação Industrial (CBAI). Under this program forty Brazilian teachers in trade schools were brought to the United States for a year's experience in United States schools and factories (ten school directors were brought to the United States under another program), while vocational specialists of the United States Institute of Inter-American Affairs in Brazil conduct courses and give assistance in the organization and operation of industrial education and job analysis. The deficiencies of the Brazilian trade schools are similar to those of education in general: shortage of trained teachers, lack of equipment, poor health of students and failure to

adapt the work to the real needs of the community. In some instances teachers on the payroll have no students. Most teachers have other jobs which are more interesting and possibly more remunerative.

SENAI—Apprentice Training

An important new force in industrial training was introduced in 1942 with the establishment of the Serviço Nacional de Aprendizagem dos Industriários (SENAI), a tax-supported but industry-managed undertaking, which provides part-time apprentice training to boys and girls between the ages of fourteen and eighteen. Its work is supported by a tax of one per cent on the payrolls of industrial establishments; this is paid by the employers. Plants with more than five hundred employees pay an additional 20 per cent of the payroll deduction to provide for scholarships in Brazil and abroad. Nine students have been sent to the Lowell Textile Institute in Massachusetts and two to Bucknell University. Some large enterprises like the railways and public utilities are allowed to maintain their own apprentice schools. In fact, the idea back of SENAI appears to have originated with the technical and professional schools maintained by the railway companies.

Each plant is required to enroll as apprentices a number corresponding to 5 to 15 per cent of the total personnel in the establishment. The length of the course varies from a few months to four years. SENAI has erected a number of fine buildings in the principal centers. Industries located outside these cities must send interns to other centers organized to receive them. The activities of SENAI are not limited to technical training. Basic deficiencies in general education are corrected; medical and dental services are provided; there are restaurants, athletic fields and other facilities.

Vocational education and guidance are also provided in special SENAI schools for twelve- and thirteen-year-old children of industrial employees. The purpose of these

classes is to provide further educational facilities as well as physical and moral guidance for young people who have finished their primary schooling but are too young to accept employment or undertake apprentice training.

The SENAI program resembles the continuation schools in the United States, but is of much wider application. Its avowed program can be of great importance, not only in raising the technical level of Brazilian workers, but also in improving the health and general education of the population. It has not yet succeeded in enlisting the cooperation of all industries, but 70 per cent are now said to be supporting it. Efforts are being made to enforce payment of quotas by all enterprises.

A Brazilian Association of Technical Standards was set up in 1940. Earlier, standard specifications had been established by various public and private bodies. A National Institute of Technology (Instituto Nacional de Tecnologia) has been established at Rio de Janeiro.

New Interest in Economics

The "dismal science" of economics has never had a very large following in Brazil, despite the fame of a few of its teachers. José da Silva Lisboa, later Visconde de Cayrú, adviser to the Regent Dom João, occupied the first chair of political economy in Brazil. He was a follower of Adam Smith and popularized his doctrines in Brazil. Economics has usually been taught in the leading law and engineering schools. The names of Rio Branco and Vieira Souto are associated with the engineering faculties at Rio de Janeiro. Since 1905 commercial schools at Rio de Janeiro and São Paulo have given courses designed to prepare students for the consular service and the work of the Treasury Department, as well as for the general commercial field. In 1937 the Brazilian Economics Association was organized.

The most recent significant developments have been the reorganization of the National School of Economic Sciences,

as a part of the University of Brazil, and the establishment in association with it of the Fundação Getúlio Vargas, which derives support from private sources and also from the revenues obtained from the education and health stamp tax. Count Francisco Matarazzo has donated the funds for the creation of a center of instruction and research in the economic and administrative fields at São Paulo. The Fundação Getúlio Vargas, under the presidency of Luiz Simões Lopes, former head of DASP,[1] has brought together an able group of economists who have initiated studies of national income, wholesale prices and balance of payments. Late in 1947 the foundation launched two useful publications, the quarterly *Revista Brasileira de Economia* and the monthly *Conjuntura Econômica.*

Unfortunately the work of the school of economics itself leaves much to be desired. Only a few faculty members show any real interest in their jobs, the students are undisciplined and apparently the custom prevails of never "flunking" anyone.

The bookstores in Brazil's principal cities carry large selections of technical works, principally in English, but also in French, Spanish, Italian and German. A number of leading textbooks and reference works have been translated into Portuguese.

Outlook and Opportunities

Despite the many who criticize excessive protection of industry and the high cost of various state-supported enterprises that show little prospect of becoming commercially successful, most Brazilians believe that industrialization will go forward, even though it may involve some temporary sacrifices. Many feel that more emphasis should be placed at the moment on transportation, health, power and food supply, leaving manufacturing to expand as market conditions warrant further development. In some sections, in Rio

1. See Chapter 13, under "Plans and Planning Agencies."

Grande do Sul, Minas Gerais, and in the north, numerous prospective small industries and some larger ones have been held back for lack of power. In some instances Diesel plants have been installed to overcome the deficiency. Protection and favors are at times granted too readily to enterprises that consist of local finishing operations using imported semi-manufactures, resulting in higher prices to the consumer without any corresponding economic gain. It is encouraging that more attention is being given to the utilization of local raw materials and to the rationalization of inefficient processes. The financial and technical collaboration of American firms in these fields is constantly being sought.

The development of service industries—laundries, dry-cleaning establishments, motor repair shops and the like—has not kept up with the growth of metropolitan centers. The time is coming when air conditioning will have a big expansion. Refrigeration and food handling also need further attention.

Chapter 8

TRANSPORTATION AND COMMUNICATION

THE INADEQUACY OF TRANSPORT is a refrain that runs through all discussions of economic problems in Brazil. Inadequate it is, and well-planned improvement of the railway, highway and coastal shipping operations should receive a high priority in any economic program. At the same time, inadequate transport is sometimes blamed for difficulties that have their real roots elsewhere. Or, at least, transport problems have their roots in the same soil as several other serious economic and social problems.

Despite their well-known deficiencies, the Brazilian railways handle 80 per cent or more of the national freight traffic and a much larger proportion of the passenger movement. The freight movement in 1946, by type of carrier, was as follows (in thousands of metric tons):

Railways	43,394 *
Coastwise and inland water transport	4,757
Motor vehicle transport	4,000 †
Air transport	7
	52,158 ‡

* Includes 4,440,000 animals at one-half ton each.
† Estimated on basis of 50,000 trucks.
‡ No attempt has been made to estimate tonnage transported by pack animals or animal-drawn vehicles.

Because of the length of the Brazilian coastline and the concentration of population on or near the coast, coastwise shipping is important, but its development has been hampered by the inefficiency of the service and the predominance of export-import trade in the maritime traffic. The relative importance of coastwise shipping in the ports is increasing,

but the airlines are drawing off a large part of the passenger business. Shipping lines will also face more competition from land transport as north-south railway and highway connections are completed.

Brazil ranks among the leading nations of the world in length of airlines and volume of traffic, and services are constantly expanding. In view of the size of the country and the inadequacy of other types of transport, airlines perform a very valuable service to those who are able to pay for it, but aviation hardly touches the real problems, which are, first, the movement of staple foodstuffs and merchandise at a cost that will enable the majority of the people to improve their living standards; second, handling fuel and raw materials required by industry; and third, providing an outlet for exports at a cost that will not handicap their competitive position in world markets. Brazil's efforts to develop heavy industry are seriously handicapped by inadequate rail transport, which has been sacrificed in recent years.

Motor transport is still relatively undeveloped. During his fifteen years in power, President Vargas neglected the valuable highway program launched by his predecessor, Dr. Washington Luis. Road building may soon come into its own. A few good roads, properly maintained, can go far to brighten the transportation outlook. Existing plans, however, probably put undue emphasis on superhighways competing with railway lines, rather than on the construction—and, even more important, the maintenance—of feeder and supplementary roads.

Railways

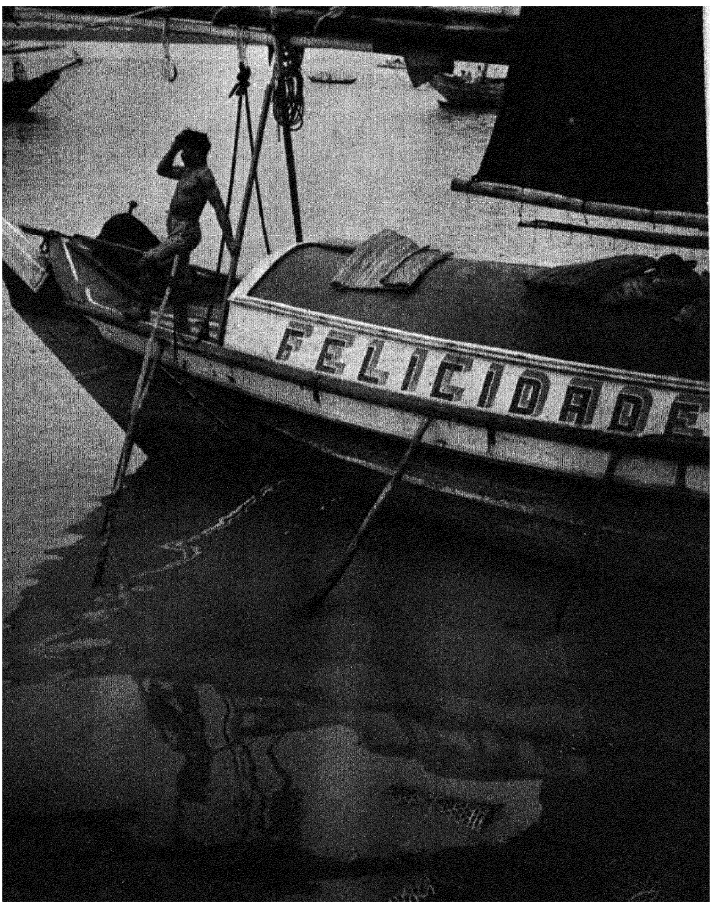
Brazil, with 21,890 miles of railway lines, has a low mileage in relation to area and population. From the standpoint of rail density in relation to territory, Brazil holds fourth place in South America and twelfth in the Americas; judged in relation to population, Brazil is in sixth place in South America and thirteenth in the Western Hemisphere. This

poor showing is to be expected in view of Brazil's vast, sparsely settled hinterland; 70 per cent of Brazil's railways are located in the six southeastern states. More serious is the weak carrying capacity of most of the existing lines.

Much of Brazil's railway mileage retains the outmoded technical characteristics of an earlier era. The early railways had difficulty in getting over the escarpment back of the ports in southeastern Brazil. Furthermore, shortage of capital and the conditions of the construction contracts resulted in long, winding trackage, often with steep grades and sharp curves. As a consequence the average weight and speed of the trains is very low.

Important technical difficulties confront Brazilian railroads besides the needed improvement of right of way. The rolling stock is old and out of date; there is a diversity of gauges which precludes the most efficient use of the existing equipment, and the insufficient supply of good domestic fuel creates a problem. Technical improvement of course requires large new investment, but this investment does not attract private capital, because most of the railroads are operated at a deficit. The poor financial results are due partly to the fact that much of the mileage runs for long distances through thinly populated territory. A combination of the need for public financing with political and military considerations has led to government ownership of a large part of the railway system, the exceptions being mainly the more profitable companies.

The Brazilian railway problem is of three degrees of urgency: first, the immediate need for more rolling stock, including the replacement of many ancient locomotives by more efficient units, and also the replacement of rails and ties; second, the longer-range problem of reconstructing some lines, including a greater degree of standardization, as well as administrative reorganization and regrouping; and third, the completion of interconnections already initiated and the consideration of necessary new construction.



BOATMAN OF THE AMAZON. This sturdy Brazilian looks out from the deck of his boat, which is thoroughly typical of the thousands of small craft that ply the mighty Amazon, whose 15,000 miles of navigable waters make it the rival of the Mississippi as the largest river system in the world.

Trend Toward Nationalization

The history of Brazilian railways shows a fairly consistent trend toward extension of government ownership of the roads, but considerable fluctuation in the extent of government operation.

At the end of the Empire in 1889, 34 per cent of the total mileage was owned and operated by the central and provincial governments. Some had been built by the government for strategic or other reasons, and some was taken over because the concessionary companies were at the end of their financial resources. In order to attract investors, the government had granted interest guarantees payable in gold. The depreciation of the currency after the overthrow of the monarchy increased the burden of these payments and led the government to buy out the roads enjoying an interest guarantee. As a result the government became owner of 60 per cent of the mileage existing during the first years of the present century. However, the government adopted the policy at that time of renting the roads thus purchased to private companies.[1]

Nationalization of foreign-owned railways as a matter of deliberate policy was introduced by President Vargas. During his regime the British-owned São Paulo–Paraná Railway and the short Guaíra–Pôrto Mendes line (now the Mate Laranjeira) were taken over, and provision was made for the liquidation of the French interest in Brazilian railways. In 1946 the ninety-year-old British concession of the São Paulo Railway was terminated, subject to indemnity in accordance with the contract. On June 17, 1948 the São Paulo State government took over control of the Bragantina Railway, a former branch of the old São Paulo Railway, which was not included in the nationalization of the latter road. The purchase price was reported to be Cr. 13 million ($650,000).

1. Julian Smith Duncan, *Public and Private Operation of Railways in Brazil,* Columbia University Press, New York, 1932.

At present the federal government owns 66.7 per cent of total railway trackage, the state governments 9.6 per cent and private companies 23.7 per cent. Since a number of federally owned railways are leased to states or to private companies, management is as follows: federal government, 41.4 per cent; state governments, 31 per cent; private companies, 26 per cent; and one "mixed company," 1.6 per cent. Some of the federally operated railways are administered by the Railway Department. Others are *autarquias,* or autonomous bodies somewhat similar to government-owned operations in the United States, a form of organization more fully described on pages 272-74. Railways operated in these various ways are as follows:

	Per Cent of Total Mileage
Operated by federal government	41.4
Autarchies (Central, Noroeste, Paraná–Santa Catarina, and Mate Laranjeira)	
Administered by National Railway Department (ten lines including the Leste Brasileiro, the principal railways in the north and northeast (except the Great Western) and the Goiás Railway)	
Santos-Jundiaí Railway (the former São Paulo Railway, now under special regime)	
State administered (Rêde Mineira network, Rio Grande do Sul railways, Santa Catarina railways, the Sorocabana and Araraquara in São Paulo and eight smaller lines)	31.0
Privately operated (Paulista, Mogiana, Mossoró, Great Western, Ilhéus a Conquista, Leopoldina and eleven short lines or industrial railways)	26.0
Vitória a Minas Railway (controlled by a "mixed company")	1.6
	100.0

Further Nationalization Likely

Rising operating costs, competition from motor and air transport and the difficulty of raising new capital have created an atmosphere favorable to the nationalization of other privately owned companies, both foreign and Brazilian. At the time of the arrival of a British financial mission in Rio de Janeiro, in March 1948, to discuss Brazilian frozen credits in London, it was reported that the future of the remaining British interests in Brazilian railways would be discussed. These interests are the Great Western Railway, a federally owned railway rented to the British company that holds the debentures; the Leopoldina, British owned and operated; and the Ilhéus a Conquista, a British-owned railway holding a concession from the state of Bahia. In recent years these lines have had difficulty in meeting the full service on their invested capital.

Special interest attaches to the project for the expropriation of the Mogiana Railway, privately owned in Brazil, submitted to the state assembly of São Paulo by the governor of the state late in 1947. This line played an important part in the development of one of the richest coffee zones in Brazil, in opening up the western triangle of Minas Gerais and in establishing rail connections with the state of Goiás.

With the decline of the coffee zones and the depreciation of the Brazilian currency, the Mogiana found difficulty in maintaining service on a sterling debt contracted in 1911. In 1941 an agreement was reached with the British creditors for a reduction of the debt and refinancing in cruzeiros. As the result of this and other measures, the financial position was improved. For some years prior to 1948 the company succeeded in paying annual dividends of 7 per cent on subscribed capital. At the same time further reorganization and re-equipment are required, and heavy obligations have been incurred in connection with modernization programs already in progress.

The governor of São Paulo justified his proposal on the

grounds of the advantages to be derived from the incorporation of the Mogiana with the net of state-owned railways, the Sorocabana, the São Paulo–Minas and the Araraquara, all one-meter-gauge lines. The Mogiana connects with the first two. The message also stated that "in the present conditions of the financial markets in Brazil, and probably for a long time in the future, there is no possibility of counting on the favor of the public in the investment of its savings in railways."

Growing Deficits

The financial condition of the railways, long a matter of concern to the government and the public, has been aggravated by increased costs of personnel and materials. Most of the lines have an operating deficit, without consideration for depreciation or return on the invested capital. Only one company, the Paulista, is fully paying its way without financial aid from state or federal government. Another privately owned line, the Mogiana, has been paying dividends for several years, but the management is so concerned about the outlook that it is ready to turn its burden over to the state.

The forty-seven railways in Brazil received Cr. 3,650 million in operating revenues in 1946 and paid out Cr. 3,919 million as operating expenses, leaving a deficit of Cr. 269 million ($13.5 million) to be met by the federal Treasury. In addition the federal government and some of the states make annual appropriations to take care of new construction, rehabilitation and purchases of equipment.

In 1945 two taxes of 10 per cent each were established on freight charges, the money collected to be placed in a special fund to be used by the railways, subject to official approval, (1) for the renovation of fixed installations and rolling stock and (2) for improvement of roadbeds and new constructions. The funds may also be used as the basis of credit operations. These taxes yield about Cr. 600 million ($30 million) a year.

In the aggregate, about Cr. 1,000 million ($50 million) of public money are spent annually on the railways.

The financial results of the railways in 1946, classified by the nature of the administration, were as follows (in millions of cruzeiros):

	Deficit (—) *or Surplus* (+)	
Operated by federal government		
"Autarchies" or autonomous administration	—130.7	
Administered by National Railway Department, supported by federal appropriation	—186.9	
Santos-Jundiaí Railway	+21.9	
State administered	—74.9	
Privately operated	+98.1	
Vitória a Minas Railway	+2.7	
	—269.8	(—$13.5 million)

Problems of Traction, Gauge and Fuel

According to studies made in 1945, of the 2,777 locomotives on the meter and other narrow-gauge lines, 21.8 per cent were more than forty years old, 30.6 per cent were between thirty and forty years old and 14.7 per cent were from twenty to thirty years of age. On the 1.60-meter-gauge lines, 63.2 per cent of the locomotives were considered beyond the limits of efficient service and 34 per cent might properly be classified as scrap. Some purchases since that time have relieved the more difficult situations, but most of the locomotives are still over age and inefficient.

Ninety per cent of Brazil's railway mileage is one-meter gauge, 7 per cent is broad gauge (1.60 meters), and 3 per cent narrow gauge (0.76, 0.66 and 0.60 meters). On some stretches there are three rails, forming two gauges. None of the lines uses the standard gauge of 1.44 meters (4 feet 8.5 inches) that prevails in the United States, the United Kingdom and other countries that are the leading manufacturers

and exporters of railway equipment. The use of nonstandard gauges has always involved substantial additional cost to Brazilian railways in connection with purchases of car wheels and rolling stock, although one or two of the principal lines have worked out procedures for using United States standard equipment.

The use of broad gauge is confined to the main lines of the Central of Brazil (federal), the Paulista (private) and the Santos-Jundiaí, former São Paulo Railway (federal). As these lines also have considerable meter-gauge mileage, as well as short extensions of 0.60-meter gauge, and make connection with other lines using all meter gauge, passenger and freight cars can operate only within a limited radius, resulting in costly and wasteful changes, as well as preventing the most efficient utilization of equipment.

Fuel is a serious problem. Fuel costs amount to 25 per cent of total operating expenses as compared with about 7.5 per cent in the United States. The principal fuel used is coal, mostly imported. Wood is the main fuel in the interior sections of the country, however. During the last decade between 30 and 40 per cent of the total expenditure for fuel has gone for wood. Some of the roads are said to use one third of their ton-mile capacity in hauling their wood fuel supply. Some of the meter-gauge lines will doubtless have to continue to use wood fuel for years to come, but the wood should come from conveniently located plantations in order to reduce haulage and damage to forests.

Electrification Increasing

Sections of the Paulista (private), the Sorocabana (state), the Central (federal) and the Rêde Mineira (state) have been electrified, totaling 575 miles of line and 800 miles of track.[2] The first three lines are extending electrification.

2. In addition, there are electrified short lines like the E. F. Campos do Jordão, a 30-mile line from Pindamonhangaba, a station on the Central Railway, to a summer resort in the Mantiqueira Range and the E. F. Votorantim, 8.7 miles, an industrial road out of São Paulo, and several other short industrial and scenic lines.

The Central expects to complete the electrification of its main line from Rio de Janeiro to Barra do Piraí during 1948. The work of electrifying the suburban lines around Rio and São Paulo is proceeding. The Santos-Jundiaí line (federal) is undertaking the electrification of a thirty-five-mile stretch from Jundiaí to Mooca station. The use of natural gas fuel at Salvador (Bahia) in electrifying the Leste system (federal) has been proposed.

Further electrification of the railways as a means of reducing dependence upon imported fuels is a favorite theme in Brazil, but the experience of the United States and other countries demonstrates that electrification is not economically justified unless traffic is heavy and cheap power is available. In view of the prospects for petroleum development, the further use of Diesel-electric locomotives and other recently developed types would appear to be preferable, at least on lines technically suitable and operating out of ports where fuel oil is obtainable at reasonable cost. During and since the war Diesel-electrics have been purchased by the Central (federal), the Sorocabana (state), the Paraná–Santa Catarina (federal) and the Cearense (federal).

Transport Plans

The basic transportation plan now in force is the one issued by Vargas in 1934, which relates primarily to rails and secondarily to waterways and highways. It is dominated by strategic considerations, but also has basic economic considerations.

The railway section of this plan provides for four north-south trunk lines: (1) Santarém due south to the Paraguayan border at Ponta Porã, (2) Belém southward to a connection with a navigable stretch of the Tocantins River and thence to Pirapora, present railhead on the upper São Francisco, (3) lines from several northern ports converging at Petrolina (opposite Juázeiro) on the middle São Francisco

and (4) a coastal line from Natal to Rio de Janeiro.[3] The main east-west lines involve extensions of existing lines radiating from Rio de Janeiro, one through Minas Gerais to Anápolis (Goiás) and to Cuiabá, and thence northwestward on a line about two hundred kilometers from the Bolivian and Peruvian frontiers to Cruzeiro do Sul, near the extreme western point of Brazil; second, an extension of the Noroeste to the Bolivian border at Corumbá (now practically completed), and eventually to the Pacific port of Arica; and third, an extension of the old São Paulo–Paraná Railway to the Paraná River at Guaíra.

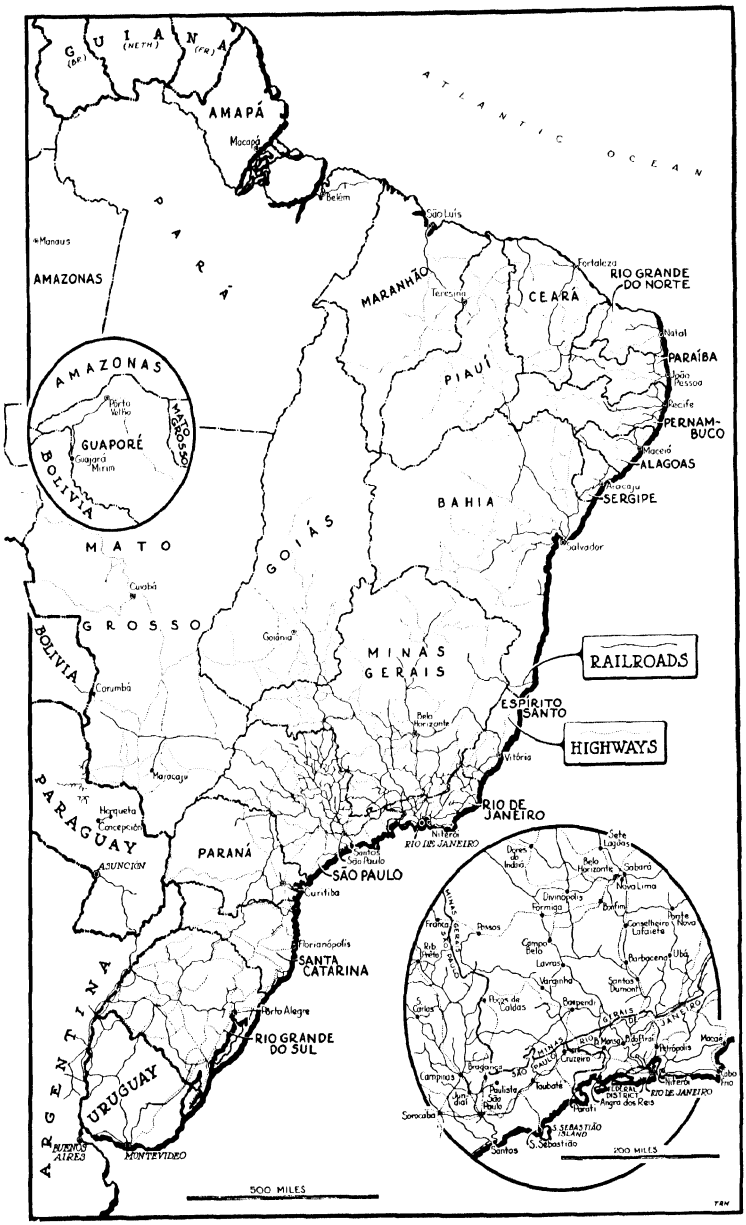
In subsequent years work was begun on some parts of this plan, notably the linking up of the various lines in northeastern Brazil and their connection with the railways of central Brazil; also the extensions in Mato Grosso and Paraná.[4]

Early in 1946 the government approved a so-called re-equipment plan, which related primarily to the financing of purchases of badly needed rolling stock and reconstructions of roadbeds and track layouts, but also provided for some new construction, principally a new and more direct line from São Paulo to the southern states, ending at Rio Grande. Some work has already been done on some sections of this route.

About the same time a commission was named to revise the 1934 plan. Its report was submitted early in 1948 but has not yet been given the force of law nor been published in detail. Summaries published by the press indicate that it more clearly defines the proper fields for railways and highways. It endorses the railway extensions and interconnections already initiated and calls for standardization of the 1.60

3. In view of the formidable topographic obstacles on these routes, as well as the low population density, these projects will only be of academic interest for many years to come.

4. A total of 1,356 kilometers (841 miles) had been completed up to the end of 1945.


GUIANA (NETH.) (FR.) (BR.)
AMAPÁ
Macapá
ATLANTIC OCEAN
Belém
São Luís
Manaus
AMAZONAS
PARÁ
MARANHÃO
Teresina
CEARÁ
Fortaleza
RIO GRANDE DO NORTE
Natal
PARAÍBA
João Pessoa
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ALAGOAS
Aracaju
SERGIPE
PIAUÍ
BAHIA
Salvador
AMAZONAS
MATO GROSSO
Pôrto Velho
GUAPORÉ
Guajará Mirim
BOLIVIA
GOIÁS
Cuyabá
MATO GROSSO
Goiânia
MINAS GERAIS
Belo Horizonte
ESPIRITO SANTO
Vitória
RAILROADS
HIGHWAYS
BOLIVIA
Corumbá
Araçatuba
PARAGUAY
Marqueta
Concepción
ASUNCION
PARANÁ
RIO DE JANEIRO
Niterói
RIO DE JANEIRO
Santos
São Paulo
SÃO PAULO
Curitiba
Florianópolis
SANTA CATARINA
Pôrto Alegre
RIO GRANDE DO SUL
ARGENTINA
URUGUAY
BUENOS AIRES
MONTEVIDEO
500 MILES
Sete Lagôas
Divinópolis
Formiga
Barbacena
Ubá
Juiz de Fora
Petrópolis
Campinas
Sorocaba
Santos
S. Sebastião
S. SEBASTIÃO ISLAND
200 MILES
TRN

meter throughout the country but with standard-gauge equipment.

Despite the ambitious railway plans of the Vargas era, especially the launching of international connections, little was done to correct the basic deficiencies of the existing roads, which entered the war with depleted and antiquated equipment. Some new equipment was obtained during the war years, but the general situation deteriorated further. The railways on the whole achieved a commendable performance during the war, considering the difficulties. From 1935 to 1945 ton-kilometers increased 102 per cent and passenger-kilometers 122 per cent, although there was only a 10 per cent increase in the number of passenger cars, a 23 per cent increase in the number of freight cars and an 8 per cent increase in locomotives.[5]

Five-Year Program of Rehabilitation

In the latter part of 1947 the Ministry of Transport prepared a new survey of railway needs as a part of President Dutra's five-year program of economic reconstruction. According to this study, track and rolling stock needs of existing lines amounted to about $238 million. About $227 million of new construction and reconstruction was proposed, including north-south connections, connecting links from center to west and south, building of relocated sections and electrification of one-meter-gauge lines. The total cost of the five-year program was estimated at nearly $466 million. (See Table 11.) It is estimated that approximately half of the outlay would have to be in foreign currencies for imported materials and equipment.

National Railway Fund Proposed

The program outlined above includes the needs of the privately owned railways and the autonomous federal roads as well as those administered through the National Railway

5. Statement of Dr. Clovis Pestana, Minister of Transport and Public Works, published in *Jornal do Commercio,* Rio de Janeiro, February 17, 1948.

Department. Only the private Paulista Railway and possibly one or two others are in a position to look after themselves; the others need the assistance of the government either in the form of appropriations or as intermediary and guarantor of foreign loans. Some observers believe that all lines will come into the hands of the government within a decade. This may well be, but such an eventuality will not necessarily solve the basic problem, which is to convert the railways into assets rather than liabilities. At the time the São Paulo Railway was taken over in 1946, the Paulista company, it was reported, was interested in combining the two lines, which meet at Jundiaí, and possibly also bringing the Mogiana into the combination. In view of the Paulista's record of able and public-spirited management, such an arrangement has much to commend it. The Sorocabana, the principal railway owned by São Paulo State, has another entry into Santos, which ensures useful competition.

A proposal for the creation of a national railway fund, similar to the National Highway Fund, has been submitted to Congress by Deputy Israel Pinheiro of Minas Gerais. The revenues would be derived from the 8 per cent tax on minerals and electric energy, from the 10 per cent railway improvement tax and from a portion of the revenues from the tax on liquid fuels and lubricants, now reserved entirely for highway construction. This fund would be used as the basis for three types of credit operations: (1) issue of 7 per cent railway bonds, to be redeemed at the annual rate of 10 per cent of the values in circulation; (2) placing of foreign loans for purchase of imported materials; and (3) giving the guarantee of the federal government to credit operations by private companies. Credit operations would be limited to Cr. 7,000 million ($350 million).

Responsible officials are convinced, in theory, of the desirability of giving priority to the rehabilitation of existing lines rather than to new construction, but in practice, extensions and connections make important claims on the

TABLE 11

MINISTRY OF TRANSPORT ESTIMATE OF RAILWAY NEEDS OVER FIVE-YEAR PERIOD, 1947

Item	Number	Estimated Cost
		(*Thousands of Dollars*)*
Total	—	465,658
Track and rolling stock	—	238,254
Freight cars	11,794	62,982
Locomotives	414	44,232
Ballasting (*miles of track*)	57,619	19,819
New rails	—	96,744
(*miles of track*)	61,528	—
(*tons of rails*)	754,000	—
Automotive cars	26	2,778
Shops for Ceará, Leste (Bahia), Paraná–Santa Catarina and Rio Grande do Sul lines	—	11,699
	(*Miles*)	
New construction and reconstruction	2,098	227,404
North-south connections	847	36,753
Teresina-Periperi (Piauí)	107	6,998
Campo Maior–Oiticica (Piauí)	112	7,692
Itapipoca-Sobral (Ceará)	60	1,068
Mumbaça-Sousa (Rio Grande do Norte)	57	1,603
Campina Grande–Patos-Pombal (Paraíba)	117	4,808
Alagoa de Baixo–Albuquerque, Né-Ingazeira (Pernambuco)	45	1,229
Igaci-Colégio (Alagoas)	70	2,137
Itaiba–Mundo Novo (Bahia)	56	1,603
Contendas-Brumado–Monte Azul (Bahia)	223	9,615
Connecting links, center to west and south	1,251	104,807
Itanguá-Garganta, Bom Sucesso–Eng. Bley (São Paulo, Paraná)	177	23,237
Eng. Bley–Bento Gonçalves (Paraná, Sta. Catarina, Rio Gr. do Sul)	373	37,393
Canguçu-Barreto (Rio Grande do Sul)	137	17,094
Apucarana-Guaíra (Paraná)	217	14,156
Leopoldo de Bulhões–Goiânia (Goiás)	53	1,977
Corumbá–Pôrto Esperança (Mato Grosso)	58	1,709
Maracaju–Ponta Porã (Mato Grosso)	189	2,297
Lima Duarte–Bom Jardim (Minas Gerais)	47	6,944

TABLE 11—CONTINUED

Item	Estimated Cost
	(*Thousands of Dollars*)[a]
New construction and reconstruction (*Continued*)	
Relocated sections, to build	45,406
Viação Férrea do Rio Grande do Sul	25,641
Rêde Viação Paraná–Santa Catarina	8,013
Estrada de Ferro Noroeste do Brasil: Mirante to Guaiçara and Lagôa Rica	2,671
Rêde Mineira de Viação: gauge enlargement, from 0.76 meters to 1.00 meter	6,410
Building the section Três Corações–Pôrto Alegre	[b]
Viação Férrea Federal Leste Brasileiro	1,603
Rêde Viação Cearense	1,068
Electrification of 1.00-meter-gauge lines	40,438
Viação Férrea Federal Leste Brasileiro: from Calçada to Alagoinhas and Mapele-Cachoeira–São Félix	3,472
The Leopoldina Railway: suburban lines and Vigário Geral–Inhomirim section	16,079
Goiás Railroad	4,380
Paraná Railroad: Paranaguá-Curitiba and Morretes-Antonina	2,618
São Francisco Railroad: São Francisco to Mafra	3,472
Rêde Mineira de Viação: Belo Horizonte–Divinópolis and Minduri–Ribeirão Vermelho–Lavras to Cruzeiro-Divinópolis–Ribeirão Vermelho	8,013
Santa Catarina Railroad (70.8 miles), including hydroelectric plant	2,404

Source: Statement furnished the author by the Ministry of Transport and Public Works.

a. Converted at the rate of 18.72 cruzeiros to the dollar.

b. Unavailable.

annual appropriations. The memory of the recent war, when submarine activity interrupted coastal shipping, has revived the long-nurtured purpose to connect the north and south by rail. Officials now hope that through connections between Rio and Salvador can be completed by 1949, the four-hundredth anniversary of the founding of the capital of Bahia. Work is also being pushed on some sections of a new trunk line from São Paulo to Pôrto Alegre and the Uruguayan border; present connections are tortuous, slow and inadequate.

International Connections

Attention is being given to international connections by the governments concerned. Proposals include an eventual transcontinental line from Santos to Arica (Chile) on the Pacific Coast. The first link will consist of the Sorocabana Railway from Santos to Baurú (São Paulo), 490 kilometers (304 miles), and the second stage is the Noroeste Railway from Baurú to Corumbá, near the Bolivian border. A bridge has been built across the Paraguay River at Pôrto Esperança (1,273 kilometers, or 791 miles, from Baurú), but some work still remains to be done on the 100 kilometers from that point to Corumbá. About 200 kilometers (124 miles) of the Brazil-Bolivia Railway have been built inside Bolivia. This work is being done by the Brazilian government in accordance with a Brazilian-Bolivian agreement of 1938, whereby the Brazilian government agreed to spend £ 1 million (gold) on a line from Corumbá to Santa Cruz (Bolivia). The Bolivian government undertook to carry forward the construction to tap connections with the Bolivian oil fields. The agreement also provided for joint petroleum exploration work in Bolivia, and permission for Brazilian companies to build pipelines.

A considerable part of the Noroeste Railway needs to be rebuilt, an expensive job in view of the lack of rock, sand or cement along the right of way. On leaving São Paulo State, the Noroeste crosses the southern end of the state of Mato Grosso. About halfway across is the growing city of Campo Grande, from which point a branch line has been constructed southward to Maracaju. This branch is to be continued to Ponta Porã, on the Paraguayan frontier, and eventually to Horqueta (Paraguay), where connection will be made with a short line to Concepción, the leading city in northern Paraguay. Another Paraguayan connection will be provided by a 350-kilometer (217-mile) extension of the old São Paulo–Paraná Railway from the present terminus at Apucarana to Guaíra, on the Paraná River.

Rio Grande do Sul railways reach the Uruguayan border at four points: Jaguarão, Livramento, Quaraí and Quaraim. International service was revived in 1942, but in practice, owing to different gauges, trains stop at the border, and there is no exchange of rolling stock. An international bridge across the Uruguay River connects Uruguaiana (Brazil) and Paso de los Libres (Argentina).

Central do Brasil

Brazil's principal railway system in volume of traffic is the Central do Brasil, which connects Rio de Janeiro with São Paulo and Belo Horizonte and will eventually provide the connecting link with the northeast. It has 2,400 miles of line, of which 884 are broad gauge, 1,420 are meter gauge and slightly under a hundred miles are three-rail track on which both broad-gauge and narrow-gauge trains can run. There are 225 miles of double track and 62 miles of multiple track. Within recent years, a large part of the main line to Belo Horizonte and the branch from Barra do Piraí to São Paulo have been rebuilt. Grades were reduced and the minimum curve radius increased. With the completion of the relocation of the São Paulo line, possibly in 1949, the running time between Brazil's two largest cities will be cut from twelve hours to about seven hours. The Central has been carrying about 5 million tons of freight a year; the capacity is expected to be increased by 40 to 50 per cent upon completion of the present changes and the acquisition of the ordered equipment. A number of new Diesel-electric and electric locomotives and sixty-three new steel passenger cars (Budd) have been purchased. A modern signaling system has been installed on its principal sections.

The Central has been a federally owned "autarchy" since 1941. The general flexibility of management which that status affords has doubtless made possible the progress achieved in making improvements. At the same time the line is heavily handicapped by excessive personnel. The road has

operated at a loss for many years, with few exceptions. Like other federal and state-owned roads, the Central has to operate extensive mileage through territory where traffic is extremely light.

Need for Long-Range Program

Railway freight rates in Brazil are high, averaging twice as much as in the United States or more. Passenger rates are much lower than in the United States. Railways carry mail, including parcel post, free.

After a period of relative neglect, the railways are receiving active and intelligent attention. Brazil wants to obtain external financing for part or all of the materials which must be purchased abroad in connection with the reconstruction and extension of its lines. The government is giving consideration to the possibility of encouraging foreign private investment for part of the program, but most of the requirements will probably have to be handled by United States or international agencies. The moment appears opportune for a long-range program, worked out by joint consultation and taking into consideration not only the needs of the railways but also the place of other forms of transport and economic development possibilities. If a basis can be found for consistent aid and collaboration over a period of years, the total amount of foreign public financing required may be found to be comparatively small.

Pipelines

The construction of a pipeline system from Santos to São Paulo has been authorized by the federal government, but no provision has yet been made for financing it. By Resolution No. 7 of August 17, 1948, the National Petroleum Council authorized the Santos-Jundiaí Railway to build and operate the line. In a report prepared earlier in the year for the Brazilian government, William G. Heltzel, of Tulsa, Oklahoma, recommended that two lines be built, one a ten-

inch line for "white" or refined products and the other an eighteen-inch line for "black" or heavier products. The cost was estimated at $6 million. The SALTE plan [6] (Transport section, item VII) calls for the construction of the pipeline and suggests an allocation of Cr. 113 million (approximately $6 million) in the regular budget.

Highways

Brazil has only a thousand miles or so of paved highways. The most important of these are the Rio-Petrópolis (45 miles), Santos–São Paulo (40 miles), São Paulo–Jundiaí (41 miles), sections of the Rio–São Paulo highway and short stretches leading out of other principal cities, usually to an airport. The state of São Paulo has 650 miles of paved highway, 3,750 miles of macadam and an estimated 18,000 miles of dirt roads. Some of the dirt and macadam roads were built by railways or private companies in opening up new sections of the state. A fair system of dirt roads has been constructed in the northeastern states by the federal government as a part of its drought relief measures (Inspetoria Federal de Obras Contra as Sêcas).

The total number of motor vehicles in Brazil as of June 1948 was 290,211, of which 150,307 were passenger cars (116,322 private and 33,985 taxis), 130,111 trucks and 9,793 buses. In addition, there were 16,291 motorcycles and 6,769 tractors. Imports of motor vehicles increased sharply in 1947, amounting to 27,505 passenger cars and 36,130 trucks, but have since slowed down owing to exchange restrictions.

The Highway Program

Highway construction got off to a good start in the 1920's but languished during the Vargas era from 1930 to 1945. A new beginning has now been made that gives promise of important results. The legal basis of the present revival is

6. See Chapter 13.

Decree-Law No. 8463 of December 27, 1945, which created a National Highway Fund, reorganized the National Highway Department and set up a highway council to supervise the program.

The revenues are derived from the taxes on liquid mineral combustibles and lubricants, whether imported or produced locally. Forty per cent of the product of the tax goes to the federal highway department; 60 per cent is transferred to the states, the Federal District and the territories, subject to certain conditions, such as the organization by the states of approved plans and administrative machinery and the contribution by the states of appropriate sums from their budgets for highway work. In addition, Congress makes provision in the annual budget for additional construction not included in the National Highway Fund program. According to the President's message to Congress on March 15, 1948, the total revenues of the National Highway Department in 1947 amounted to Cr. 834 million ($41.7 million), of which Cr. 453.8 million ($22.7 million) was turned over to the states and territories. For 1949 the revenues are estimated at Cr. 1,341.6 million ($67 million).

The basic features of the present highway program were established by the national highway plan of 1944, which called for a number of trunk lines, transversals and interconnections. Standards were set up by Decree-Law No. 8463, which called for the completion of the following roads during the first five-year period:

Rio–Pôrto Alegre, including the rebuilding of the Rio–São Paulo highway, construction of a new Curitiba-Lajes road and improvement of the Lajes-Vacaria stretch

Rio-Bahia, including the rebuilding of the Rio-Petrópolis road

Rio–Belo Horizonte (via Petrópolis)

Pôrto Alegre–Uruguaiana, establishing international connections with Uruguay

Paranaguá-Curitiba–Foz do Iguaçu, across the state of Paraná from the Atlantic Coast to the famous Iguaçu falls

Belo Horizonte–São Paulo

Progress of the Program

At present, facilities are being concentrated on the Rio–São Paulo, the Curitiba-Lajes and the Rio-Bahia routes. The completion of these sections will provide through routes from the northeastern states to Pôrto Alegre in the south. The national department is also doing some work on a number of other roads in various states, in accordance with congressional appropriations. The state administrations are devoting their allocations partly to cooperation with the federal authorities and partly to roads of local interest.

Progress is hampered both by shortage of labor and by shortage of equipment, which would economize labor, as well as of cement. Foreign technical assistance combined with road-building machinery and materials, which might require external financing, would greatly aid Brazil's development and also yield returns to United States interests. In view of United States pre-eminence in highway construction and motor car manufacture, Brazil naturally looks to the United States for assistance in this matter.

The Highway Department budget for 1948-1953 calls for expenditures totaling approximately Cr. 3,000 million ($150 million), of which Cr. 1,200 million ($60 million) would be for imported machinery, petroleum products and cement. Brazilian officials are interested in obtaining financing for that part of the program involving expenditures in dollars. A larger program for a six-to-eight-year period, covering both federal and state highways, calls for expenditures of $200 million in imported equipment and supplies and payment of foreign engineering services. Some of the leading personalities connected with the program have suggested that details of the highway program be made subject to

approval by a joint Brazilian–United States commission; that service on the loan be assured by requiring deposit in the Banco do Brasil of the necessary amounts payable under the National Highway Fund, and that guarantee of priority be given in connection with exchange remittances.

Various local and foreign interests have attempted to interest state and federal officials in proposals to build toll roads. A few stretches of toll roads and bridges now exist, but the official policy is unfavorable to development along those lines.

Commercial truck and bus operations are expanding. Some large companies operate their own truck lines for delivery within a considerable area, rather than rely on slow and uncertain railway and coastwise shipping services. As most of the roads are poorly maintained, the life of a bus or truck is short.

Passenger bus transport lines operate under concession granted by the National Highway Department, which also establishes rate schedules varying with the type of vehicle and road construction. Truck operators are not regulated nor are there any established freight rates.

Shipping

In 1946 Brazil's international trade movement amounted to 3.7 million tons of exports and 5 million tons of imports, or 8.7 million in all. The coastwise cargo handled that year totaled 4 million tons.

Eighty-five per cent of the imports and 56 per cent of the exports pass through two ports, Rio de Janeiro and Santos. Rio de Janeiro is the most important from the standpoint of imports, while Santos leads in exports. Recife, Salvador and Pôrto Alegre are the only other ports handling over 100,000 tons of imports annually. Rio Grande, São Francisco (Santa Catarina) and Vitória surpass the 100,000-ton mark in exports.

Of Brazil's coastwise traffic of 4 million tons in 1946,

TABLE 12

COASTWISE TRADE, BY COMMODITIES, 1946

Commodity	Thousands of Metric Tons	Per Cent of Total
Total	4,051	100
Food	1,810	45
Salt	502	13
Sugar	456	11
Rice	140	4
Flour (all types)	136	3
Coffee	95	2
Beans	86	2
Various	395	10
General cargo	2,241	55
Lumber	521	13
Coal	465	11
Inflammables	276	7
Hardware	143	3
Cotton	114	3
Beverages	109	3
Various	613	15

Source: Relatório, 1946 (mimeographed), Ministério de Viação e Obras Públicas, Comissão de Marinha Mercante.

45 per cent consisted of foodstuffs. The main items are shown in Table 12.

Coastwise Carriers

The Lloyd Brasileiro, a government-owned company and the principal shipping organization in Brazil, carried one fourth of the coastwise tonnage in 1946. The Cia. Comércio e Navegação, the leading private company, was in second place with 18 per cent. Two other official companies, Cia. Nacional de Navegação Costeira and the Cia. Siderúrgica Nacional, were in third and fourth place, with 23 per cent. Smaller private companies operating in the coastwise trade were Empresa Internacional Transportes, Carlos Hoepcke, S. A., and the Sociedade Paulista de Navegação Matarazzo, Ltda.

Passengers carried in coastwise trade totaled 156,139 in 1946.

The Lloyd Brasileiro was originally organized early in 1890, soon after Brazil became a republic, as a subsidized corporation merging the various coasting lines of steamers operating at that time. It has gone through several changes in organization. In 1937 the government took over all assets and liabilities of the company, of which it already owned most of the stock, and has since administered it as a so-called "autarchy," or semiautonomous organization. It receives an annual subsidy of Cr. 40 million ($2 million). It is required to carry the mails free and to grant a 30 per cent reduction on government freight and passengers.

The Lloyd Brasileiro operates coasting, river and international services. It has maintained regular service with the United States since 1906.

At the end of the second world war the Lloyd had a fleet of sixty-nine ships of 262,000 tons. It has since purchased twelve surplus freighters of 5,855 dead-weight tons each from the United States Maritime Commission, and has received part of two special orders for twenty ships of 7,500 tons each placed in the United States and Canada. Six of these were ordered from Canadian Vickers, Ltd., and fourteen from Ingalls Shipbuilding Corporation of Pascagoula, Mississippi. Brazil received a credit of $38 million from the Export-Import Bank of Washington in connection with the last-mentioned contract. When delivery is completed, the Lloyd will have a fleet of 105 vessels of 516,000 tons.

The Cia. Siderúrgica Nacional (National Steel Company) has a fleet of cargo vessels engaged primarily in freighting coal from Santa Catarina ports to Rio de Janeiro for rail shipment to Volta Redonda. In 1947 the line transported 290,000 tons of coal and 15,000 tons of general cargo.

River Transport

After long neglect, river transportation is again coming in for serious consideration. Brazil has over 25,000 miles of navigable rivers, of which about 15,000 miles are in the

Amazon basin. Foreign-flag vessels operate regularly on the Amazon as far as Manaus, and also on the Paraguay to Corumbá. In 1946 Brazilian companies transported 706,000 tons on rivers and lakes, and also 128,000 passengers.

The larger part of the cargo is handled by private, non-subsidized companies. The federal government subsidizes eleven companies operating on the Amazon and its tributaries, on the Araguaia and the Tocantins, on the Itapecuru (in the state of Maranhão), on the São Francisco and the Rio Doce. In addition, a number of states grant subsidies, for example the state of Minas Gerais to the Cia. Navegação Mineira do São Francisco, with headquarters at Pirapora. The state of Rio Grande do Sul bought two British LCT's in 1947 for operation in the shallow waters of the Lagôa dos Patos between Pôrto Alegre and Rio Grande.

The principal federally controlled river service is the Serviço de Navegação e de Administração do Pôrto do Pará (SNAPP), which was formed in 1940 to take over the Amazon River Steam Navigation Company and the port of Pará. It receives an annual subsidy of Cr. 7 million ($350,000). This operation leaves much to be desired, although there are signs of improvement under the present administration. An effort is now being made to recondition some of the vessels and fit them with Diesel engines. The company is also building four river tugs and some barges.

The Paraná and the Paraguay rivers are of great potential importance. The government subsidizes the Serviço de Navegação da Bacia do Prata, but in practice this is a meager operation, which cannot compete with Argentine vessels. Herva mate, logs and lumber are the principal export products moving down the Paraná River to the Argentine and Uruguayan markets. Exportation of pine logs is prohibited, but in practice logs frequently "break away" from booms on Brazilian tributaries and are reassembled outside the jurisdiction of the Brazilian authorities. Hardwood logs and pine

boards from the states of Santa Catarina and Rio Grande do Sul are rafted down the Uruguay River.

Plans for improvement of river services must be worked out carefully in conjunction with specific development projects that will provide cargo. Some improvements can be made with relatively small amounts of money (although current appropriations are usually so dispersed that little is accomplished on any one job), but more ambitious projects would probably have to be related to plans involving mineral exports or to power, irrigation, reclamation and fisheries development.

Shipping Controls and Aids

The Constitution of 1946 provides that coastwise navigation for the transport of goods is the exclusive prerogative of national ships, except in cases of public necessity, and that the owners, charterers and commanders of national ships, as well as at least two thirds of their crews, must be Brazilians (Article 155). Decree-Law No. 2784 of November 20, 1940, based on Article 149 of the 1937 Constitution, provided that ships are considered national if they are the property of native-born Brazilians or if they belong to companies organized in Brazil and more than half of the capital belongs to native-born Brazilians.

Shipping matters are controlled by the Merchant Marine Commission (Comissão de Marinha Mercante), established on March 7, 1941. The three commissioners are appointed by the President of Brazil. Some acts of the commission pass through the Ministry of Transport and Public Works. Former overlapping functions of the commission and the Ministry's Department of Ports, Rivers and Canals were segregated in 1946. Routes, rates and subsidies are determined by the commission. Aggregate subsidy payments in 1946 amounted to Cr. 63.8 million ($3.2 million).

The federal government also subsidizes institutions for training sailors. The Lloyd Brasileiro operates a school for

pilots, engineers and other technicians, and the navy qualifies members for service with the merchant marine.

Shipbuilding in Brazil is limited to Diesel-sail fishing boats and coastal luggers, usually of 100 to 200 gross tons. Repairs are made by shipyards at Rio de Janeiro. The navy yard at Ilha das Cobras, in Guanabara Bay, and the Costeira yards on near-by Ilha do Viana have been assembling and building destroyers and subchasers. SNAPP started work on a graving dry dock at Belém but funds were exhausted after expenditure of approximately $2.5 million.

Harbor and Dock Improvements

Since 1944 the Ministry of Transport has drawn up plans for improvement, dredging and re-equipping Brazilian harbors. The needs have been estimated on the basis of the average merchandise tonnage during the years 1936-1946, plus 20 per cent. Two decrees have been issued as the basis for financing: Decree-Law No. 8311 of December 16, 1945, which imposed a 5-cruzeiro tax ($.25) on each ton of merchandise loaded or unloaded, the income to be devoted to interest and amortization charges on credit operations which the port authorities or concessionaires may effect; and Decree-Law No. 9681 of August 30, 1946, providing for the issuance of port obligations by the "autarchies" or concessionaires.

A plan for enlargement of Santos dock facilities was approved by the Brazilian government in August 1945, and work has been progressing. According to the President's 1948 message to Congress, the Santos improvement program will cost $24.5 million and "should be implemented by the end of 1950."

The federal government is proceeding with plans for improvement of the port of Rio de Janeiro, which is owned by the government and operated by a port superintendent who reports to the Minister of Public Works. Work has begun on the construction of 1,330 meters of docks in addition to the existing 4,725 meters. Five hundred meters of the new

docks will be used for installations of the petroleum companies, which are contributing $2.1 million or more toward the financing of the works. The National Salt Institute and the National Pine Institute are also assisting. The War Ministry will occupy eighty meters of the new docks. A new pier at Praça Mauá for large passenger vessels is also projected. Requests for bids for additional gantry cranes for the Rio ports were issued in September 1947.

At that time bids were also called for on the dredging of sixteen principal ports and the internal canals of Lagôa dos Patos.

Although work has not been entirely completed on the Mucuripe port and pier at Fortaleza, partial use is being made of it.

The ports of Rio de Janeiro and Santos were seriously congested at the height of the import boom in 1946 and 1947. The difficulties were partly due to inadequate facilities, but even more to human factors and to the practice of leaving goods in the port warehouses, where storage rates are low. Steps taken by the authorities at Rio, together with a declining volume of imports, resulted in the achievement of fairly satisfactory conditions by the end of 1947.

Interstate Shipping a First Need

The delivery of the new ships that have been purchased and the steps taken to improve harbors and dock facilities constitute a beginning of a shipping service more in keeping with the needs of commerce along Brazil's extensive waterways. However, much remains to be done before these services can sufficiently stimulate production and interchange of goods between different parts of the country. Delays, high charges and interest rates, vexatious taxes, and losses from pilferage and damage, remain serious handicaps to interstate traffic.

The Lloyd Brasileiro desires, as its next step, to acquire small passenger ships with facilities for handling some

light cargo for coastwise service and joint cargo-passenger vessels for its international service. Additional tugboats and lighters are needed to expedite loading and unloading operations in those ports where ships cannot tie up at docks. Improvement of the coastwise services appears clearly desirable, but expansion of the international shipping services seems more questionable in the light of the company's limited resources and heavy existing commitments. The possibility of developing a big international merchant fleet, on a sound and economical basis, is limited in a country with large undeveloped internal resources, a shortage of manpower and capital, and limited metallurgical industries and skills. Certainly improvement of the transport problem at home should come first.

Civil Aviation

Brazil has the most extensive commercial air transport system in Latin America. The size and position of the country, the inadequacy of surface transport, the "air-mindedness" of the Brazilian people and government and the technical and financial assistance of the United States, all have contributed to this result.

In spite of Brazil's relatively advanced position in air transportation, the industry still faces serious financial and technical problems.

Civil aviation comes under the jurisdiction of the Air Ministry, to which it was transferred in 1941 from the Ministry of Transport. The Bureau of Civil Aeronautics regulates civil air activities in general. In addition, the Bureau of Air Routes has charge of airways, airports and safety regulation, and the director of supply inspects aircraft, investigates accidents and issues licenses to airmen.

The total budget of the Air Ministry for 1948 is fairly high in relation to the total budget of the federal government—Cr. 1,298 million (about $65 million) out of Cr. 14,596 million (about $730 million). However, expenditures on civil aeronautics are only a small part of this total.

Lax Regulation

Until recently the government's civil air policy was characterized by an attitude of almost complete laissez faire. Anyone was free to operate an airline anywhere. Since 1946, however, a beginning has been made toward allocating routes and standardizing rates, to prevent excessive competition. The government has made contracts with various airlines, stipulating certain minimum requirements with regard to frequency of service, aircraft and other conditions. Without a contract, no airline can operate a recognized scheduled service. However, several companies do in fact operate more or less on schedule without contracts.

The government issued a uniform schedule of rates in 1947, but it was not generally observed nor enforced. Consequently there was much rate cutting and a series of almost continuous rate wars has had an adverse effect on the financial stability of the industry.

In 1946 the Air Ministry issued a regulation prohibiting the organization of new airlines with a paid-in capital of less than Cr. 50 million ($2.5 million). This virtually brought a halt to the establishment of new companies but it did not affect the numerous small concerns which came into existence in 1944, 1945 and 1946.

The government does not operate any commercial air service, but the FAB (Força Aérea Brasileira) does operate an extensive airmail and military transport service using thirty-eight C-47's. The primary aim of this service, known as the Correio Aéreo Nacional, is officially stated to be the training of FAB pilots. Civilian passengers are frequently carried gratis, to the annoyance of the commercial carriers.[7]

In the international sphere, Brazil has followed the principles of the "five freedoms" of the air, and has negotiated bilateral agreements incorporating these principles with a number of countries.

7. In 1947 CAN operated over approximately 20,000 unduplicated route miles and carried 21,230 passengers, 169 tons of mail and 1,377 tons of freight.

Great Expansion in Airlines

In recent years commercial airlines in Brazil have greatly expanded their operations. In 1940, for example, there were four airlines in Brazil. One was American controlled; the other three were German controlled or influenced. They had flown a total of 3.3 million miles and 25.9 million passenger-miles. By 1947 there were ten scheduled airlines, eight nonscheduled or semischeduled and twelve taxi or charter services or airlines in the process of organization. They flew approximately 26 million miles and 326 million passenger-miles, representing increases of about 688 per cent and 1,159 per cent, respectively, over 1940.

The four airlines which existed prior to 1940—Panair do Brasil, Cruzeiro do Sul (formerly Condor), VARIG (Viação Aérea Riograndense) and VASP (Viação Aérea São Paulo)—are still among the leading air carriers of Brazil. All were developed by foreign interests, but are now owned by Brazilian nationals, 100 per cent in the case of the three ex-German companies, and 52 per cent in the case of Panair do Brasil.

Panair do Brasil and Cruzeiro do Sul are the two most important airlines in Brazil. They are about equal in size and together they carry over 50 per cent of the total traffic. In 1946 Panair and Cruzeiro carried an almost equal volume of traffic, but in 1947 (January-June) Panair, following the inauguration of services to Europe with five Lockheed Constellations, carried almost 50 per cent more traffic than Cruzeiro. The other two of the original four companies are regional operators, VARIG in Rio Grande do Sul and VASP in São Paulo and from São Paulo to Rio de Janeiro.

Increasing Brazilian Control

Panair was financed entirely by American interests until a minority interest in 1943 and a majority interest in 1947 were sold to Brazilian nationals by Pan American Airways. Panair has in recent years obtained loans totaling some $30 million from the Export-Import Bank of Washington.

Cruzeiro was originally financed by the German government through Deutsche Lufthansa. When it was expropriated in 1942, its shares were turned over to Brazilian nationals. However, the shares were of only nominal value, and the assets of the company were represented by a debt of $2.7 million, first to Deutsche Lufthansa and later to the Brazilian government. Since 1942 the company has obtained its capital requirements from loans aggregating approximately $900,000 from the RFC and loans totaling about $3 million from the Bank of Brazil. The equity capital of the company [8] was increased to $1 million through sales of shares to employees and stockholders, but not all of the shares are fully paid up.

VASP was for several years controlled by the state and city of São Paulo, but in 1947 came under the control of private Brazilian interests. VARIG is controlled by the São Paulo state and city government. Early in 1949 it obtained control of Aerovias Brasil.

With one exception, all the new airlines which have come into existence since 1940 were organized and financed by Brazilian capitalists, who were influenced by the availability of United States war surplus planes at low prices. The one company organized by foreign interests was Aerovias Brasil, which until 1947 was 63 per cent controlled by the American-owned TACA airlines (Transportes Aéreos Centro-Americanos, S. A.). TACA's interest was bought out early in 1947 by a group of São Paulo bankers and businessmen. Aerovias Brasil is now the third largest airline in the country.

The first airline to be organized and financed entirely by Brazilian interests was NAB (Navegação Aérea Brasileira), which was established in 1940 by former FAB officers, and began operations in late 1941. This company has always been close to the Air Ministry. It was financed largely

8. Cruzeiro is organized as a limited liability company rather than as a corporation. In Brazil corporations, but not partnerships or limited companies, are required to publish financial statements.

through loans totaling about $2 million from the Brazilian government. It receives the largest subsidy of any Brazilian airline ($400,000 in 1947).

Organized in 1946 by a group of Brazilian capitalists, Real, Transportes Aéreos, S. A., has since become one of the leading airlines in the country.

While much Brazilian capital has been invested in air transportation in recent years, it is now difficult to obtain new capital. With few exceptions, airline operations have been unprofitable. Consequently local investors have lost their earlier enthusiasm for airline securities. Air transportation will probably continue to be an unattractive field for either foreign or domestic capital until the industry is organized on a sound economic basis, with adequate regulation of routes, rates and standards of operation.

Under Brazilian law, all domestic service is reserved to domestic lines. Furthermore, ownership of aircraft and the granting of airline concessions is reserved to Brazilians or to Brazilian juridical persons having legal domicile in Brazil and Brazilian management, on condition that at least a third of the capital belongs to Brazilians domiciled in the country. Only native-born Brazilians may exercise the functions of operating personnel on aircraft operating on domestic routes.

Routes and Traffic

Most of the commercial air routes are concentrated along the coast or in regions within a few hundred miles of the coast. Only Panair do Brasil and Cruzeiro do Sul operate deep into the interior of the country. The most heavily traveled route is, of course, between Rio and São Paulo. Seven companies operate thirty-four round trips daily over this route. In 1947 a total of 26,354 unduplicated route miles were in operation in Brazil. In addition, four Brazilian carriers operate abroad: Panair do Brasil, to Paraguay, Peru, western Europe, Egypt and Turkey; Aerovias Brasil,

to Miami; Cruzeiro do Sul, to Buenos Aires; [9] and VARIG, to Montevideo.

International air services making Brazilian stops include Pan American Airways, British South American Airways, KLM (Royal Dutch Airlines), Scandinavian Airlines System, Air France and FAMA (Flota Aérea Mercante Argentina).

In terms of the volume of flying and air traffic carried, Brazil ranks among the leading nations in the world.[10] In 1946, 48.6 million ton-kilometers of passengers,[11] freight and mail were carried, and in 1947 this total increased approximately 60 per cent. Although this is a small volume in relation to that of the United States, it is higher than that of any other Latin American country and most European countries.

Air traffic in Brazil, as in other countries, is predominantly passenger traffic. Of the 1946 total, passenger traffic represented 82 per cent, freight 16 per cent and mail 2 per cent. The cargo is supplied principally by manufacturers of textiles, pharmaceuticals and specialties who use air transport because of the delays and losses of rail and water shipments. At the present high prices for meat it is worth while for slaughterers in Goiás to send by air to Belém and São Paulo some of the more tender cuts not suitable for curing. The Companhia Itaú de Transportes Aéreos, of São Paulo, with strong financial backing, was organized early in 1948 to operate cargo services. It bought nine war surplus Curtiss Commando planes.

United States Aircraft Prevails

At the end of 1947 there were 225 commercial aircraft registered in Brazil. Of this total, 193 were of United States

9. Cruzeiro is also authorized to operate to New York, but has not yet begun scheduled services.

10. In 1947 Brazil ranked fourth among the nations of the world in miles flown by scheduled airlines, being exceeded only by the United States, the United Kingdom and Australia (USSR not included).

11. Ten passengers with baggage assumed equal to one ton.

manufacture. By contrast, in 1940, there were only 40 commercial planes in Brazil, of which 31 were of German manufacture.

Only two companies, Cruzeiro and Panair, operate four-engined planes. Cruzeiro has three DC-4's and one old Focke-Wulf 200 on domestic runs and the route to Buenos Aires, and Panair operates five Lockheed Constellations to Europe and the Near East. In the fourth quarter of 1946, Panair carried more traffic across the South Atlantic to these areas than all the European airlines combined.

Most of the large number of aircraft imported since 1944 have been United States war surplus C-47's. It was the availability of these planes that enabled many new airlines to organize. Unfortunately, most of these companies were inadequately financed. Consequently they lack facilities for the maintenance of their equipment. Inspection of aircraft is lax. Only Panair, Cruzeiro and one or two other airlines have adequate maintenance and overhaul shops.

Most Lines Unprofitable

Airline tariffs have always been relatively low. Passenger rates average about five cents a mile, or about the same as in the United States, whereas in most Latin American countries rates are 50 per cent to 100 per cent higher than in the United States.

Airline costs in Brazil, as in other Latin American countries, are substantially higher than in the United States. The airlines themselves must maintain their own navigation and communication facilities, which in the United States are furnished by the CAA. Because of low route density, slow maintenance and other factors, aircraft utilization averages less than three hours a day, as contrasted with eight hours a day in the United States. Labor costs are also high, owing to less effective organization of personnel, although wage rates are lower than in the United States.

Only four airlines receive subsidies (for operating certain

uneconomic routes) from the federal government. The subsidies granted from January to November 1947 were as follows (in cruzeiros):

Cruzeiro do Sul	3,672,770	
Panair do Brasil	5,389,136	
VARIG	4,200,000	
NAB	8,000,000	
	21,261,906	(slightly over $1 million)

Approximately Cr. 24 million ($1.2 million) was budgeted for subsidy payments in 1948. In addition to these federal subsidies, a few airlines receive small subsidies from some of the state governments.

In recent years Panair do Brasil has shown adequate profits, partly because of large "joint facility" payments from Pan American Airways. Beginning January 1, 1949 these payments will presumably be reduced. VASP and VARIG, which have concentrated on lucrative short regional routes, have been able to earn fair profits in recent years. Most of the other airlines have incurred heavy losses, depleting their capital.

Air Taxi Services

In addition to the scheduled and nonscheduled airlines, there are a number of so-called air taxi services. These companies operate from metropolitan centers to isolated towns and ranches in the vicinity. They fly small single-engined aircraft and are able to operate into flying fields where the regular airlines could not land. They thus supplement the services of the airlines and perform a useful function for businessmen and landowners who would otherwise take days to reach some points they can fly to in a few minutes.

In September 1947 the Air Minister set up a committee to establish minimum requirements for the operation of such services. Being small organizations, they fly without benefit

of radio or navigation aids. It is not anticipated, however, that any severe requirements will be imposed on them, for such action would prevent their development and expansion, which are recognized as useful to the country.

Private Flying and Aviation Training

Private flying is widely developed and practiced in Brazil, thanks to the aero clubs located throughout the country. For 1948 the government budgeted approximately Cr. 17 million ($850,000) for subsidies to the aero clubs.

At present there are 291 aero clubs in Brazil, of which 206 are authorized to give flying lessons. These clubs have been a major influence in training private pilots of Brazil, who now number over 6,000. Many prominent business and political leaders of Brazil have received flying instruction in the aero clubs, which have contributed greatly to the "air-mindedness" of the Brazilian people and exert considerable political influence in furthering the development of aviation. The clubs are now training some 7,000 persons who are being licensed as private pilots at the rate of about 1,200 a year.

At the beginning of 1948 there were 1,309 private aircraft registered in Brazil. A majority of these planes were owned by the aero clubs, but many were owned by businessmen and farmers.

Aviation training for pilots, mechanics and traffic controllers is also provided by certain airlines, by the FAB (for military personnel) and by two schools operated by the Air Ministry, the Escola Técnica de Aviação and the Centro Técnico de Aeronáutica.

The Escola Técnica was organized during the war with the aid of the United States War Department and was originally directed by an American. This school is primarily a training center for FAB mechanics. About 1,500 students are now enrolled. The training is highly specialized and ill adapted to civil air requirements.

The Centro Técnico is a new school of aeronautical engi-

neering now in the process of organization. It is headed by an aeronautical engineer from the Massachusetts Institute of Technology and a group of prominent American aeronautical experts. The school was conceived, organized and financed by the Air Ministry.

Approximately 200 Brazilian civil air technicians and several hundred military airmen have been trained in the United States since 1941 under scholarship grants from the CAA and the USAF. The value of these training courses at home and abroad is evident in the results obtained. For example, in 1947 Brazilian airlines did not suffer a single fatal accident in either domestic or international operations.

Airports

Brazilian airports are generally used by both civilian and military aircraft, because the cost of constructing and maintaining duplicate facilities would be prohibitive. The large majority of airports in Brazil are barely adequate for twin-engined aircraft. There are some large and well-equipped airports, several of which were financed and constructed by the United States during the war.

Airports are constructed, operated and maintained by the Air Ministry. The 1947 budget included approximately $3.9 million for these purposes. Relatively small appropriations are also made by some state and municipal governments, but the total funds available are wholly inadequate to carry out an airport program on a scale necessary to provide extensive and safe air transport throughout the country. In an attempt to obtain additional funds, the Air Ministry issued a schedule of airport fees in 1946. These fees were considered arbitrary and excessive by the airlines, who refused to pay them, and the schedule was rescinded in August 1947.[12]

The financing of airports is one of the major aviation problems facing the country. Little aid can be anticipated

12. The fees were also discriminatory against foreign airlines, as they provided for a 75 per cent reduction in all charges for Brazilian domestic operations.

from private capital, as airports are usually not self-liquidating. The Air Ministry is toying with the idea of renting airports as concessions to United States interests, which would build, operate and maintain them and in return receive fees to be established. However, it is unlikely that this plan would prove attractive to any commercial organizations, in view of the scant possibilities of profit. As in other countries, airport financing in Brazil will probably have to be done by the government, with or without the assistance of foreign government loans.

The technical services of American firms will be required in connection with the expansion and development of airports.

Aircraft Manufacture

Various efforts have been made to establish an aircraft-manufacturing industry. Only one aircraft factory, the Cia. Aeronáutica Paulista, may be said to have achieved a measure of success before discontinuing operations in 1948. This company manufactured a two-place monoplane, powered by a 65 h.p. engine imported from the United States.

The Air Ministry operates a small factory at the Galeão Airport (Rio de Janeiro) which produces a few planes of the Fairchild PT-19 type. Another aircraft factory at Lagôa Santa near Belo Horizonte assembled a limited number of planes but is now inoperative.

During the war the government organized the Fábrica Nacional de Motores, with substantial financial and technical aid from the United States. This factory was designed to manufacture Wright Whirlwind engines. About twenty such engines were assembled from parts imported from the United States. No aircraft engine work is now done by this large factory. For several years the costly plant was virtually idle, except for some repair work. Recently a contract was made with the Isotta-Fraschini group of Italy for the assembly of motors and truck chassis.

Helicopters

Owing to heavy crop losses through insect ravages, dusting operations from helicopters may have possibilities. Some dusting in the state of Rio Grande do Sul was carried out by regular aircraft during the locust plague of 1947. Some consideration was given at that time to the possibility of contracting foreign concerns operating helicopters and experienced in such work. Short supplies of insecticides and lack of concentration of the crops to be dusted present obstacles. The International Basic Economy Corporation is interested in providing mechanized services for insect control.

Telecommunications

Brazil is well served by international cable, radiotelegraphic and radiotelephonic facilities. Domestic telephone service in the southeastern states is also good, but national telegraphic facilities are woefully inadequate. Steps are now being taken to improve the telegraph.

Telegraph a Government Function

The telegraph made its appearance in Brazil in 1852, only seven years after the first commercial telegraph line was inaugurated in the United States. The main telegraph network is now owned and operated by the government, under the Department of Posts and Telegraphs, these two services having been combined in 1931. The railways also maintain telegraph lines, primarily to serve their own needs, but also handling public messages to points not served by government lines. Some private networks are permitted in areas not reached by the government lines, such as in Rio Grande do Sul, in the Amazon Valley and in the western states. A plan for an improved national telegraphic system, involving both land lines and radio circuits, was approved by Decree No. 20428 of January 21, 1946. Further legislation was enacted at the end of 1948 (Law No. 498 of November 28) raising postal and telegraph rates and providing

for the expansion and modernization of the service, including the construction of several hundred new buildings.

When Emperor Pedro II visited the United States in 1876-1877 he made the acquaintance of a young man named Alexander Graham Bell, who was exhibiting an invention at the Philadelphia Centennial Exposition. It was the Emperor's insistence upon a personal demonstration that called the telephone to the attention of the judges and of the world. On his return to Brazil the Emperor introduced the telephone in Rio de Janeiro. Despite its early appearance, telephone development has not been extensive outside of the national capital. At the beginning of 1947, Brazil had 439,500 telephones, less than one per 100 of its population, as compared with 25 per 100 in the United States. Of the total, 71 per cent were automatic. Rio de Janeiro had 159,968 telephones, São Paulo 88,586, Santos 9,621, Belo Horizonte 9,594 and Niterói 7,944.

Telephones: Private Companies

Over 90 per cent of the telephones are operated by private companies, mainly foreign-owned. A few municipalities own small systems. The principal operating company is the Companhia Telephonica Brasileira, an affiliate of the Brazilian Traction, Light and Power Company, Ltd., which operates 326,000 telephones in the Federal District and in the states of Rio de Janeiro, São Paulo and Minas Gerais. It serves and connects all of the principal cities and towns as well as many smaller places, and also maintains radio channels, mutually operated with connecting companies, which provide toll service to nine other states. Owing to shortage of equipment, the demands for connections far outrun facilities. The backlog of orders exceeds 100,000.

The second largest network, in the states of Paraná and Rio Grande do Sol, is controlled by the International Telephone and Telegraph Corporation of the United States. Next is a group of companies in northeastern coastal cities

owned by Emprêsas Elétricas Brasileiras, an affiliate of the American and Foreign Power Company. The Pará Telephone Company, Ltd., a British company, operates the system at Belém. L. M. Ericsson, of Sweden, owns one company and operates another. About 270 localities are served by local private companies or municipalities.

International Communications

International communications are provided primarily by private companies, but the Department of Posts and Telegraphs has connections with the neighboring countries of South America.

A cable to Europe was completed in 1874. Before the second world war international cable connections were maintained by British, American, French, Italian and German companies. A joint Argentine-Brazil cable laid in the Uruguay River connects Paso de los Libres and Uruguaiana. The Italian company, "Italcable," was taken over by the Brazilian government; its facilities are used chiefly by the military authorities. Italcable lines between Brazil and Argentina were repaired in 1947, and arrangements were made with the French Compagnie des Câbles Sud-Américains for an interchange of cables between Brazil and France.

The two principal cable companies are the Western Telegraph Company, affiliated with Cables and Wireless, Ltd., and having operating arrangements with the Western Union of the United States, and All America Cables and Radio, Inc. Western Telegraph has cable lines connecting all of the principal port cities. Although these lines serve international communications principally, some internal traffic is permitted.

International radio telegraph and telephone services are maintained by Companhia Rádio Internacional do Brasil, S. A. (CRIB), an affiliate of International Telephone and Telegraph Corporation, and by Companhia Radiotelegráfica Brasileira (Radiobras), a British company.

Radio Audience Growing

The radiobroadcasting industry is expanding. There are over one hundred broadcasting stations and about 1.5 million household receiving sets in Brazil. Nine principal companies and a number of smaller ones, all located at São Paulo, assemble radio sets. Five of the leading companies also manufacture part or most of the components. Tubes, however, are not made in Brazil. Assis Chateaubriand, the newspaper publisher, controls a number of the more important broadcasting stations. Rádio Nacional, a Rio de Janeiro station, owned by *Á Noite,* an evening newspaper, was taken over by the government in 1940. In January 1948, it was granted the first authorization to operate a frequency modulation broadcasting station. The concession provides that all directors of the company, as well as operators and announcers, must be native Brazilians.

A complete line of radio transmitting and receiving apparatus, as well as telephone equipment and selectors for railways, is manufactured by Standard Elétrica, S. A., an affiliate of International Telephone and Telegraph Corporation, at its factory near Rio de Janeiro. Cacique, S. A. (55 per cent owned by Philips), General Electric, Cia. Marconi Brasileira and several local concerns also manufacture or assemble radio transmitting equipment.

Chapter 9

SOCIAL CONDITIONS

Immigration and Colonization

Brazil's postwar immigration policy has not yet been clearly defined. An important group, including many leading officials, landowners, manufacturers, railway officials and liberals who are opposed to restrictions on international movements, favor the revival of immigration on a substantial scale, for its stimulating effects on economic development and as a means of reinforcing the European elements of the population. On the other hand, various factors, some inherent in the nature of the soil and climate, others derived from the current social and political philosophy, tend to defeat efforts to attract immigrants of a type Brazil is willing to accept.

The immigration, naturalization and employment laws now in force are decidedly restrictive. Even if an immigrant can obtain admission under the 2 per cent quota and other restrictions, he cannot be naturalized without ten years continuous residence in the country, knowledge of the Portuguese language, good civic and moral conduct and a conforming set of opinions. Certain exceptions are allowed in the required period of residence. Immigrants of Portuguese nationality occupy a preferential position, yet the Portuguese government early in 1947 imposed restrictions on emigration to Brazil, one reason being its dissatisfaction with the employment discrimination in force in Brazil.

In his 1948 message to Congress, President Dutra favored a new immigration law and less restrictive naturalization legislation but made no mention of employment restrictions.

Early in 1948, Israel Pinheiro, Chairman of the Immigration and Colonization Committee of the Chamber of Deputies, announced that his committee was drafting new immigration and naturalization legislation and also would propose the creation of a national immigration and colonization department to coordinate policy and action in these fields, as prescribed by Article 162 of the Constitution.

At present the following federal agencies are concerned with immigration: the Immigration and Colonization Council, linked to the Ministry of Foreign Affairs; the National Department of Immigration of the Ministry of Labor; the Division of Lands and Colonization in the Ministry of Agriculture; the Port Health Service of the Ministry of Education and Health; the Passport Division of the Ministry of Foreign Affairs, and the maritime police and foreigner registration service of the Ministry of Justice.

In March 1948, the Immigration Council issued a clarification of the grounds for issuing visas. Recalling that Brazilian immigration policy is designed to preserve and reinforce the "most convenient characteristics of European ancestry" and to defend the Brazilian worker, it stated that, while this policy did not imply any racial or religious preconceptions, nevertheless Brazil has to give preference to those who are best adapted to the country's needs. Hence, the report continued, it is necessary to restrict the entry of persons who, by origin, character or customs, are not readily assimilable, as well as those who wish to come to Brazil to remain in the cities and "engage in activities that are superfluous if not parasitical."

The Granting of Visas

The instruction set forth the bases on which transit, tourist, temporary, special temporary and permanent visas might be granted. Brazilian Consulates are authorized to pass on all cases, without reference to Rio de Janeiro except in a few instances. When business firms or institutions wish to con-

tract the services of foreign technicians or professors, permission will be granted only after hearing the views of the Federal Council of Engineering and Architecture. If the decision is favorable, a special temporary visa will be granted for a period not exceeding three years.

Permanent visas may be granted to the following:

1. Farmers and specialists in agricultural-pastoral industries and functions who are willing to assume the obligation to work in the rural areas—preference to be given to families consisting of at least three persons able to work and between the ages of fifteen and fifty years
2. Artisans and qualified operatives
3. Specialists in health and hospital activities
4. Domestic employees, up to fifty years of age, who expect to serve in the homes of persons coming to Brazil or who reside permanently in Brazil
5. Hotel employees
6. Technicians of medium and higher grades

The granting of the visa does not, however, ensure the right of the recipient to exercise any particular occupation.

Nobody can engage in business in Brazil without registering with the Registries of Commerce. A foreigner must prove that his entry and his stay in the country are legal. He must produce a passport, including a declaration by the immigration service that the bearer is authorized to work in Brazil, a civil identification certificate and a certificate of the period of residence and good conduct of the foreigner in the country.

Only persons legally domiciled in Brazil may manage foreign corporations or work for them. Partnerships and other unincorporated commercial enterprises can be owned only by Brazilians. All firms, including corporations, operating under concession or contract from the federal or any state or local government must have a majority of Brazilians on their boards of directors.

Immigration and Colonization Agreements

The Brazilian Congress, in December 1948, approved the constitution of the International Refugee Organization, thus ratifying Brazil's adherence to that organization. During the preceding eighteen months Brazil had accepted some refugees selected by a Brazilian commission operating in Europe. The first quota of 5,000 was completed in July 1948. In August the first arrivals under a second program, also of 5,000 persons, were reported.

A considerable press campaign developed as to the suitability of the persons received under this program. Pointing to the alleged desertion of São Paulo fazendas by displaced persons assigned there, critics of the program insisted that the immigrants were not bona fide farmers but had merely used that as an excuse to enter the country, while others blamed the poor living conditions provided by the landowners. In practice, the São Paulo estate owners now look chiefly to internal migration to supply their needs and are actively recruiting workers in the northeastern states.

Negotiations are under way with Italy and Portugal to determine the bases for both voluntary immigration and organized colonization. An agreement for the settlement of Dutch immigrants between the São Paulo Department of Agriculture and the Netherlands Agricultural Cooperative was signed on November 12, 1948. Owing to the high birth rate in the Netherlands and the loss of the German market, overseas outlets are being sought for fifty thousand or more small farmers, who would bring their cattle, implements and household goods.

Preference Given to Brazilians

Public lands suitable for European colonization are limited. Furthermore, the opportunities for immigrants are restricted by military considerations and the desire to make a place for the thousands of Brazilians who are abandoning the blighted areas of the northeast. The National Security Council must

approve any grants of land in the "defense zones." The immigration law requires that a minimum of 30 per cent of the lots in any colonization project be reserved for Brazilians and that not more than 25 per cent shall be sold to persons of the same nationality other than Brazilians. Article 156 of the Constitution is particularly important:

> The law shall facilitate the settlement of the population in the rural areas, establishing plans for colonization and for the utilization of the public lands. In this connection, nationals shall be given preference, especially the inhabitants of the impoverished areas and the unemployed.
>
> 1. In granting concessions the states shall give squatters [*posseiros*] who make their habitual residence thereon, preference in acquiring title of up to twenty-five hectares.
>
> 2. No sale or concession of public lands exceeding ten thousand hectares may be made without previous approval by the federal senate.
>
> 3. Anyone, neither a rural nor urban proprietor, who occupies a piece of land not exceeding twenty-five hectares, for ten years consecutively, without opposition and without recognition of other ownership, and who makes it productive and dwells thereon, shall acquire ownership, by duly recorded judgment.

The high prices of agricultural products during the war and postwar years have given an added incentive to opening up lands in frontier zones in Goiás, western São Paulo and Paraná, and furnished part of the impulse behind the launching of the Central Brazil Foundation (Fundação Brasil Central) in 1943. The foundation was designed to prepare the way and colonize the highland areas at the headwaters of the Araguaia and the Xingú rivers and in general to serve as the spearhead of Vargas' "march to the west." Some work was done on roads from Uberlândia, in the extreme western triangle of Minas Gerais, across southern Goiás. A new town called Aragarças was laid out at the junction of the Araguaia and the Garças rivers. In 1946, João Alberto, the energetic head of the foundation, visited the United States in the hope of obtaining American financing for completing the project and carrying out large-scale immigration, but nothing came of this move.

National Agricultural Colonies

In 1941 and 1942 provision was made for the establishment of national agricultural colonies and agro-industrial colonies. Agricultural colonies, under the supervision of the Divisão de Terras e Colonização of the Ministry of Agriculture, were authorized in Maranhão, Pará, Amazonas, Goiás and Mato Grosso. An "agro-industrial" colony was established at Itaparica in the state of Pernambuco, near the Paulo Afonso falls. The most successful of these has been Colônia Agrícola Nacional, about seventy-five miles north of Anápolis, the terminus of the Goiás Railway. About 4,500 farms have been taken up by migrants from north, south and east, and others are arriving at the rate of several hundred a month. Both land and buildings are free, but the property cannot be sold, and can be held only as long as the occupant or his descendants effectively cultivate the land. The colony has established a sugar mill, sawmill, brickyard, hospital and school, and has built a road from Anápolis. This colony will be able to accommodate a rural population of 50,000 to 75,000.

Some lands have been made available for settlement through the drainage and sanitation works of the Departamento Nacional de Obras de Saneamento, particularly along the Atlantic Coast. Best known of these operations is the reclaiming of the lowlands of the state of Rio de Janeiro, the Baixada Fluminese.

The most extensive and successful private colonization venture of recent years has been the settlement of northern Paraná by Paraná Plantations, Ltd., of London, which built a railway from Ourinhos, in São Paulo, on the Sorocabana Railway, established headquarters at the new townsite of Londrina, opened roads along the ridges and sold off the land in plots ranging from about thirty to six hundred acres with an average of about eighty-four acres. Settlers included many nationalities: Brazilians, Germans, Poles, Czechs, Japanese and southern Europeans. Coffee, cotton, corn and hogs have been the principal products raised. The company

acquired altogether approximately three million acres before it was taken over in 1943-1944, the railway by the Brazilian government and the North Paraná Land Company by a Brazilian company that is continuing the sale of lands. About 300,000 people have settled in this region since the late 1920's.

Some large settlement projects have been carried out in western São Paulo, notably the subdivision of properties of Antonio J. Maura Andrade along the Noroeste Railway. An estimated 80,000 persons have settled on these properties during a brief period of five or six years.

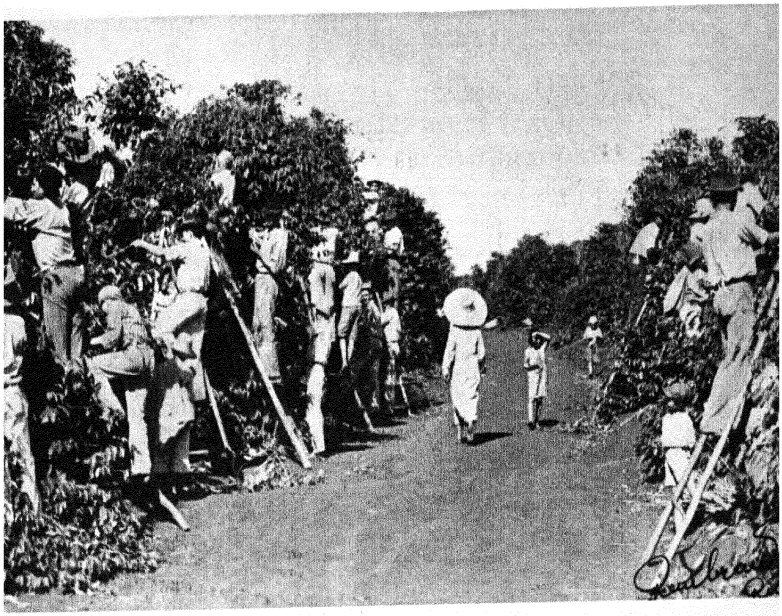
The railways of São Paulo, particularly the Mogiana and the Paulista, have been active in resettling old coffee estates along their lines.

Semiofficial Japanese colonization companies had settled large areas before their activities were checked by World War II.

Immigration and Development

With the completion of the pending immigration treaties and the return of more normal shipping conditions, some revival of voluntary immigration should be expected. Controlled colonization projects, under official auspices, may also be expected to have a large place in the picture. Considerable areas suitable for European colonization still exist, subject to provision of transportation and sanitation. In some cases drainage or irrigation may be required. In the past immigration has been closely associated with the expansion of coffee cultivation. Sometimes the colonists were dumped in the wilderness and left to struggle with a hostile environment, out of touch with civilization.

The need at present is to work out colonization projects in connection with desirable agricultural or industrial developments, under conditions that will make possible a reasonable and an improving standard of living. This is not possible in some of the more remote regions, unless the development of mineral or petroleum deposits in the vicinity, or other



COFFEE GROWS ON TREES and these workers are picking the green coffee beans that make up Brazil's most valuable export. As the world's largest producer of coffee, Brazil is frequently harassed by an oversupply of coffee in world markets.

PROSPECTORS, BRAZILIAN STYLE, are these *garimpeiros*, or free-lance diggers. Some 100,000 Brazilians dig thus for diamonds, precious stones and minerals. These are digging tantalite, a mineral often found combined with iron ore.

articles of high value, justifies the cost of providing transportation, sanitation, electric power, hospitals and schools. Of interest in this connection is a report on the activities of the Central Brazil Foundation, which concluded that the building of Aragarças and the attempt to colonize the region between the Xingú and the Araguaia were "premature." [1]

Labor and Social Security

Labor legislation in Brazil had its beginning at the close of World War I, influenced by growing industrial employment and the establishment of the International Labor Office. The first important law (January 15, 1919) provided for accident compensation, which was later extended to occupational diseases. The law on these matters is now a part of the civil code. During the following decades legislation was enacted protecting women and minors, regulating industrial hygiene and providing for annual vacations with pay. The first social security institution was established in 1923.

Among the early acts of President Vargas were the creation of a Ministry of Labor, restriction of immigration and the requirement that two thirds of the workers in all enterprises must be Brazilians.

Until a constitutional amendment was adopted in 1926, federal labor legislation applied only to the Federal District and the territories. The Constitution of 1937 contained similar provisions. The 1946 Constitution reserves labor legislation to the federal government and establishes certain basic principles (Articles 157-59).

Labor laws were consolidated by Decree-Law No. 5452 of May 1, 1943, which has subsequently been amended in some particulars. The principal provisions are:

Each worker must have a work card (*carteira profissional*) on which a record of employment and compensation must be kept.

1. Paulo Osório Jordão de Brito, "A Fundação Brasil Central," *Revista do Serviço Público,* Ano XI, Vol. 1, Nos. 1 and 2 (January-February 1948), p. 59.

The working day is normally limited to eight hours, but labor contracts may allow two hours overtime, which is paid at a rate 20 per cent higher than pay for normal hours.

Provision is made for minimum wages, the rates for which are established from time to time.

Provision is made for inspection to ensure health and safety.

Certain types of employment are governed by special provisions.

Two thirds of the employees of an establishment must be Brazilians, and two thirds of the payroll must go to Brazilians.

Special protection is given to women and minors.

Employees dismissed without lawful cause shall be compensated at the rate of one month's wage for each year of work. The first year's employment is considered a trial period. An employee who has been employed for more than ten years shall not be dismissed except on account of serious offense or *force majeure,* duly established by competent authority.

A weekly rest of twenty-four hours must be granted.

Every employee is entitled to fifteen days annual vacation with pay.

The constitutional provision requiring payment to labor in Brazil for a weekly day of rest was implemented by Law No. 605 of January 5, 1949, published in the *Diário Oficial* of January 14, 1949. The law also stipulates that, except for essential services, work is prohibited on civil holidays declared by federal law and on religious holidays according to local custom (not to exceed seven), but that labor must receive pay for those days. In case of necessary work on civil and religious holidays, double wages must be paid unless the employer grants a compensatory day of rest. The law applies to all day and piece labor except domestic labor and government employees. It is not applicable to employees

remunerated on a monthly or bimonthly basis, as they are considered to be already paid for a weekly day of rest and for holidays. Employees paid on a monthly or bimonthly basis are defined as those whose salary is calculated on the basis of thirty or fifteen days, respectively, or whose deductions for absenteeism are calculated on the same basis. Payment for the weekly day of rest is contingent upon full-time appearance for work during the preceding week unless due cause is shown for nonappearance. Justified reasons for absences are enumerated in the law.

The 1946 Constitution and laws provide for a system of labor courts and conciliation boards. A special council passes on social security matters. The regular courts hear cases relating to work accidents.

The 1946 Constitution (Article 157) introduced several new requirements that have not yet been implemented, for example, worker participation in profits.

Article 168 provides that industrial, commercial and agricultural establishments employing more than one hundred persons are obligated to maintain free primary schools for their employees and their employees' children.

Organizations of Employers and Workers

The labor code and subsequent legislation provide for industrial associations of both employers and employees, subject to approval by the Ministry of Labor. The organization of national confederations must be approved by the President of Brazil. At the end of 1947 there were nearly a thousand syndicates, or unions, having a membership of 463,000. The activities of the syndicates have always been closely supervised, partly to prevent financial abuses, and, more recently, to prevent Communist domination. A left-wing workers' federation (Confederação dos Trabalhadores do Brasil—CTB), organized by a national syndical congress in 1946, was declared illegal by the decree of May 7, 1947 which dissolved the Communist Party. In his message to Congress, President Dutra reported that the government had

"intervened" in 143 syndicates out of a total of 944 "to eliminate extremist elements."

In view of the official restraint on their activities, the syndicates function primarily as welfare organizations. The evolution of democratic labor unions has been retarded by the anarchosyndicalist or Communist antecedents of many of the labor organizers, on the one hand, and the repressive tactics of the government, on the other. Vargas promulgated a large mass of labor legislation but did nothing to encourage the growth of independent, constructive labor leadership.

Both employers and employees must pay an annual fee or tax, which goes to support their respective class organizations. These sums are paid into the Bank of Brazil by the employer, who pays for his own account as well as for that of the employees, deducting the amount paid for the latter from their salaries.

An employer or employing company pays on the basis of the company's capital, ranging from Cr. 300 to Cr. 1,000 ($15 to $50) yearly. The employee's contribution is equivalent to one day's wage or salary a year, and must be deducted whether or not the worker is a member of the syndicate corresponding to his employment. The syndicates also attempt to collect monthly dues, amounting to the equivalent of fifteen to fifty cents (United States currency), but not always successfully. The constitutionality of the syndical tax has recently been challenged in the courts, with indecisive results.

Social Insurance and Assistance

The social security system has had a huge development since 1923, when the first retirement and pension plan was set up by the private railways. There are now five "institutes" (national organizations on an occupational basis) and thirty "funds" (organizations of workers of a particular company or employees of a single state or municipality), with approximately three million members. In

addition, civil servants and the armed forces have their own social insurance and welfare organizations. Altogether the members covered and their families number about fifteen million persons. Rural workers, domestic servants and some types of urban workers are outside the fold. In 1947 retirement and dependents' pensions were being paid to 254,753 persons.

Social insurance covers workers in industry, commerce, banking and transport, seamen and dockers, railwaymen and employees of public utility services. Contribution rates, the conditions of eligibility for benefits and the amount of benefits vary considerably in the different institutions, but most cover the risks of invalidity, old age, death, industrial accidents and occupational disease, sickness and maternity.

The social security institutions are under the supervision of the Department of Social Welfare, a subsidiary of the Ministry of Labor.

Since 1945 the employee's total contribution to the insurance system has been fixed at 5 per cent of the associate's wage or salary, on compensation up to Cr. 2,000 ($100) a month; an equal amount is paid by the employer and the government.

Decree-Law No. 7526 of May 7, 1945 provided for fundamental reform in the insurance and assistance systems and created an over-all Social Welfare Institute (Instituto de Serviços Sociais do Brasil) designed to unify and standardize the system, but it has never been put into effect. New legislation was introduced in November 1947.

The annual receipts of the institutions in 1946 were running at approximately Cr. 3,737 million ($186.8 million) and expenses at Cr. 1,543 million ($77.1 million). Reserves are about Cr. 7,000 million ($350 million). The government had not paid up its contribution in full; its debt amounted to Cr. 2,409 million ($120 million) at the end of 1948. Furthermore, the government has liquidated its quota in the past by requiring the institutes to accept shares in govern-

ment-controlled enterprises that are now quoted below par and are paying no dividends. These investments include shares in the National Steel Company, Cia. Vale do Rio Doce, Cia. Hidro-Elétrica do São Francisco and the Reinsurance Institute.

Integration of Social Assistance Agencies

President Dutra has called attention to the urgent need for integrating the activities of the various agencies now providing social assistance. In addition to the social insurance institutes, other agencies in the field are the Legião Brasileira de Assistência (LBA), Serviço Social da Indústria (SESI), Serviço Social do Comércio (SESC), and the welfare services of the syndicates. LBA was created during the war to look after the families of members of the Brazilian Expeditionary Force. SESI (Social Service for Industrial Workers) and SESC (Social Service for Commercial Workers) were created in 1946, and are managed by the industrial and commercial associations, respectively. Funds are derived from a 2 per cent payroll tax paid only by employers. The welfare activities, varying in different sections, include medical attention, maternity and child care, nutrition and housing. One of the principal activities has been the establishment of food supply stations.

Retirement, dependents' pensions, medical and hospital assistance and housing loans are provided for federal employees and other voluntary members by the Instituto de Previdência e Assistência dos Servidores do Estado (IPASE).

Among the types of social assistance provided by these organizations are medical and hospital care and dental service; supplying foods, medicines and other necessities at cost; legal assistance, funeral benefits, maternity assistance, language and technical classes, housing and recreation.

Despite the advantages some groups have obtained from social insurance and assistance, the feeling is general that the benefits are not in proportion to the large sums collected

from employers and employees. The check on expenditures is not sufficient to prevent grave abuses, and overhead costs are high. In some cities several institutions may operate similar services, while other fields are neglected. Some persons feel that the institutes have overextended their programs of social assistance and that their primary function is to provide insurance benefits.

Costs Arising From Social Benefits

The charges growing out of social legislation amount to 20 to 26 per cent of an employer's payroll, not including payment for weekly rest days or for public holidays, which involves about 22.8 per cent additional. The latter obligations, of course, amount to a flat wage increase. These charges vary slightly for different employers, but the following itemization is typical:

	Per Cent of Payroll
Social security	
Monthly contribution	5.00
Initial contribution, payable in installments over five years	.28
Salary increase	1.70
Assessment for service prior to retirement legislation	.08
Syndicate tax	.02
Apprentice schools (SENAI or SENAC)	1.00
Social services (SESI or SESC)	2.00
Annual holidays	5.26
Brazilian Social Service League (LBA)	.38
Sick pay (two thirds of salary or 15 days, recurring periods)	.22
Work accident insurance	3.00
Maternity	.05
Absences for births and deaths	.04
Severance	.22
	19.25

Wages and Cost of Living

The available Brazilian statistics do not provide an adequate basis for determining the relationship between wages

and cost of living as compared with earlier periods, but both wages and prices have probably increased about three and a half to four times over the 1939 level. Some wages have increased less than this, others more. Food and clothing prices have increased considerably more than the general cost of living; rents have increased only slightly. Rents were frozen at the beginning of 1942 and only small increases have been permitted since that time. Persons in more comfortable circumstances, however, usually have to pay a large premium to get a house or apartment if they are unlucky enough to have to make a change.

The wage scales published by the Ministry of Labor cannot be accepted as showing the exact situation, since these do not always take into account the bonuses and special payments made over and above the wage shown in the worker's carteira. Most large employers pay a regular cost of living bonus averaging about 15 per cent, and in addition Christmas bonuses are usually paid. From the standpoint of both worker and employer, this has the advantage that the 5 per cent social security deduction is made on the basis of the basic wage scale shown in the carteira. Recently an attempt has been made to interpret regularly paid bonuses as part of the basic wage or salary.

Regional and Group Variations

Wages vary greatly in different sections of the country and among different types of employment. Workers in some industries in São Paulo and Rio de Janeiro and in some outlying sections earn nearly as much in an hour as workers in some of the old northeastern states make in a day. In the rubber-manufacturing industry the average pay of workers paid at an hourly rate is Cr. 70 ($3.50) a day; salaried employees get Cr. 3,000 ($150) a month. In Pôrto Alegre the scale is from Cr. 25 to Cr. 38 ($1.25 to $1.90) a day and Cr. 2,000 ($100) a month for salaried employees. At the new pulp and paper mill in Paraná wages are Cr. 3 ($.15)

an hour for unskilled workers and Cr. 11 ($.55) an hour for the highly skilled. Houses with running water and electricity are provided at a nominal rental of about Cr. 20 ($1) monthly. At an old iron and steel plant in Minas Gerais common laborers are paid about Cr. 500 ($25) a month, but a number of older employees receive twice as much. Houses with garden plots are furnished at a rental ranging from Cr. 40 to Cr. 70 ($2 to $3.50) a month. Chauffeurs receive from Cr. 700 to Cr. 1,000 ($35 to $50). Free schools, medical assistance (for the worker's family as well as himself) and a maternity hospital are provided.

Earnings of railway employees are relatively low, but most of them live in the smaller towns and cities, where costs are less than in the large cities. They have security of employment and many receive free housing, food and supplies at reduced prices, the use of garden plots, and certain social services in the way of medical and maternity benefits. The reports of the Paulista Railway show that the average monthly wage of its 16,000 employees in 1946 was Cr. 958 ($47.90). The Vitória a Minas Railway, a government-controlled enterprise, has a starting wage of Cr. 550 ($27.50) a month for common laborers, Cr. 750 to Cr. 1,000 ($37.50 to $50) for skilled workers and Cr. 3,500 to Cr. 6,500 ($175 to $325) for professional personnel (engineers, etc.).

Although the law provides for equal wages for equal work, in practice women are usually paid at a lower rate than men. In the case of unskilled industrial workers, the wage rate for women may average nearly 40 per cent less. Most of the workers in the skilled category are male. In a few occupations women are relatively well paid, owing to the scarcity of qualified persons. Some women have been successful in business and the professions. A few women occupy responsible government posts, in municipalities, and in the federal and state departments of health, labor and education. A woman is director of the National Museum.

It is difficult to pin down the earnings of federal and

state employees. The basic salary scales have a much wider range than in the United States; furthermore, higher employees receive various supplementary payments, some quite large. Practically all government employees have regular occupations in addition to their official positions. The hours for federal employees at Rio de Janeiro are from 11 A.M. to 5 P.M. on weekdays and from 9 to 12 A.M. on Saturdays, but even these hours are flexible. Until recently, the same person might collect salaries for several government jobs at the same time.

Typical Worker Family Budgets

An investigation conducted by SESI in 1946 covering 3,091 workers in fourteen important factories in the Federal District showed an average wage of Cr. 893.30 ($44.67) a month and an average income of Cr. 279.70 (approximately $14) from other sources, making a total of Cr. 1,173 ($58.67). Average monthly expenses were Cr. 1,110.80 ($55.54), distributed as follows:

	Amount in Cruzeiros	*Equivalent in Dollars*	*Per Cent of Total*
Food	601.00	30.05	54.1
Housing	125.10	6.26	11.3
Transportation	37.60	1.88	3.4
Clothing	122.60	6.13	11.0
Hygiene	31.60	1.58	2.8
Recreation	37.80	1.89	3.4
Education	17.70	.88	1.6
Medicines	24.90	1.25	2.2
Doctor	4.10	.20	0.4
Dentist	14.90	.74	1.3
Social security	47.60	2.38	4.3
Miscellaneous	45.90	2.30	4.1
	1,110.80	55.54	100.0

Wage Scales of American Firms

Large American and Canadian companies have wage and salary scales considerably above the average in the areas

where they operate. One large United States firm maintains a minimum wage for workers of Cr. 1,200 ($60) a month: the chief mechanic receives Cr. 2,750 ($137.50); welders, first class, Cr. 2,050 ($102.50); welders, third class, Cr. 1,500 ($75); carpenters, second class, Cr. 1,500 ($75); master carpenters, Cr. 2,400 ($120); chauffeurs, Cr. 2,020 ($101). Messenger wages start at Cr. 750 ($37.50). The average salary of office workers at Rio de Janeiro for this company is Cr. 3,500 ($175) a month. The minimum wage established by law is Cr. 360 ($18) for commercial or office workers and Cr. 410 ($20.50) for industrial workers.

In October 1947 a branch factory of an American company at Rio de Janeiro, with 280 employees, of whom 220 are factory operatives, was paying the equivalent of about 14 cents an hour to apprentices and 60 cents an hour to mechanics. The average weekly earnings of workers other than beginners and mechanics amounted to $13 for men and $8 for women. Skilled mechanics earned $28 a week, including some overtime pay.

Unskilled workers in this factory represent a cross-section of the Brazilian population; they are good workers, with nimble fingers and quick minds. Skilled workers are mostly the offspring of European immigrants, principally Italian and Portuguese. Volume and quality of output compare favorably with production in the United States and other countries. Workers are organized in craft unions.

Worker benefits in addition to salary fall into the following classes (amounts given in United States currency):

Contribution to social security institute. In addition, employees have their own benefit society, to which the company made an initial contribution of $1,500.

Free group insurance; three categories of policies, $1,000, $750 and $500.

Medical examination; optical examination also being instituted. Medical and dental services in plant; workers pay only for materials, such as false teeth.

Two free uniforms annually.

One meal at the factory, costing about 38 cents; charge to workers, 7.5 cents: includes piece of meat (150 grams), beans and rice, vegetable, roll, orange or banana, glass of milk and coffee.

Christmas party and dance.

Annual bonus amounting to about two weeks' pay.

HOUSING

Wooden houses are rarer in Brazil than in the United States. This type of construction predominates only in the rural areas of southern Brazil and in parts of the Amazon Valley. In Paraná, wooden houses of so-called German and Polish types are found on isolated farms, in village clusters and on the outskirts of the larger towns and cities. These have vertical board walls (no clapboards) and usually have shingled roofs. There is normally a narrow porch on one or more sides. Some of these houses may be set amid attractive flower or vegetable gardens, but many wear an air of neglect, poverty and isolation.

A "typical" Brazilian house of the better type, say in São Paulo, is built largely of brick or masonry. Somehow these buildings quickly take on a patina of age so that new cities that have sprung up within the last twenty-five years, such as Marília, appear more settled and mature than many American communities with a much longer history. Part of the old-world effect is probably due to the troops of pack animals and the horse gigs that appear on the streets, and also to the old-fashioned costumes and manners of the farmers who come to buy or sell.

In a less favored area, for example the middle São Francisco Valley, the prevailing types of buildings bear a generic resemblance to those in São Paulo, but only the more prosperous citizens have houses of brick, the rest have adobe houses with roofs of thatch or flattened gasoline tins. Even the better type of house seldom has a ceiling or interior

walls. The buildings are usually whitewashed inside and out. In the better houses there is a large and well-furnished living room, and a dining room leading out onto a covered veranda filled with potted plants. Bedrooms leading off the porch are apt to be dark and poorly ventilated. Almost none of the towns in this valley have running water or sewage disposal. Water is brought from the river in jars or tins.

On the outskirts of every town or city, large or small, is a fringe of tawdry dwellings beyond the range of paved streets and public utilities. Many are erected by squatters on public lands along the ocean fronts or on the banks of rivers, which provide water and such sewage disposal as exists. Others cling to the flanks of the hills that are a conspicuous feature of the landscape in many Brazilian cities. Some, like United States shantytowns, are built of lumber scraps and oil tins; others are of adobe with thatched or even tiled roofs.

Perhaps a million of these dwellings exist, in urban communities, as plantation or factory worker towns, or scattered through the rural areas wherever the caboclo finds a spot for his *roça* of corn and beans. Well known are the *mucambos* of Pernambuco, mud-daubed structures with frames of saplings or sticks and covered with straw or palm-leaf thatch. A census taken in 1939 at Recife, the third city of Brazil, revealed over 45,000 mucambos housing 165,000 persons. Most of the occupants are Negroes or mulattoes, many of whom retain vestiges of African speech, religion and customs. The colored population at Salvador is proportionately even larger, and is perhaps not much better off, but somehow the picturesque dress and gay charm of the *Bahianos,* and particularly the *Bahianas,* seem to relieve the drabness of the picture.

City Planning Under Way

City planning is a growing profession. In addition to the civic improvements under way in most of the larger cities,

Brazil provides several encouraging examples of "planned cities." The most notable of these is Belo Horizonte, capital of the state of Minas Gerais, built on the former site of a royal remount station (*curral d'el rey*). Construction was begun at the turn of the century. Now it is the sixth city of Brazil. Its layout strongly resembles Washington, D. C., but fortunately the site was better chosen from a climatic standpoint.

Goiânia, the new capital of Goiás, was built on a new site to replace the old, fever-ridden capital. Although work was begun only in 1934, it now has about 50,000 inhabitants. In the 1940's the Central Brazil Foundation drew up plans for the new city of Aragarças, at the junction of the Araguaia and the Garças rivers, as the base for the development of a large and little-known area in Mato Grosso and Pará, but little progress has been made beyond the original nucleus of residences and utilities.

An attractive feature of the new construction in Rio de Janeiro is the provision for arcades on both sides of the streets as shelter against rain and sun. Even the new buildings along the 250-foot-wide Avenida Getúlio Vargas, which are being built at a uniform height of twenty stories, are supported by *pilotes,* or great pillars, on the street side to provide sidewalk space in the shelter of the buildings.

Housing Developments

Despite the building boom of the last decade in all the principal cities, a shortage still exists for both the upper and the lower middle class, and only a start has been made in providing housing for low-income groups. There are scattered model working-family communities, constructed by large industrial concerns or plantation owners. Government projects usually include them. The principal railways have long furnished houses to a large part of their personnel.

Housing loans are granted to their members by the social security funds and institutes. Back in the twenties, interest

rates ran as high as 18 per cent, but this is one instance where interest rates have effectively been reduced. The maximum rate for term loans is now 6 per cent. In recent years several of the institutes have launched building programs of both single-family homes and apartment houses. The Industrial Workers Institute began its first project at Realengo, a suburb of Rio de Janeiro, in 1939. It has completed 4,000 residential units (839 in 1947), and in 1948 will complete 2,084 units and start 1,707 in addition. The transport workers are reported to have completed 2,000 units, and the Banking Institute has 2,600 under way. The Institute of Commercial Workers has turned over 158 residential units to associates and expects to deliver 600 more in 1948. The larger developments have been in Rio de Janeiro and its vicinity, or at Niterói, across the bay, but smaller projects are now under way in various cities of the north and south.

Some municipalities have taken an interest in the housing problem. At Rio de Janeiro the prefecture erected wooden units in 1942 to accommodate 6,000 persons from the favelas, or shantytowns. At Recife about 6,000 units have been constructed in a move to replace the insanitary mucambos, which have long given the capital of Pernambuco a quasi-oriental, quasi-African appearance.

In 1946 the federal government set up a low-cost housing agency (Fundação da Casa Popular) to regulate the building activities of the social insurance institutions and to lend money at low interest rates for housing developments, especially in the rural areas. Owing to the size of the job and the limited funds, the foundation had confined its activities to study and plans up to the latter part of 1947. It took over from the Brazilian Social Service League (LBA) one incomplete project at Marechal Hermes (near Rio de Janeiro) consisting of 586 units. In September 1947 President Dutra appointed a new director, with instructions to act. Since that time the housing agency has initiated 220 units at Juiz de Fora (Minas Gerais) and 50 at São Luís (Maranhão) and

has plans for 2,486 additional units, partly in conjunction with local municipal authorities.

SESI has launched a program involving 10,000 prefabricated housing units and has acquired timber stands and milling facilities.

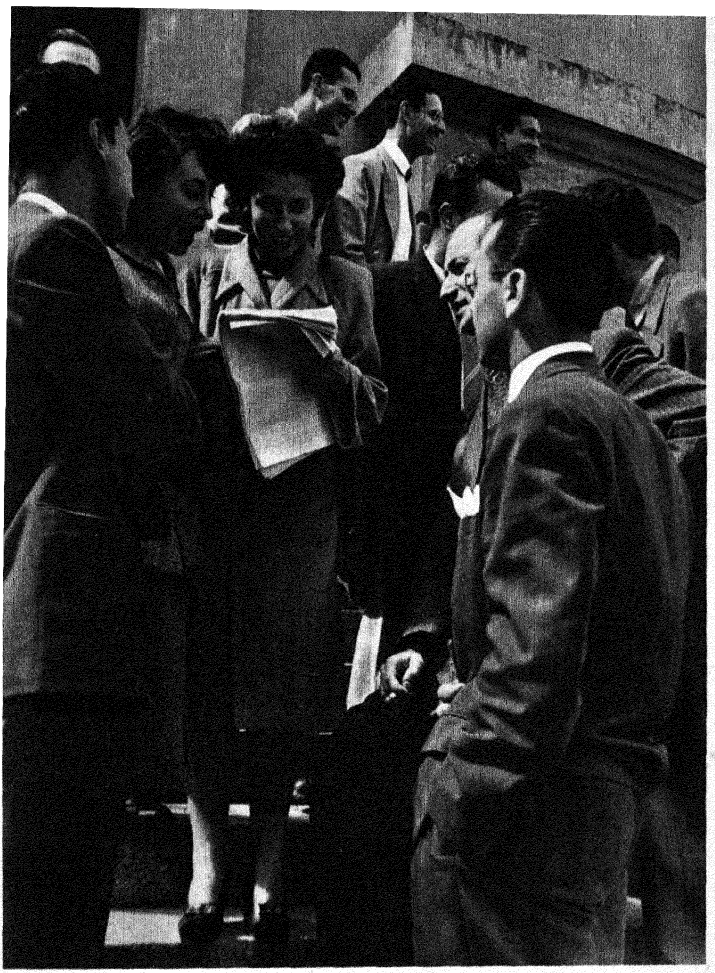
A study made by the Fundação da Casa Popular indicates that to provide adequate housing for low-income groups a building program of 19,000 houses a year for twenty-five years is required. The minimum cost, as of 1946, was about Cr. 40,000 ($2,000) a unit, which, at 8 per cent interest, places the housing beyond the reach of most workers. The retirement and pensions institutes have lent the Fundação Cr. 188 million ($9.4 million) at 5.5 per cent interest for a period of fifteen years. Some students of the housing problem feel that it cannot be solved by the use of social security funds, which should be reserved to meet the retirement and pension functions, but requires public subsidy.

Health and Sanitation

Health is undoubtedly one of the major problems in Brazil today. President Dutra has rightly given it first place in his five-year program of national development. In no other field can such large returns be obtained from so relatively small an investment.

The urgency of the problem is shown by the fact that average life expectancy in Brazil is 39 as compared with 64 in the United States. From an economic standpoint the poor health and the short life of a large part of the population are serious handicaps to the raising of standards of productivity. In the rural areas most of the children do not live long enough to make any contribution as workers. The 1940 census showed that 42.5 per cent of the population was under fourteen years of age. Twenty per cent of the children die before reaching the age of twelve months.

The first big step forward was taken at the turn of the century, with the improvement of sanitary conditions at Rio



WOMEN MEDICAL STUDENTS number about thirty among the total student enrollment of six hundred at the College of Medicine in Pôrto Alegre in the state of Rio Grande do Sul. In addition to the school of medicine in the University of Brazil, there are twelve independent medical colleges in various parts of the country.

de Janeiro, Santos and other coastal cities, and the beginning of a campaign for the eradication of yellow fever, which immortalized the name of Dr. Oswaldo Cruz. The Oswaldo Cruz Institute, near Rio de Janeiro, is now an important center of research and teaching.

The Rockefeller Foundation has also been a pioneer in various phases of health work in Brazil. It gave assistance in the establishment of a medical school and hygiene institute at São Paulo. The first trained nurses were prepared with the help of the foundation. Its original investigations in health problems have contributed greatly to progress in combating yellow fever, malaria and hookworm.

A leading Brazilian institution is the Gafrée-Guinle Foundation at Rio de Janeiro for combating venereal diseases.

The Ministry of Education and Health was created in 1930. Under it are various national services, dealing with the principal diseases, such as tuberculosis, malaria, cancer, leprosy and yellow fever. However, the main health responsibility rests with the states and municipalities.

Many Brazilian cities, including some fairly large ones, have very inadequate water-supply, sewage and waste disposal systems, if any at all. The improved financial position of the municipalities as a result of the 1946 Constitution, however, will make possible substantial progress in this regard.

Cooperative Health Service

The cooperative health service established with United States aid during the war has brought about important improvements in the Amazon and the Rio Doce valleys and has stimulated interest in a wide area. This service, known as Serviço Especial de Saúde Pública (SESP), was created on July 17, 1942 by agreement between the governments of the United States and Brazil to protect the health of United States and Brazilian military and civilian personnel.

In the beginning, SESP placed major emphasis on health

work in strategic areas, but at the same time an attempt was made to provide facilities of long-term value. Three hospitals, thirty health centers and thirty-nine subposts were established. A dike was built at Belém to prevent flooding, and mosquito-breeding places were drained. DDT has been used for mosquito control in the towns of the Amazon and the Rio Doce valleys, with such satisfactory results that "DDT-izing" has been turned into a Brazilian word and the process is being used extensively by the national antimalaria service. Some twelve towns have been provided with public water-supply systems. Sewage systems have been installed, and many privies have been erected in smaller communities.

Health work was undertaken in the Rio Doce Valley in connection with the reconstruction of the Vitória a Minas Railway at a time when a larger movement of Itabira iron ore and other strategic minerals was of vital importance. The leading communities along the line, Colatina, Aimorés and Governador Valadares, were provided with public water systems, sewage systems and health centers, and similar work was undertaken at some of the smaller centers.

Each of the health centers has vegetable gardens. Seeds are distributed and information on diet provided. An important training program has been carried out: 124 professional personnel have been trained in the United States and 566 in Brazil.

The United States has contributed $9,810,800 to this work since it was inaugurated in 1942, as against a slightly smaller sum contributed by Brazil. The United States contribution is on a diminishing basis. The budget for 1948-1950 provides for a United States expenditure of less than one million dollars as against the Brazilian budget of five million dollars. SESP operates under the joint responsibility of the Brazilian Minister of Health and the local representative (at present Dr. Eugene P. Campbell) of the Institute of Inter-American Affairs, a United States government agency. All expenditures must be approved jointly.

Growing Interest in Health Facilities

The results achieved by SESP have stimulated general interest in sanitation and health measures. In addition to the money granted by the two governments, various states and municipalities have contributed over one million dollars for improvements in their localities carried out under SESP direction. It has not been possible to take care of all requests, owing to inadequate staffs. The confidence in SESP is shown by the fact that it is being requested to take care of the health activities which will be a part of the Amazon development program.

At present the work of the Institute of Inter-American Affairs in this field is severely hampered by the uncertainties of United States congressional action on appropriations. In order to achieve the maximum results, there should be a definite commitment for a period of sufficient length—say ten years—to enable the service to recruit and hold competent personnel and to work out an integrated program that can be of lasting benefit to both countries.

There is a serious shortage of nurses and hospitals. A fine new building for the new nurses' school at São Paulo, operated in conjunction with the Hospital das Clínicas of that city, was inaugurated on October 31, 1947. Several new public hospitals have been inaugurated in recent years, including one at Rio de Janeiro by the Public Workers Institute (IPASE) and others by various social security institutions. SESI and SESC, the social service organizations of the industrial and commercial associations, are devoting considerable attention to health clinics, child care and maternity care.

Rio de Janeiro has some small private hospitals, without regular staffs and with only a few graduate nurses, but it does not have a single first-rate hospital. A group of Brazilian physicians, ex-students of United States medical schools, is endeavoring to obtain support for a private hospital, with a teaching program for interns and nurses.

EDUCATION

During most of its history Brazil has followed what may be called an aristocratic concept of education, providing higher education to an elite, but not teaching everyone how to read and write. The ideal of universal education is now accepted, but much time will be required to make it a reality.

Until the 1930's education was primarily the responsibility of the states, although the federal government maintained some primary schools in the Federal District and the Pedro II College at Rio de Janeiro, aided several normal schools and established colleges of engineering, mines, law, medicine and fine arts.

Federal participation was increased in 1930 with the establishment of the Ministry of Education and Health and in 1934 the new Constitution decreed a national system of education. The present Constitution gives the federal government the right to determine "the basis and general lines of national education," and requires it to devote not less than 10 per cent of its tax revenues to education. The states and municipalities are required to devote 20 per cent of the general tax revenues to education. In the past, the municipalities did not have sufficient resources to support anything but the most rudimentary schools. The lack of educational opportunities has been an important cause of the migration from the interior to the urban centers.

Elementary Education

At the end of the imperial era in 1889, enrollment in primary schools totaled only 250,000 out of a population of over 13 million. A large part of the primary schools and most of the secondary schools were private. Although higher education has been, and still is, principally along European lines, the development of primary schools has been greatly influenced by American practices. The ideas introduced by American mission schools, particularly the Escola Americana at São Paulo and others at Piracicaba, Campinas and Ribeirão

Prêto (São Paulo), Pôrto Alegre (Rio Grande do Sul), and Lavras and Juiz de Fora (Minas Gerais), have penetrated to all parts of Brazil. The public school system of the state of São Paulo reflected these ideas.

The Constitution prescribes that "education is the right of everyone, and shall be given in the home and in the school"; "education in its different branches shall be administered by the public authorities and is open to private initiative, in accordance with the law."

In recent years the federal government has done much to standardize instruction and to articulate the different parts of the educational system. The primary course lasts four or five years. The secondary level—six or seven years—includes two cycles, the first of four years (junior high school, or *ginásio*), followed by a three-year course in a senior high school (*colégio*), where there is an option of a classical or a scientific course. Beyond this are the universities and schools of higher education.

Most of the elementary schools are established, maintained and supervised by the states. In the better urban schools a "fundamental course" of five years is given to children from seven to twelve years of age. "Supplementary" training is offered for adolescents (thirteen and over) and adults. Rural schools have only a three-year course. In 1946, the effective registration in primary schools was slightly over 3 million. It is estimated that about 3.4 million children, or 60 per cent of those between seven and eleven years of age, have no access to schools. Of these, 2.2 million are in rural areas where lack of transportation and the scattered population complicate the problem.

Growth of Secondary Education

Perhaps the most significant development of the last fifteen years has been the expansion of secondary education. In 1932 secondary schools numbered about 200, and their students 56,000. By 1947 secondary schools had increased

to over a thousand and students to 302,000 (255,000 in ginásios and 47,000 in colégios). About 80 per cent of the students were in private schools.

The expansion in vocational education was also striking—from 120,000 to over 600,000 students. The official trade schools are of two types: the industrial schools, which offer four years of trade training, and the technical schools, which in addition to trade training offer two programs: either three additional years of technical training (on the same level as the colégio), which meets university requirements for engineering or teacher-training courses, or two years of additional training to qualify for industry as foremen, etc.

The system of industrial apprenticeship offered by SENAI was discussed in Chapter 7. Commercial education has also developed considerably in the last decade. The Serviço Nacional de Aprendizagem Comercial (SENAC) has been set up to train workers for the commercial professions.

The university system is relatively new in Brazil. The University of Rio de Janeiro was organized in 1931, and in 1937 was converted into the University of Brazil. Instruction is carried on through the various schools or faculties. In addition to the schools included in the universities, independent faculties (that is, colleges) exist in practically every state. The subjects taught in the various faculties and the number of schools devoted to each subject are as follows: political science, administration and finance, 28; law, 22; philosophy, 17; agriculture and/or veterinary, 15; medicine, 12; engineering, 11; pharmacy and odontology, 10; physical education, 9; pharmacy, 7; odontology, 5; liberal arts, 5; music, 5; nursing, 5; architecture, 2; chemistry, 2; mining and metallurgy, 1; miscellaneous, including nursing and social work, library work, various specialized activities, and general studies, 17.

Most of these institutions of higher learning are government-supported. Most are under the jurisdiction of the Ministry of Education, but some (such as the new rural

university) are under the Ministry of Agriculture. The Ministry of Foreign Affairs has recently inaugurated a foreign service training school known as the Instituto Rio Branco.

Affiliated with the University of São Paulo is the Escola Livre de Sociologia e Política de São Paulo, established in 1933. It has undertaken some valuable research projects, and has attracted a staff of unusual caliber, including the well-known sociologist, Dr. Donald Pierson.

Illiteracy Still High

The 1940 census showed that 55 per cent of the Brazilian population over eighteen years of age was illiterate, as compared with 65 per cent in 1920. In an effort to reduce this percentage, the federal government and the states have jointly launched two campaigns in recent years, using the proceeds of the national funds for primary instruction derived from special taxes. One of these provides for the construction of rural schools, of which 2,760 have been built and 1,500 more are scheduled for 1948. The federal government provides the buildings (including residences for the teachers), while the state government pays the teachers' salaries. Books and tuition are free. Each school is designed to handle eighty students, forty in the morning and forty in the afternoon. The program also provides for the construction of forty normal schools in rural areas, since the shortage of qualified teachers is one of the major difficulties. It is perhaps too early to judge the accomplishments of this program; but, in practice, it has been obstructed by local politics and poor local administration in many cases.

In April 1947 the Ministry of Education started its program of adult education with the objective of setting up 10,000 classes for illiterates over fifteen years of age. By the end of the year registration in these classes, plus several thousand additional ones organized by private initiative, totaled 500,000.

Brazilian Students in the United States

A compilation made by the Institute of International Education of New York showed 436 Brazilian students in the United States in 1947, scattered in educational institutions in all parts of the country, enrolled for courses in a wide variety of subjects. A considerable number of students and teachers have received scholarships under grants made possible by the cooperative program of the United States. A large part of the students have been interested in technical fields, such as chemistry, forestry and engineering, and may be expected to use their professional knowledge in the industrial development of Brazil. Others study medicine, dentistry, nutrition and public health. Others specialize in agricultural subjects. Quite a few are interested in public administration and the government services.

The teacher-training program has not been entirely successful, owing either to conflicting ideologies and personalities or to the fact that the trainees at times are unwilling or unable to fit into the local educational framework on their return to Brazil. Some find it more pleasant or more profitable to remain in some phase of "international" activity rather than to take up the practical tasks of education at home.

In view of the interest in study abroad of many students in the United States who do not have the knowledge of the Portuguese language necessary to undertake work immediately in Brazilian institutions, the establishment of an educational center, similar to the American College at Mexico City, would be helpful in expanding Brazilian studies among Americans.

Chapter 10

PUBLIC FINANCE

BRAZIL'S FINANCIAL HISTORY is marked by many periods of budgetary deficits and recurrent disequilibria in the balance of payments. The service on the external debt has at times been a heavy charge on the budget. And since the payments had to be met in foreign currencies, transfers became difficult in times of declining exports and of low world prices for coffee and other tropical products. The budgetary deficits and exchange crises have been partly the cause and partly the result of currency depreciation. Depreciation in turn has been intimately related to the economic and political structure of the country.

The predominance of one or two commodities in the export trade increased the vulnerability of the exchange position. The planter class, long politically dominant, favored cheap money, especially in times of low world prices, since it raised the internal prices of agricultural products. Their expenses in foreign currency were limited, because little machinery or other imported goods were required in their operations. The new industrial employer class has also favored depreciation.

Before 1930 new borrowings had helped to provide exchange with which to maintain the service on the external debt, had stopped the gaps in the federal budget and also had relieved the budgets of the states and municipalities. When this flow was shut off, readjustment in the foreign debt became necessary and other means had to be found for meeting the continuing deficits, which then were met partly by increases in the internal funded and floating debt but mainly by large issues of currency.

Inflationary Trend 1930-1945

The fifteen years of the Vargas government were characterized by large deficits, liberal bank credit and expanding currency circulation. The deficits of the federal budget in the period 1931-1945 amounted to Cr. 8,914 million (say $500 million), not including the special war budget, which was financed by the issue of special war bonds amounting to Cr. 4,308 million (about $220 million).

In 1937 the government launched a program of extensive urban improvements at Rio de Janeiro and at the state capitals. A group of sumptuous new public buildings were erected, and work was begun on a broad boulevard named "Getúlio Vargas" cutting through the heart of the national capital. In 1941 the Bank of Brazil made large loans to the construction industry and to the prefecture of the Federal District for an urban plan. Bank of Brazil loans were also made to private and government-controlled industrial projects, most of which have not yet become remunerative. In 1934 the government instituted its policy of buying gold to increase the metallic reserve. After 1941 funds in local currency had to be found to finance the purchase of the surplus dollar exchange arising from the large export balances and expenditures in Brazil by the United States government. During the ten years 1937-1946 the federal government invested Cr. 13,552 million in gold and foreign exchange holdings.

Currency in circulation rose from Cr. 2,845 million at the end of 1930 to Cr. 4,971 million in 1939 and to Cr. 17,535 million in 1945. Meanwhile sight bank deposits (less cash on hand) increased from Cr. 2,355 million in 1930 to Cr. 7,854 million in 1939 and Cr. 23,955 million in 1945. This meant an increase in means of payment between 1930 and 1945 of Cr. 36,290 million, or 698 per cent.

By early 1945 the government became concerned with the mounting inflation, but little was done to halt the trend until after the change of administration in October of that year.

The budgetary deficit in 1946 reached the record total of Cr. 2,633 million ($132 million), owing partly to the accumulated inflationary pressures inherited from the previous regime and partly to the consolidation into the regular budget of the war and public works budgets, which had for some years been handled separately. In 1947, however, a surplus of Cr. 460 million ($23 million) was achieved, the first surplus since 1927 and the second since 1907.[1]

Revenues

Revenues have increased but until recently they lagged considerably behind expenditures. Receipts of the federal, state and municipal governments in 1940 and 1946 were as follows (in millions of cruzeiros):

	1940	*1946*
Federal government	4,036	11,570
States	2,295	7,052
Federal District	423	1,396
Municipalities	866	1,467
	7,620	21,485

About 87 per cent of the receipts of the federal government come from general revenue taxes. Returns from national properties, income of government enterprises (such as railways, posts, telegraphs and the government printing office), and "miscellaneous" and "extraordinary" income make up the rest. In practice, the last two classes of income are made up principally of taxes and fees earmarked for special purposes. These special taxes and the returns from official enterprises comprise a much larger proportion of the total receipts of the states and municipalities than of the federal government.

1. No attempt is made to discuss the financial position of the states and municipalities. At mid-1948 the most disturbing situation was the deterioration of the financial and credit position of the great state of São Paulo. At that time the state was paying its creditors in bonds, which could be marketed only at a heavy discount.

General Tax Receipts

The receipts of the Brazilian federal, state and municipal governments from general revenue taxes in 1946 aggregated Cr. 16,620 million ($831 million), which is 11 per cent of a national income of Cr. 150 billion (or 13.3 per cent of national income if the lower estimate of Cr. 125 billion is used). This amounts to a tax burden of $17.60 per capita.

The Brazilian Constitution assigns certain sources of revenue exclusively to the union, to the states or to the municipalities. Considered as a whole, the taxes are predominantly indirect. The 1946 tax revenues of Cr. 16,620 million were made up as follows (in millions of cruzeiros):

	Proceeds	*Per Cent of Total*
Consumption	4,009	24.1
Sales and consignments	3,509	21.1
Income	3,100	18.7
Imports	1,404	8.4
Stamp	1,301	7.8
Transfer of property "inter vivos"	837	5.0
Industries and professions	758	4.6
Improved property (urban)	378	2.3
Rural and urban land	288	1.7
License	200	1.2
Export	196	1.2
Inheritance	180	1.1
Amusement	52	0.3
Other	408	2.5
	16,620	100.0

Predominance of Federal Revenues

Of the total tax revenues collected in 1946, the federal government received 61.2 per cent, the states 27.8 per cent, the Federal District 6.2 per cent and the municipalities 4.8 per cent. The penury of the municipalities has grown more acute over the last decade. Most of the municipalities are in an even worse position than these figures show since 44 per cent of the municipal revenues goes to the twenty state

capitals, leaving the other 1,646 municipalities with only 2.7 per cent of the revenues. Some municipalities receive only about 10 cents per capita with which to pay the cost of education, sanitation, transport and other local services!

In an attempt to bring relief to the hard-pressed municipal authorities, the 1946 Constitution made the following changes in the previous allocation of revenue sources:

- The municipalities are to receive part of the revenues from the consolidated tax on liquid fuels and lubricants, minerals and water power.
- The federal government must turn over to the municipalities 10 per cent of the income tax collections (only 5 per cent is being turned over in 1948, but the percentage will be increased in 1949).
- When the revenues from taxes reserved to the states (other than the tax on exports) exceed the total revenues of a given municipality, the state must distribute 30 per cent of the excess to the municipality (this provision is to be carried out gradually over a period of ten years).
- The municipalities are to receive all of the proceeds of the "industries and professions" tax, and 40 per cent of any new tax that may be established.

In 1946 the municipalities received 38.4 per cent of their tax revenue from the industries and professions tax, 15.9 per cent from the license tax (these two taxes are identical in incidence although different in origin; they will probably be merged), 29.0 per cent from urban improvements, 4.8 per cent from urban land, 3.8 per cent from amusements and 8.1 per cent from other sources. The picayune character of some of these taxes is shown by the fact that the collection by municipalities in all Brazil (except the Federal District) from the urban land tax amounted to less than $2 million.

State Taxes

The relative importance of the proceeds of state taxes specified in the Constitution is as follows: transactions, 60.7

per cent; property transfer taxes, 15.7 per cent (transfers between living individuals, 13.4; inheritances, 2.3); industries and professions tax, 7.1 per cent (hereafter reserved to municipalities); rural land tax, 4.3 per cent, and export tax, 4.2 per cent; total, 92 per cent. Other minor taxes—on tobacco and alcohol sales, hotel bills and "agricultural and industrial developments"—amount to 8 per cent of total tax receipts of the states. The transactions or sales tax is usually paid several times before the goods reach the ultimate consumer.

Up to 1937, the export tax was the chief source of state revenue. (In Brazil the term "exports" is applied to any shipment beyond state borders.) The Constitution of 1934 limited export taxes to 10 per cent ad valorem, and the 1937 Constitution prohibited taxes on intermunicipal and interstate exchanges. Interstate taxes, strictly speaking, were finally suppressed in 1943, but in practice the states have fiscal agents on their borders to prevent evasion of sales, stamp and other taxes, thus hampering the easy circulation of merchandise. The Constitution prohibits the levying of export taxes by the federal government.

The 1946 Constitution limited export taxes to 5 per cent, but the federal government was authorized to permit temporary increase up to 10 per cent. In February 1948 the state of Ceará was authorized to collect up to 10 per cent, for three years, on exports from its territory. Shortly thereafter, the state of Maranhão was authorized to maintain for three years the following export taxes: 9 per cent on babassú and tucum kernels, shark fins, rubber, mangrove bark, carnauba wax and hides and skins; 7 per cent on hides and skins of wild animals.

The relative unimportance of the land tax is of interest. Some states exempt small properties and apply the tax at a progressive rate, but on the whole little use has been made of this tax either as a source of revenue or as a means of land reform.

Federal Taxes

The federal government receives most of its so-called "tax revenues" (although part of the "extraordinary" revenues are also derived from special taxes) from four major taxes: consumption, income, import duties and stamp tax. It also collects in the federal territories the taxes of the type reserved to the states. The federal government is allocated about 20 per cent of the sales tax collections in the Federal District.

Import duties were the chief source of revenue through 1939. The consumption tax was established in 1907 and the income tax in 1923. The coverage of the consumption tax steadily increased; in 1940 it occupied first place among the imposts. Its relative importance declined during the next few years, but in 1945 its yield was increased by a revision of the law which put most of the rates on an ad valorem basis. This tax applies to most types of manufactures, including manufactured foodstuffs. It is paid by the domestic producer, as the goods leave the factory, or by the importer, in the case of imported merchandise. Many of the rates are about 50 per cent higher on imported articles, so that the consumption taxes become disguised customs duties.

The income tax was in first place among the federal levies in 1944 but declined to second place thereafter. It has become a major source of revenue in spite of the difficulties in application and collection in a primarily agricultural country like Brazil. In 1945, income taxes were paid by 138,987 individuals and by 248,380 juridical persons (corporations, partnerships, etc.), a total of 387,367. Effective January 1, 1948, the rates have been increased considerably.

The stamp tax applies to most types of documents and business transactions.

The income tax, the stamp tax and the tax on transfers of funds abroad are of special interest to commercial and industrial establishments.

Income Tax. All individuals having net incomes over

Cr. 24,000 ($1,200) and all juridical persons such as corporations, regardless of the size of income, are subject to the tax.

The personal income tax is divided into two parts, one a fixed percentage according to the sources of income (the so-called "proportional") and the other "complementary," which is calculated on the aggregate income from all sources at a progressive rate.

The fixed, or "proportional," rates are as follows:

	Per Cent
Income from registered bonds of public debt, federal, state or municipal	3
Interest on capital and securities, other than the public debt	10
Income from salaries, wages, commissions	1
Other payments for work, such as professional fees	2
Rentals and other income from real estate	3
Income in the possession of corporate bodies	*
Return from agriculture, forestry and animal husbandry	†
All other lucrative occupations	5

* Corporate bodies pay on total income at progressive rates.

† Farmers are exempt from declaration of actual incomes; tax is collected on the basis of an estimated profit of 5 per cent of the value of their property, improvements and equipment, at progressive rates.

These rates are paid on net income in each category, that is, gross income minus authorized expenses.

The "complementary," or progressive, rates apply to the aggregate net income, that is, the sum of the net incomes shown for each category, after making deductions for interest on personal debts, life insurance premiums, losses through *force majeure,* donations and contributions, family support. The progressive rates range from one per cent on incomes between Cr. 24,000 and Cr. 30,000 ($1,200 and $1,500) to 50 per cent on incomes over Cr. 3 million ($150,000).

Companies and juridical persons are taxed on net profits at the following rates: up to Cr. 100,000 ($5,000), 10 per cent; Cr. 100,000-500,000 ($5,000-$25,000), 12 per cent;

over Cr. 500,000 ($25,000), 15 per cent. Public utility enterprises showing a profit not exceeding 12 per cent of the capital invested are taxed at the rate of 8 per cent.

Some income is taxed at the source. For example, interest on bearer bonds of the public debt is taxed 6 per cent; dividends paid on bearer shares and interest on debentures, as well as lottery, race track and similar winnings, are subject to 15 per cent tax deduction at the source. Thirty per cent of the amount paid or credited to firms abroad for use of motion-picture films is considered taxable income, and is taxed at the rate of 20 per cent.

The Brazilian income of individuals or firms residing or domiciled abroad is taxed at the source at the rate of 15 per cent on gross earnings, in addition to the normal taxes on net profits. Profits of foreign branch companies reinvested to expand an industrial installation in Brazil are exempt from this additional tax.

Stamp Tax. In some cases this tax is a fixed amount, in others it is a ratio of the values stated in the documents. Most documents indicating a pecuniary obligation are subject to the stamp tax on the basis of 0.5 per cent of the amount of the obligation.

Tax on Transfers of Funds Abroad. A 5 per cent tax is levied on all transfers except (1) remittances for service of the foreign debt of government entities, (2) payment for certain essential imports, (3) authorized operations between banks, (4) maintenance of the foreign service and (5) remittances of funds for the repatriation of foreign capital invested in Brazil and also for interest payments and dividends, subject to Decree No. 9025 of February 27, 1946.

Taxes of Federal District and Municipalities

The principal tax in the Federal District (as in the states) is the sales and consignments tax. The signed duplicate of sales documents, with *vendas mercantis* stamps attached, is a negotiable instrument known as the *duplicata.* The rate in

the Federal District is 1.8 per cent. The rural property tax is relatively unimportant, but the property transfer taxes are more significant.

The two municipal taxes of concern to merchants and manufacturers are the "industries and professions" tax and the license tax. The industries and professions tax consists of two parts: one is a fixed annual amount established in accordance with the nature and importance of the business, and the other is a variable amount, calculated as a percentage of the annual rent paid by the firm. License taxes are similarly in two parts, one fixed and the other variable. Municipalities also collect a property tax amounting to about 15 per cent of the rental value of urban property.

Many "Nuisance" Taxes

The multiplicity of taxes in Brazil seriously hampers commercial operations, not only on account of the amount of the levies, but also because of the delays and the additional personnel required to look after these transactions. The various taxes on a 60-kilo bag of cocoa shipped from Bahia in 1947 were as follows (in cruzeiros):

Municipal	1.980	
Service	0.342	
Stamp on documents	0.225	
Export license	0.100	
Agricultural	2.500	
Port	2.161	
Sight sales tax	14.196	
Exchange	7.280	
Export tax (12 per cent ad valorem on official value)	64.800	
	93.584	(or about $4.70 per bag)

In the aggregate, the taxes amounted to over 17 per cent of the official value.

Another example is the export of railway crossties from

the state of Pará. The various taxes per crosstie are as follows (in cruzeiros):

Industry and professions	1.585
Sales	1.263
Export (8 per cent ad valorem)	3.443
Ministry of Agriculture—classification	0.585
Instituto Nacional do Pinho	0.487
Rural economy and customs	0.045
	7.408 (or $.37)

In addition, port charges and other fees are paid to the Port of Pará Administration (SNAPP), amounting to Cr. 2.54, whether shipments move through the port of Belém (Pará) or not.

Expenditures

In recent years the military services have been receiving about one third of the annual federal appropriations. Part of these funds are used for civil aviation and the merchant marine.

In addition to the appropriations in the regular budgets, the Ministries of Aeronautics, War and the Navy, as well as those of Finance and Public Works, received large allocations from the special war budgets during 1942 to 1945.

Repatriation of part of the external debt and readjustment of the remainder, effective in 1945, have materially reduced the budget allocations for debt services. The budget for transportation and public works is relatively less in 1948 than twenty years ago. Appropriations for the Ministry of Agriculture are showing a slight upward trend. The Ministries of Education and Health and of Labor, Commerce and Industry are fairly new; together they received 14 per cent of the 1948 budget of Cr. 14.6 billion ($730 million). (See Table 13.)

Fifty per cent or more of recent federal budgets has gone for personnel. Of the remainder of the budget in 1948, 20

TABLE 13

PERCENTAGE DISTRIBUTION, BY MINISTRIES, OF FEDERAL BUDGETARY EXPENDITURES, SELECTED YEARS

Ministry	Actual Expenditures		Budget Authorization		
	1928	1937	1944	1946	1948
Total	100.0	100.0	100.0	100.0	100.0
Military departments	19.6	30.8	32.2	36.5	33.6
Aeronautics	[a]	[a]	6.5	9.4	8.9
War	12.6	20.5	18.5	19.5	16.8
Navy and marine	7.0	10.3	7.2	7.6	7.9
Agriculture (including minerals)	3.4	2.1	2.9	3.8	5.45
Education and health	[a]	5.3	8.17	6.9	10.95
Finance (including public debt service)	43.0	31.8	32.27	30.3	19.05
Justice and interior	7.6	4.4	4.5	6.3	5.15
Foreign affairs	1..6	1.3	1.21	1.0	0.85
Labor, commerce and industry	[a]	1.5	4.3	3.8	3.05
Transport and public works	24.8	22.3	12.75	10.2	19.45
Other	—	—	1.7	1.2	2.45

Source: *Diário do Congresso Nacional,* January 27, 1948, p. 911.

a. Ministry not yet created.

per cent is for maintenance of public service (largely materials), 21 per cent for increases in the national patrimony (buildings, transportation, state industrial enterprises) and about 9 per cent for public debt service. Federal workers were granted a general increase in wages and salaries at the end of 1943 and again at the end of 1945; the 1945 increase cost about Cr. 2,500 million ($125 million).

Budgets of Autonomous Entities

Largely outside of the regular budget are the activities of eighty-one so-called autarquias. The common characteristic of these organizations is their autonomous budgets, including control over their own revenues. The four principal

groups, with budgeted receipts in 1946, were as follows: social security institutes and funds, Cr. 3,695 million; industrial organizations, Cr. 3,071 million; agencies for "economic intervention," Cr. 687 million; organs of popular economy, Cr. 389 million; total, Cr. 7,842 million ($392 million).

Other agencies functioning as autarquias in addition to the Bank of Brazil, some of the railways, the social insurance funds and miscellaneous industrial enterprises are the National Highway Fund, the Merchant Marine Commission and the Institute of Geography and Statistics. Autonomous organs of "economic intervention" include the official cartels of large producers of such products as sugar, alcohol, mate, salt and pine products. The National Coffee Department, now in liquidation, was an autarquia.

Some of the autarquias are organized as corporations, some are regulatory organs or boards. The top officials are designated by the President of Brazil. The "industrial" bodies derive most of their revenue from their own commercial operation; among these are the railways, shipping companies and manufacturing plants. Some are supported by special taxes which are paid over to the autarquias without being included in the regular budget. Some receive regular subsidies from the federal Treasury, and most obtain special grants of funds from time to time. A few, like the federal savings banks, are self-supporting.

A limited number of autarquias are organized as "mixed companies" with participation by private capital. The oldest and most successful of these is the Banco do Brasil. In recent years several important new "mixed companies" have been organized: Cia. Siderúrgica Nacional, Cia. Vale do Rio Doce, Banco de Crédito da Borracha and the Instituto de Resseguros do Brasil (reinsurance). Others recently organized, or in the process of organization, are the Fábrica Nacional de Motores, S. A., Cia. Hidro-Elétrica do São Francisco and Cia. Nacional de Álcalis.

Appraisal of Autarquias

The autonomous form of organization is designed to give greater flexibility and administrative efficiency to activities of a commercial or economic character. On the average, the accounts of the autarquias would appear to be no worse and no better than those of the regular government departments and agencies. A few, like the Banco do Brasil, have become highly respected national institutions. Some of the newer organizations are national scandals.

This whole structure of autonomous enterprises has been criticized on two principal counts: the budgets are outside congressional control, and these activities represent a growing but unfortunate trend toward governmental intervention in economic affairs. Article 73 of the Constitution calls for a single budget; it also provides for review of the accounts of the autarquias by the Tribunal de Contas.

The present administration has shown a disposition to examine more carefully the operation and the financial results of the extensive national enterprises. President Dutra, in his 1948 message to Congress, reported that the government is intensifying its efforts in the economic field. At the same time, he stated, governmental undertakings must not lose sight of the necessity of operating on a strictly industrial or commercial basis, in order that expenses may be covered out of operating revenues.

Most of the autonomous industrial undertakings are operated at a deficit, owing chiefly to excessive personnel and to demands of a noncommercial character on their services, and hence have not been able to make improvements or enlarge operations out of their own funds. Unless these deficiencies can be corrected, the usefulness of the autarquias as agencies of economic development, or even their raison d'être, will be dubious.

Most of the states also have extensive economic interests. The former coffee institute of the state of São Paulo is an outstanding example. The state of São Paulo also owns the

leading bank, the Banco do Estado, besides operating a large part of its railway mileage. The state of Bahia has set up "institutes" operating in the cacao, tobacco and cattle industries and also has an institute of general economic development. In Rio Grande do Sul there are rice, meat and lard institutes; the state government operates the federally owned railways within its borders; it operates a coal mine and fishing enterprises, and has entered the electric power field.

Reasons for Government Intervention

Government intervention expanded greatly during the Vargas regime. The trend has continued under subsequent administrations. The following factors, among others, played a part:

Need for temporary measures to relieve the depression (exchange control, coffee valorization)

Desire to nationalize or Brazilianize foreign-owned enterprises, such as railways, ports, insurance and colonization enterprises

Influence of policies in other countries, particularly the United States

Effect of wartime controls, and the strong military influence on the government, which has been strengthened by joint United States–Brazil defense organizations

Social welfare, such as social security organizations and low-cost housing

In addition, many of the government-controlled enterprises represent attempts to promote projects which private capital is unwilling or unable to undertake. In a country with limited capital and high interest rates, it is argued, government credit must be used to ensure or hasten certain types of development. In practice, however, neither the federal nor the state governments find it easy to raise money, and the cost of government activities to the public may turn out to be

very high. Critics of the present trend point out that types of governmental intervention which may be successful in the countries of western Europe, where the inhabitants possess a high degree of technical and professional skill and are socially mature, are ill suited to Brazil at its present stage of development.

CURRENCY

Brazil inherited the colonial monetary system, with the milreis (divided into one thousand *réis,* plural of *real*) as the effective international unit of currency. In 1942 the cruzeiro of 100 centavos replaced the milreis as the monetary unit (Decree-Law No. 4791 of October 5). No gold content of the cruzeiro was fixed, but by Decree No. 5108 of December 28, 1926 the gold content of the milreis had been defined as 200 milligrams of gold nine-tenths fine, equivalent to 5 31/32 *d.* gold, or to $.2025, United States currency of present weight and fineness, and to $.1196 prior to the devaluation of the dollar.

By Law No. 4791, milreis notes and coins were made convertible into cruzeiro notes and coins at a ratio of one to one, but the conversion has not been completed. Law No. 140 of November 18, 1947 authorized the mint to coin Cr. 64 million ($3.2 million) of new coins of 10, 20 and 50 centavos denominations, to be issued in exchange for damaged paper currency which must be retired from circulation, or substituted for old milreis coins.

The total amount of metallic subsidiary coinage in circulation is not known. From 1942 to 1947, a total of over 600 million coins, valued at Cr. 350 million ($17.5 million), were minted and placed in circulation.

Paper Money Issues

Paper money is now issued exclusively by the national Treasury. Until 1933 the Banco do Brasil had note-issuing privileges, and about Cr. 70 million ($3.5 million) of these old notes were still in circulation at the end of 1947, when a

period of six months from November 1, 1947 was fixed during which these old notes might be turned in without discount. The Treasury has about completed withdrawal of old Caixa de Estabilização notes.[2]

According to Decree-Law No. 4792 of October 5, 1942, paper money may only be issued pursuant to the loan and rediscount operations of the Carteira de Redescontos and the Caixa de Mobilização Bancária, and such issue must have a cover of 25 per cent of government-owned gold and foreign exchange. In practice, a series of legislative acts or decree-laws have authorized the Treasury to take over, for the general account of the nation, large issues of currency originally made through the Carteira or the Caixa, but the requirement of 25 per cent gold or exchange cover is interpreted as applicable to all outstanding currency.

Paper currency in circulation on December 31, 1947 amounted to Cr. 20,399 million ($1,020 million), as compared with Cr. 20,494 million ($1,025 million) a year earlier, showing the first year-end decline since 1933.

Persistent Depreciation

The external value of Brazilian currency has fluctuated considerably over the last century, with a long-run downward drift, but has never been subject to the violent devaluations that have occurred in various other countries. In 1846 the gold content of the milreis was fixed as equivalent to 27 *d.* ($.5463). In practice, the gold standard never became fully operative, but in times of prosperity the milreis went above its nominal gold par. During the financial disorganization accompanying the first decade of the Republic, exchange declined to 7 *d.*, but improved to 16.5 *d.* during the first decade of the twentieth century as a result of the reforms instituted by Minister of Finance Murtinho.

World War I, combined with the overextended financial

2. The Caixa de Estabilização was created by Decree No. 5108 of 1926 to issue notes against gold. It was abolished by Decree No. 19423 of November 22, 1930, which transferred its functions to the Bank of Brazil.

position of the country, caused new exchange difficulties. There was further decline in the 1930's. Although "official" exchange was available at 11.5 milreis to the dollar ($.087 to the milreis), the free rate was around 17.5 milreis to the dollar, or approximately $.06. During 1947 the rate remained steady at Cr. 18.5 to the dollar ($.054 to the cruzeiro), buying, and Cr. 18.72 to the dollar ($.0534), selling. The imposition of a 5 per cent remittance tax from January 1, 1948 brought the effective selling rate to Cr. 19.656 per dollar, or $.0509, on most transactions. For some time cruzeiros have been offered on an unofficial curb market at rates ranging from 21 to 25 cruzeiros per dollar, or $.048 to $.04.[3]

Some degree of exchange control has prevailed continuously since 1931. At times differential rates have been in force for different classes of buyers and sellers. At present all exchange derived from exports must be sold at the official buying rate to authorized banks. Payment for 20 per cent of the exchange is in 120-day Treasury bills bearing interest at 3 per cent. The sale of exchange by authorized banks is subject to regulations of the banking control department of the Banco do Brasil (Fiscalização Bancária).

3. On July 14, 1948 the International Monetary Fund announced the establishment of the initial par value for the Brazilian cruzeiro at Cr. 18.50 per United States dollar ($.0540541 per cruzeiro). The parity for the cruzeiro in terms of gold is .0480363 grams of fine gold per cruzeiro. Brazil continues to collect the 5 per cent remittance tax. The curb rate early in 1949 was around Cr. 27 per dollar.

Chapter 11

BANKING AND INVESTMENT

THE BANKING SYSTEM

BRAZILIAN BANKS have greatly increased in numbers and resources over the last two decades. A large number of banks and banking houses were organized during the early 1940's—many purely speculative. Some had only a nominal capital, and even this small amount, required to make the initial legal deposit, they borrowed. Once organized, they obtained deposits from social security institutes or other semiofficial organizations, either through personal connections or by offering high interest rates. The expansion reached its peak in 1946.

On December 31, 1947 there were 230 banks (main offices) in operation, 212 banking houses (*casas bancárias*), 319 credit cooperatives and 2,200 branches of banks or banking houses, a total of 2,961. As compared with 1946 this represents a slight increase in the number of banks, branch banks and cooperatives but a decline in banking houses. A few small banks closed their doors in 1947. Others were saved only by the energetic action of the authorities.

At the end of 1946 the thirty principal banks had combined deposits of Cr. 39,361 million (about $2 billion). (See Table 14.) This represented 81 per cent of total deposits, Cr. 48,768 million ($2,438 million), in commercial banks. In addition to the commercial banks, there are a number of federal savings banks. Deposits in savings banks amounted to Cr. 6,767 million ($338 million) in 1946. (See Table 15.)

Loans and deposits (omitting Bank of Brazil business with government entities) increased about 5 per cent in 1947 over

TABLE 14

DEPOSITS IN THIRTY LEADING BANKS, DECEMBER 31, 1946

(In Millions of Cruzeiros)

Bank	Deposits
Total for the group	39,361
Banco do Brasil, S. A.	17,028
Foreign banks	3,096
Bank of London & South America Limited	836
The National City Bank of New York	1,205
Banco Nacional Ultramarino	560
The Royal Bank of Canada	495
National banks which operate principally in the Federal District	4,428
Banco Boavista, S. A.	870
Banco do Distrito Federal, S. A.	513
Banco Português do Brasil, S. A.	626
Banco do Comércio, S. A.	393
Banco Financial Novo Mundo, S. A.	634
Banco Hipotecário Lar Brasileiro, S. A.	940
Banco Nacional de Descontos, S. A.	231
Banco da Prefeitura do Distrito Federal, S. A.	221
Banks of the state of São Paulo	6,688
Banco do Estado de São Paulo, S. A.	2,951
Banco do Comércio e Indústria de São Paulo, S. A.	780
Banco Comercial do Estado de São Paulo, S. A.	684
Banco Nacional da Cidade de São Paulo, S. A.	564
Banco Mercantil de São Paulo, S. A.	689
Banco de São Paulo, S. A.	520
Banco Noroeste do Estado de São Paulo, S. A.	500
Banks of the state of Minas Gerais	6,223
Banco do Comércio e Indústria de Minas Gerais, S. A.	1,200
Banco de Crédito Real de Minas Gerais, S. A.	1,453
Banco da Lavoura de Minas Gerais, S. A.	1,098
Banco Hipotecário e Agrícola do Estado de Minas Gerais, S. A.	926
Banco Mineiro da Produção, S. A.	555
Banco de Minas Gerais, S. A.	447
Banco Moreira Sales, S. A.	544
Banks of the state of Rio Grande do Sul	1,898
Banco da Província do Rio Grande do Sul, S. A.	789
Banco Nacional do Comércio, S. A.	659
Banco do Rio Grande do Sul, S. A.	450

Source: Departamento de Estatística e Estudos Econômicos, Banco do Brasil, S. A.

the previous year. The Bank of Brazil holds about one third of the deposits and makes about one third of the loans of all commercial banks. In 1947 its deposits from public entities were Cr. 5,618 million ($280.9 million) out of total deposits of Cr. 18,266 million ($913.3 million); loans to public entities were Cr. 4,472 million ($223.6 million) out of total loans of Cr. 14,115 million ($705.7 million). Bank of Brazil loans (other than to public entities) outstanding at the end of 1946 and 1947 were distributed by economic activity as follows (in millions of cruzeiros):

	1946	*1947*
Total loans	8,922 *	9,517 *
Agriculture, rural industries (e.g., sugar, milk), forest and mineral industries	4,725	4,316
Manufacturing industries (excluding rural industries)	1,555	1,873
Construction industry	143	195
Transportation	287	213
Commerce	1,634	1,872

* Figures and totals from Bank of Brazil reports, uncorrected for errors or omissions.

The Bank of Brazil is not only the leading commercial bank but is also the fiscal agent for the government, which owns about 55 per cent of the shares. It holds government accounts, floats government securities, makes loans to federal, state and municipal governments and agencies and assists in collecting revenues. At the end of 1946 the bank had 267 branches or agencies, including one in Asunción (Paraguay) and one in Montevideo (Uruguay). Eleven new branches in Brazil were opened during 1947.

Many Institutions in One

The bank is really half a dozen institutions in one. Its commercial banking business is conducted through its Carteira de Crédito Geral. The director of this department, as well as two directors responsible for management of the agencies, are named by the stockholders. The bank also

TABLE 15

DEPOSITS, AND LOANS AND DISCOUNTS, COMMERCIAL AND SAVINGS BANKS, 1930-1946

(*In Millions of Cruzeiros*)

Year	Deposits		Loans and Discounts	
	Commercial Banks	Savings Banks	Commercial Banks	Savings Banks
1930	5,731	429	5,961	65
1931	5,961	493	5,893	106
1932	6,843	568	6,697	200
1933	6,344	732	6,954	291
1934	7,419	909	7,406	445
1935	7,766	1,111	7,752	616
1936	8,332	1,338	7,717	772
1937	8,812	1,627	8,599	922
1938	11,665	1,861	9,942	1,042
1939	12,523	2,146	11,282	1,194
1940	13,664	2,418	12,837	1,373
1941	16,532	2,598	15,894	1,500
1942	20,541	2,909	18,206	1,567
1943	31,570	3,592	28,757	1,580
1944	39,703	4,522	40,107	2,026
1945	45,286	5,405	43,860	2,679
1946	48,768	6,767	45,276	4,117

Source: Compiled from annual reports of the Banco do Brasil, S. A.

operates a clearing house for checks. In addition, there are five semiautonomous departments, for which the bank provides housing and general banking functions and which operate under the general supervision of the president of the bank. The directors of these departments, who are also on the directorate of the bank, are appointed directly by the President of Brazil (as is also the president of the bank) or by the Minister of Finance.

These semiautonomous departments are:

1. The Carteira de Redescontos (Rediscount Department), originally established by Law No. 4182 of November 15, 1920, for the purpose of discounting short-term paper and issuing paper currency against such discounts, as does the Federal Reserve System in the United States. It stopped

functioning in 1923, but was reopened at the end of 1930. During succeeding years the eligibility for discount was broadened and limits on operations were raised. It thus became the principal vehicle for the increase of paper money.

2. The Carteira de Câmbio (Exchange Department), which supervises exchange operations and has as its executive organ the office of Fiscalização Bancária, created in 1931 to take over part of the duties of the old inspectorate of banks set up in 1921.

3. The Carteira de Crédito Agrícola e Industrial (Department of Agricultural and Industrial Credit), established in 1936 to provide loans for periods of one to five years for farmers, cattle raisers and industrialists, especially industries using agricultural raw materials. The Treasury subscribed 100,000 contos (roughly $6 million) from funds deposited on the foreign debt. Law No. 454 of July 9, 1937 authorized the Bank of Brazil to issue bonds to obtain funds for the Carteira's operations. These were to be subscribed by the social security institutes, but in practice only about Cr. 75 million was issued. In 1940 loans of the Carteira, under one year's expiration, and guaranteed by rural mortgage or pledge, were made discountable by the Carteira de Redescontos. The Agricultural and Industrial Credit Department also has the use of certain other deposits, including about Cr. 300 million from social security institutions, deposits of public utility companies (Cr. 103 million) and deposits on court order (Cr. 10,020 million). Other resources available in 1947 included Cr. 554 million ($27.7 million) obtained from the Carteira de Redescontos and Cr. 2,582 million ($129.1 million) from the general funds of the Bank of Brazil.

For some years the cattle industry absorbed about 60 per cent of the resources of the department, but this percentage declined somewhat in 1947. Industrial credits outstanding at the end of 1947 amounted to Cr. 794 million ($39.7 million), and in addition there were Cr. 598 million ($29.9

million) in "agro-industrial" credits, principally to the sugar industry.

4. The Carteira de Exportação e Importação (Export and Import Department), established during World War II to implement export and import controls, and to allocate goods.

5. The Caixa de Mobilização Bancária (Banking Mobilization Fund), established by Decree-Law No. 21499 of September 6, 1932 at a time of depression and heavy withdrawals from Brazilian banks, helps to liquidate slow loans. The Caixa is authorized to obtain currency from the Treasury to finance its operations.

The decree establishing the Caixa also contains various provisions relating to the operation of banks in general, such as the authority to determine the minimum capital of banks, permission for branches of foreign banks to operate and similar matters. Also, for the first time, minimum cash reserves (10 per cent for time deposits and 15 per cent for sight deposits) were required of all banks. The powers of banking supervision were later transferred to the Superintendency of Money and Credit, discussed below.

Superintendency of Money and Credit

The executive director of the Superintendência da Moeda e do Crédito (Superintendency of Money and Credit), who is appointed by the President of Brazil, has "the same privileges as those enjoyed by the directors of the Bank of Brazil." The Superintendency, although directly subordinate to the Minister of Finance, has a contract with the Bank of Brazil for the implementation of the Superintendency's functions.

The Superintendency was created by Decree-Law No. 7293 of February 2, 1945, at a time of serious concern about the inflationary situation, "with the immediate purpose of maintaining control over the money market and preparing for the organization of a central bank." (Though the Bank of Brazil fulfills many of the functions of a central bank, other banks are not required to deposit reserves in it, and it is no

longer a bank of issue.) Some of the former functions of the semiautonomous departments of the Bank of Brazil were transferred to the Superintendency. It has the following powers:

1. To request the national Treasury to issue paper currency up to the maximum referred to in Article 2 of Decree-Law 4792 of October 5, 1942
2. To receive deposits of banks (exclusive)
3. To fix, when it deems necessary, the interest rates to apply to new accounts by the banks, banking houses and savings banks
4. To fix monthly the rates for rediscounts and interest on bank loans, different rates of interest being allowed, having in mind the regions and the peculiarities of the transactions
5. To authorize the purchase and sale of gold or exchange
6. To authorize loans to banks for a term of not more than 120 days, guaranteed by securities of the federal government up to a limit of 90 per cent of the value in the market
7. To direct the inspection of banks
8. To direct the policy of exchange and banking operations in general
9. To promote the purchase and sale of securities of the federal government in the market
10. To authorize the rediscount of securities and loans of the banks in accordance with existing legislation

The Superintendency has played a leading part in stabilizing the currency and in stemming inflation. In February 1947 it took over several hundred million cruzeiros from the Bank of Brazil, representing funds which the bank had been holding for the Superintendency but at the same time had included in its own cash position. Later in the year, as money became tight, the Superintendency, through the rediscount office, used these funds to meet the commercial banks' needs

for additional rediscount facilities rather than calling on the Treasury for new currency, as had been the practice in the past. In 1946 the withdrawal of deposits of official and autonomous agencies from private banks and their transfer to the Bank of Brazil was begun. This movement continued during 1947.

Plans for Central Bank

Plans for the establishment of a central bank in Brazil have been discussed at frequent intervals since the first world war. In November 1946 the Ministry of Finance drafted a central bank project and invited criticisms and suggestions. A revised draft, submitted to Congress in June 1947, was the subject of considerable discussion in Congress and in the press. It provided for six specialized banks, in addition to a central bank. The federal government would subscribe the entire capital of the central bank and 50 per cent of the capital of the other institutions. New rural credit and industrial credit banks would absorb the Department of Agricultural and Industrial Credit of the Bank of Brazil, as well as such semiofficial bodies as the Sugar and Alcohol Institute. A mortgage bank, an investment bank and an export-import bank were also proposed.

The main argument advanced in favor of a central bank is that it would have the prestige and the resources to control and mobilize credit, and could provide a market on better terms for government bonds. But the Superintendency of Money and Credit now has the authority to engage in open market operations. The problem of raising the government's credit cannot be solved merely by support of the prices of government bonds by purchases on the part of a central bank.

The project provides that the present Bank of Brazil would be converted into a commercial bank and stripped of its fiscal functions. Some critics object to the dismantling of the Bank of Brazil, which has a good name and established connections, and also to the creation of so many expensive new banks at once.

Activities of Foreign Banks

Branches of several foreign banks do a large business in Brazil, but the relative importance of foreign banks has declined materially since 1921, when dealings in exchange were first brought under official regulation.

The first foreign bank to be established was the London and Brazilian Bank, which opened at Rio de Janeiro in 1862. This was followed by other English, German, Portuguese, French, Belgian, Italian, Dutch and American banks. The heyday of the foreign banks was during the period of large foreign loans and expanding foreign trade and immigration. In 1913 foreign banks held 40 per cent of all bank deposits. The more stringent exchange controls introduced in 1931, the nationalistic trend of the 1930's and the liquidation of the German and Italian banks during the second world war further reduced the relative position of foreign banks.

In October 1947 foreign banks held 7.6 per cent of all deposits and handled 7.3 per cent of the loans of all banks in Brazil. Branches of foreign banks in Brazil now total thirty-eight, of which the Bank of London and South America has fourteen, the Banco Nacional Ultramarino five, the National City Bank of New York four, the Royal Bank of Canada four, the Banco Italo-Belge four, the Banco Holandês Unido three and the Caisse Générale de Prêts Fonciers et Industriels one. The First National Bank of Boston opened a branch at Rio de Janeiro in 1947, and other branches at São Paulo and Santos in 1948.

Interest Rates High

Interest rates in Brazil are three or four times as high as the rates prevailing in most countries. The rediscount rate of the Bank of Brazil is 6 per cent.

A maximum interest rate of 12 per cent was established by Decree No. 22626 of April 7, 1933, but individual lenders and small banking houses collect more through miscellaneous charges and commissions. The maximum rate for loans on

urban real estate guaranteed by mortgage is 10 per cent and on rural real estate or crop loans 8 per cent. The legal rate established by the civil code is 6 per cent.

Interest rates paid by Rio de Janeiro banks on deposits and charges on commercial loans and discount were as follows at the beginning of 1948:

	Large Banks	*Medium-Sized Banks*	*Small Banks and Banking Houses*	
Deposits		(*Per Cent*)		
Unlimited in amount	3	4	4	
Limited	4	4.5	6	
Fixed-term	4.5	7	8	
Loans and discounts	8-10	10-12	12	(plus ½ per cent commission)

The Bank of Brazil and the branches of American banks pay a somewhat lower interest on deposits than most other banks. The Bank of Brazil rates at the end of 1947 were as follows: unlimited, 2 per cent; popular deposits (limited to Cr. 10,000), 4.5 per cent; fixed-term deposits, 4 per cent on six-months' term and 5 per cent on twelve-months'. Interest rates charged by the Bank of Brazil vary between 6 and 9 per cent.

Interest rates have remained relatively stable for some time. The chief reasons for the high rates are the large profits obtained by commercial and industrial enterprises and the long-run tendency toward depreciation of the Brazilian currency.

Savings and Investment Channels

Annual savings in Brazil are estimated at Cr. 10 billion ($500 million), or between 7 and 8 per cent of the national income. This is, at best, a rough estimate and probably does not make sufficient allowance for savings in the form of improvements made to urban and rural properties by the owners.

Estimated savings are made up as follows (in millions of cruzeiros):

Collective savings (net)	4,518
Insurance	1,807
"Capitalization" (real estate)	191
Social security institutes and funds	1,425
Federal saving banks (increase in deposits 1946)	1,095
Nondistributed earnings	1,814
New investments in companies	3,579
	9,911

Real Estate Investments and Speculation

Real estate has absorbed large amounts of capital in recent years. New office and public buildings, hotels and apartment houses have transformed the skylines of the principal cities, especially Rio de Janeiro and São Paulo, and attractive new suburbs of garden villas have appeared. The so-called capitalization, or investment, companies, which sell homes on the time-purchase plan, have had a large development. Most of these conduct periodic lotteries whereby the winners redeem their holdings without further payments. Banks and banking houses, operating with funds attracted by high interest rates on deposits, finance builders and speculators by renewing short-term loans.

Many new apartment houses have been built on the "cooperative" basis. Frequently apartments change hands several times before the building is completed. Changing social conditions and family circumstances have caused many families to sell residential properties and invest the proceeds in a condominium (cooperative).

The real estate boom reached its peak in 1946. Since then restrictions on credit, increased taxation on real estate profits, and material and labor shortages, have slowed down new construction. A serious shortage of housing still exists, but

the enforcement of rent controls since 1942 decreases the attractiveness of rental property. In practice, however, the law is evaded in the case of new tenants by requiring a cash premium, or *luva,* which may amount to a year's rental.

Prices of both rural and urban properties have risen tremendously since 1939. Sites in the banking district of São Paulo cost from $150 to $200 a square foot. Lots in a high-class residential suburb bring from $3 up a square foot. Industrial sites near Baurú (São Paulo), a city of 50,000 inhabitants and an important railway junction, are quoted at $2,000 an acre. Rural land in the interior of São Paulo State, distant from railway or highway, is priced at $8 to $17 an acre.

Life Insurance

Insurance coverage has increased considerably in recent years. One large company, the Sul América, organized in 1895, handles about 70 per cent of all the life insurance written in Brazil. It is estimated that from 400,000 to 450,000 persons are covered by life insurance, including about 100,000 covered by group insurance, which has developed rapidly since 1929. These figures do not include insurance provided by IPASE, an association of government employees, nor by the social security institutes.

Sul América's new policies during the five years ended 1946 amounted to $200 million. Assets of the company in 1946 were distributed as follows: public debt, 37.45 per cent; other securities, 8.91 per cent; real estate, 15.41 per cent; loans on mortgages, 17.49 per cent; loans on policies, 5.87 per cent; loans on other security, 0.12 per cent; cash, 3.33 per cent; time deposits, 3.42 per cent; other, 8.00 per cent.

Corporate Organizations

Individually owned enterprises and those owned by family groups are relatively more important in Brazil than in the United States. In 1946 there were 3,863 stock companies in

Brazil, having a total capital of Cr. 27,632 million ($1,381 million), of which 3,666 were Brazilian and 197 foreign. The capital of foreign companies applied to Brazilian operations was given as Cr. 3,601 million ($180 million). These figures are, however, misleading, since the capitalization of both Brazilian and foreign companies is usually small in relation to the business done.

A large number of stock companies have been organized during the last two years, and the total is now estimated at about 7,000. Changes in income tax laws have been an important factor, as have the growth and complexity of industrial organization. During the six years 1942-1947 new issues of corporate stock in the Federal District (roughly one third of the national total) amounted to Cr. 11,102 million. Reduction in capital during this period totaled Cr. 330 million, leaving a net of Cr. 10,772 million. Only Cr. 4,020 million consisted of new money, the rest being accounted for by the incorporation of reserves into capitalization. The law forbids reserves larger than capital, and the income surtax added an incentive.

Debentures issued from 1942 to 1947 amounted to Cr. 1,120 million, which is included in the totals given above. These were issued chiefly by public service and real estate companies. The issuance of debentures increased somewhat in 1947, as the profit rate declined.

Generally speaking, shares of stock companies are held by a few individuals, frequently members of one or two family groups, or by foreign concerns. Shares in large and profitable companies like the Banco do Brasil (20 per cent dividend in 1947) and the Sul América group (insurance and real estate investments) change hands very infrequently. The shares of only about a dozen or so companies are actively traded.

The Paulista Railway, which has not missed a dividend in seventy years but has passed the peak of its earning power (annual dividends in recent years have been 7 per cent), has about 7,000 stockholders. The Paulista has long raised new

capital required to expand its operations or to improve its installations by appealing to small investors rather than to investment organizations. The Mogiana Railway in 1947 had 2,860 stockholders, of whom 1,221 were women. More than one sixth of the shares of the Mogiana change hands annually.

Stock Exchanges

The annual total turnover of securities in the Brazilian stock exchanges during 1937-1946 was as follows (in millions of cruzeiros):

	Rio de Janeiro	*São Paulo*	*Total* *
1937	445	248	710
1938	453	271	738
1939	508	274	797
1940	580	330	934
1941	779	354	1,167
1942	747	496	1,306
1943	1,018	672	1,749
1944	953	595	1,605
1945	995	798	1,841
1946	1,069	843	2,003

* Includes movement at the following exchanges: Pôrto Alegre, Recife, Vitória and Santos. New exchanges are being opened at Belo Horizonte and Salvador.

By types of securities the movement was as follows (in millions of cruzeiros):

	Government Bonds			*Shares and Debentures*
	Federal	*State*	*Municipal*	
1937	305	283	40	82
1938	284	286	73	95
1939	276	302	94	125
1940	318	341	103	172
1941	407	432	95	233
1942	324	462	127	393
1943	366	591	132	660
1944	523	420	100	562
1945	814	435	63	529
1946	1,087	341	73	502

The stock exchange turnover declined about 19 per cent in 1947 as compared with 1946, as will be seen from the following figures (in millions of cruzeiros):

Stock exchange	*1946*	*1947*
Rio de Janeiro	1,069	818
São Paulo	843	759
Pôrto Alegre	59	27
Recife	16	15
Santos	16	6
	2,003	1,625
Types of securities		
Public	1,501	948
Federal	1,087	586
State	341	312
Municipal	73	50
Private	502	677
	2,003	1,625

The turnover in shares and debentures of stock companies increased in 1947 compared with 1946, but a decline in the movement of government bonds resulted in a net reduction. The quotations for government bonds declined during 1947, owing principally to the upward trend of income tax rates, fears of currency devaluation, and the tight credit situation. Competition with long-term issues was also provided by the large offering of Treasury bills in which exporters are paid to the equivalent of 20 per cent of the proceeds of their shipments. These bills, of which around Cr. 1,250 million ($62.5 million) are usually outstanding, went at prices giving a return of between 9 and 18 per cent a year.

New stock companies are required by Decree-Law No. 9783 of September 6, 1946 to apply to the nearest stock exchange for listing of their shares and debentures. Existing companies were given ninety days to take similar steps, but this time limit was subsequently extended.

Brazil's stock exchange officials are anxious to attract some

American investment in listed stocks and bonds, not only for the additional funds it would bring into Brazil but also because it would stimulate greater interest among Brazilians in stock and bond investments. Officials of the Rio, the São Paulo and the Pôrto Alegre exchanges participated in the First Hemispheric Stock Exchange Conference held in New York City on September 15-18, 1947. In the long run, purchases of equities by American citizens may become an important form of foreign investment, but the general public will hardly be attracted until higher standards of accounting and disclosure to stockholders are put into effect.

Foreign Interests in Brazil

There has been a large inflow of capital since Brazil became an independent nation. The English held the predominant position until recent years. During the nineteenth century all federal public loans (and nearly all state and municipal loans) were issued in sterling through the government's fiscal agent in London, although coupons were made payable in francs and other currencies. Great Britain was the chief source of import merchandise, and occupied a dominant position in shipping, banking and communications. The British played an important part in developing ports, railways and public utilities. French and Belgian investors and promoters also played a substantial role. Some large franc loans were placed between 1908 and 1910, and the French became interested in railways, banks and miscellaneous enterprises.

German investments began to attain importance by the 1890's, principally in shipping, trading and banking. Resident Germans became active in practically every state, in farming, in manufacturing, in wholesale and retail trade and in export houses handling such products as cacao, tobacco, coffee, hides and rubber—all of which found a good market in Germany.

A Canadian company developed the most important electric

power enterprise in Brazil, which serves the populous Rio–São Paulo area.

The United States early developed a large trade with Brazil, and individually Americans played an important part in economic—and scientific—developments. The United States investment, which was estimated at only $40 million in 1914, expanded rapidly after World War I.

Total foreign investments in Brazil in 1930 have been estimated at $2,628 million, of which the British held slightly over half and the United States one fifth.[1]

The value of foreign investments has shrunk considerably since 1930 as the result of many factors, among which are the readjustment of the public debt; sales or expirations of concessions; naturalization of former aliens; and liquidation of German, Italian and Japanese holdings during the war. At the same time, the value of American "direct investment" has increased, partly as the result of the reinvestment of profits.

Brazil's Foreign Debt

Brazil has been a fairly continuous borrower abroad since the first English loan was made in 1824. No new bonds in foreign currencies have been placed since 1930 except for funding arrangements and readjustments. In 1930 the foreign debt was as follows (in millions of currency units):

	Pounds	*Francs*	*Dollars*	*Florins*	*Total in Pounds*
Federal government	99.8	1,262.7	147.4	—	141.2
States	50.6	227.5	157.5	10.7	86.6
Municipalities	10.7	50.0	68.3	—	25.5
Total in currency of issue	£ 161.1	Frs. 1,540.2	$373.5	Fl. 10.7	£ 253.3
Total in dollars	$805.6	$61.6	$373.5	$4.3	$1,266.5

Source: Instituto Nacional de Estatística, *Anuário Estatístico do Brasil,* Ano II (1936), Rio de Janeiro, p. 408. Not adjusted for errors or omissions.

1. See George Wythe, *Industry in Latin America,* Columbia University Press, New York, 1945, p. 154.

In 1930, service on the external debt of the government entities amounted to approximately $100 million. The federal government expended nearly 40 per cent of its budgeted revenues on debt service.

Before the 1930's the Brazilian government had avoided complete default on its foreign obligations, although on several occasions it had been forced to suspend cash remittances and resort to fundings (in 1898, 1914 and 1931). In practice, the maintenance of debt service was frequently made possible by new borrowings. Under the Aranha plan of 1934 foreign exchange was allocated to meet partial service on the foreign debt. After a period of default in 1938 and 1939, a unilateral plan was announced in 1940 for payments on a scale lower than that prevailing under the Aranha plan. Following protracted negotiations, an agreement for complete revision of the debt was reached in 1943 with the Foreign Bondholders Protective Council, Inc., of New York, and the Council of the Corporation of Bondholders, of London, whereby bondholders were offered a choice between two plans. Plan A provided for a reduction of interest to an average rate of 2.49 per cent and for an extension of the maturity of the original bonds, the principal remaining unchanged. Plan B established an average reduction of 37 per cent in the original value of the bonds, compensated by cash payments, a uniform interest rate of 3.75 per cent, amortization over twenty-three years, and responsibility for debt service on state and municipal bonds transferred to the federal government. The so-called Grade VIII bonds, of which £ 7,241,948 and $1,980,000 were outstanding in 1943, were retired against cash payments equivalent to 12 per cent of their face value.

Under this arrangement, the annual service on the sterling and dollar bonds was reduced to about $32 million annually.

An agreement with the French bondholders was concluded on March 9, 1946 whereby 60 per cent of the proceeds of

Brazilian exports to France over a two-year period was to be placed in a liquidation account up to $19,320,000 United States currency, for disbursement by the French government in settlement of French loans and claims. The full amount of this fund was constituted during 1947, and the bonds will be retired as soon as the French government completes the process of taking up the bonds.

Brazil has also been negotiating with the Dutch government for the retirement of the 1921 São Paulo 8 per cent issue with a nominal value of 6,428,100 florins.

Classification of Debt

Brazil's external funded debt in circulation on December 31, 1947 was as follows (in millions of currency units):

	Plan A	*Plan B*	*Total*
In United States dollars	110.5	87.7	198.2
Federal	52.5	54.1	106.6
State	30.3	17.5	47.8
Municipal	19.8	13.2	33.0
Special loans *	7.9	2.9	10.8
In sterling	60.2	38.6	98.8
Federal	44.8	27.8	72.7
State	7.5	5.5	13.0
Municipal	1.8	2.2	3.9
Special loans *	6.1	3.1	9.2
French			
Gold francs—federal			229.2
Paper francs			519.5
Federal			272.9
State			225.1
Municipal			21.5
Dutch florins—state (São Paulo)			6.4

* Coffee realization loan and loans to Instituto de Café of São Paulo and the Banco do Estado de São Paulo.

This made the total external funded debt approximately $670 million. The equivalent in Brazilian currency was Cr.

12.4 billion. The internal debt was as follows (in billions of cruzeiros):

Federal consolidated debt	10.0
Federal floating debt	4.2
Consolidated debt of states *	6.4
	20.6

* Floating debt of states and municipalities not available.

The total public debt, therefore, amounted to Cr. 33 billion (roughly, $1,650 million), from one fourth to one fifth of the national income.

To this total must be added obligations to United States official agencies, as follows (in millions):

Export-Import Bank loans outstanding	$91.0
United States Maritime Commission credit	6.2
Foreign Liquidation Commission	6.4
Lend-lease settlement	35.0
	$138.6

Servicing the Debt

The 1948 federal budget provided for debt service as follows: external debt, Cr. 383.7 million; consolidated internal debt, Cr. 570.0 million; floating debt, Cr. 330.0 million; total Cr. 1,283.7 million—equivalent to 8.8 per cent of the total budgeted expenditures for 1948. This contrasts sharply with the nearly 40 per cent of the budget required to service external and internal debts in 1930.

Service on the external debt of the states and municipalities in 1948 was scheduled at Cr. 167.8 million by the states and Cr. 42.8 million by the municipalities. Under Decree-Law 6019, the federal government is not responsible for Plan A dollar or sterling bonds of the states and municipalities, nor for Plan A "special issue" securities.

Nationalization of Former Foreign Holdings

Some important properties have been nationalized. Of the railways, the federal government has taken over the

Brazil Railway (1940) and its subsidiaries, the Vitória a Minas Railway (1941), the São Paulo–Paraná Railway (1943), the São Paulo Railway, now the Santos-Jundiaí (1946), and the Bragantina Railway (1948). It appears likely that the Great Western, the Leopoldina and the Estrada de Ferro de Ilhéus a Conquista will be taken over in the near future. The Amazon Steam Navigation Company and the Port of Pará were nationalized in 1940. The Ford Motor Company sold its rubber plantations on the Tapajós River to the Brazilian government for the cruzeiro equivalent of $250,000, after having spent an estimated $15 million.

The Ulen Company gave up its power management contract at São Luís de Maranhão, and the federal government took over the British-owned power plants at Belém (1947) and Fortaleza (1948). As a war measure, to expedite arrangements for shipment of iron ore, the British government bought out the private shareholders of the Itabira Iron Ore Company and donated the property to the Brazilian government. The large and skillfully planned colonization project of the Paraná Plantations, Ltd., in northwestern Paraná, was Brazilianized. Brazilians acquired majority control of the Panair do Brasil, S. A. (the leading airline), Aerovias Brasil and the Belgo-Mineira (steelworks, iron mines, timber properties, etc.), and bought out a few other enterprises, such as the shops of the Pullman-Standard Car Export Corporation near Rio de Janeiro.

Present Foreign Investments in Brazil

The value of foreign investments at present is probably in the neighborhood of $1,500 million, of which the British have $550 or $600 million, Americans $450-500 million, Canadians $200 million, and the French, Belgians, Portuguese, Dutch, Swiss and Argentines lesser amounts.

Brazilian assets owned in the United States amounted to $334.7 million on May 31, 1943, according to an official census taken on that date. (See Table 16.) The largest item

TABLE 16

VALUE OF BRAZILIAN ASSETS OWNED IN THE UNITED STATES, BY PROPERTY TYPE AND TYPE OF OWNER, MAY 31, 1943

(In Millions of Dollars)

Property Type	Type of Owner: Individuals: Citizens of United States	Individuals: Non-citizens of United States	Corporations: Controlled in United States [a]	Corporations: Controlled abroad [a]	Estates and Trusts	Total
Total	43.1	6.7	270.8	8.5	5.7	334.7
Interests in controlled enterprises [a]	1.9	.7	230.3	3.4	—	236.1
Bullion, currency and deposits	1.0	.5	.9	[b]	.2	2.6
Securities	35.9	3.9	7.0	.1	5.5	52.6
Government obligations	33.8	3.5	6.7	.1	5.4	49.6
Government-guaranteed obligations	[b]	[b]	[b]	—	[b]	.1
Corporate bonds	.2	[b]	.1	—	[b]	.3
Corporate shares and others	1.9	.4	.2	—	.1	2.6
Receipts and claims	1.2	.6	26.8	4.7	[b]	33.5
Notes	.1	[b]	8.8	[b]	[b]	9.0
Accounts receivable	.3	.3	14.3	4.3	—	19.3
Other claims and demands	.8	.3	3.7	.4	[b]	5.2
Personal property	.5	.5	3.3	.3	—	4.5
Merchandise and equipment [c]	.3	.5	3.3	.3	—	4.4
Jewelry and objects of art	.2	[b]	—	—	—	.2
Real property	2.0	.3	2.2	—	[b]	4.5
Land and buildings for personal use	1.4	[b]	.3	—	—	1.7
Land and buildings for other than personal use	.6	.3	1.6	—	—	2.4
Mortgage and other rights	[b]	[b]	.3	—	[b]	.4
Interests in estates and trusts	.6	[b]	—	—	—	.6
Life insurance policies and annuities	[b]	[b]	—	—	[b]	[b]

Source: Census of American-Owned Assets in Foreign Countries, Office of the Secretary, United States Treasury Department, 1947, p. 119.

a. For statistical purposes only, control was determined on the basis of the ownership by one person or by an affiliated group of persons of 25 per cent or more of the voting stock of corporations, and analogous interests in partnerships and other organizations.

b. Less than $50,000.

c. Including liens on and claims to merchandise and equipment.

in this total represented interests in controlled enterprises. Classified by type of business, these were distributed as follows: manufacturing, $66.4 million; mining and smelting, $2.5 million; petroleum distributing, $30.2 million; public utility and transportation, $87.8 million; agriculture, $10.1 million; trade, $29.2 million; finance, $3.5 million; miscellaneous, $3.1 million, and nonprofit organizations, $3.5 million; total, $236.1 million.[2]

The second largest item in the United States holdings consisted of securities, principally governments ($49.7 million), although corporate bonds and shares amounting to $2.9 million are shown, or $52.6 million in all. This was the market value. The par value of the government bonds was as follows: federal government, $52.2 million; state, $42 million; municipal, $24.8 million; total, $119 million.[3]

This census does not include the loans, credits and investments of the United States government, mentioned above.

British Holdings

The largest item of British investment was government bonds. According to statements made in the Brazilian Chamber of Deputies, there has apparently been some repatriation of these bonds since the end of 1946, when the par value was given as £ 105 million. Allowance must also be made for the possibility that not all of the bonds are held by citizens of the United Kingdom. The market value in May 1948 was £ 66.5 million.

Other British investments are estimated by the *South American Journal* (London) at around £ 85 million, on the basis of the par value of securities listed on the London

2. *Census of American-Owned Assets in Foreign Countries,* United States Treasury Department, Office of the Secretary, Washington, D. C., 1947, Table 2, p. 70. The figures have been rounded and do not add precisely to the total. See Appendix 1 for a list of the leading American interests in Brazil. The United States investment in controlled enterprises in Brazil has increased substantially since 1943 and is now estimated at over $350 million.

3. *Ibid.,* Table 8, p. 82.

Stock Exchange, but it is doubtful whether this makes ample allowance for disinvestment in recent years. British holdings —railways, shipping, lands—have been affected more than those of any other nationality by the changes of the last decades. However, investment by London companies and by resident British are still extensive. (See Appendix 2 for a list of leading British companies.)

New undertakings by British firms in recent years are limited, but the De La Rue insulation concern is reported to control half of De La Rue Plasticos do Brasil, which completed a plastics manufacturing plant at São Paulo in 1948.

Partially offsetting British investments are the frozen Brazilian credits (arising out of Brazilian shipments during the war), which amounted to £ 61.5 million on March 31, 1947 but had been reduced to £ 50 million at the time an Anglo-Brazilian trade and payments agreement was signed on May 21, 1948. This agreement made provision for the establishment of special accounts, bearing interest at one per cent per annum, pending the liquidation of the credits through trade or otherwise. Funds from these accounts may be used for the following purposes:

1. The repatriation of Brazilian sterling loans (federal, state or municipal), whether in the form of special purchases or in repayment of specific sterling issues
2. The total payments in respect of the taking over by the Brazilian government of the São Paulo Railway Co., Ltd.
3. Payments in respect of such other British-owned railways or utility companies operated in Brazil as the Brazilian government may decide to purchase by agreement with the entities concerned, or to take over under the terms of respective contracts
4. The settlement of amounts the Brazilian government or the Brazilian courts may determine to be due to

persons or companies resident in the United Kingdom in respect of claims presented by April 1, 1947

5. The purchase of buildings for the Brazilian Embassy and Chancellery, up to a maximum of £ 250,000

Investments of Canada and Other Countries

Canadian investments are concentrated in a few large enterprises, such as Brazilian Traction, Light and Power Co., Ltd.,[4] branches of the Royal Bank of Canada, and the Perus cement plant in the state of São Paulo. Brazilian Traction, or the "Light," as it is known in Brazil, controls a number of subsidiaries which furnish light, power and traction in Rio de Janeiro, São Paulo, Santos and other cities, telephone services in an extensive area, and gas and water in several places. Recently Aluminium, Ltd., has become interested in an aluminum plant to be erected at Mogi das Cruzes (São Paulo). There is also Canadian capital in mining properties.

It is difficult to identify distinctively French holdings and those of French citizens who have become naturalized in Brazil. French influence is still important in the larger cities, and the French language is widely taught in the schools, especially in private schools for girls.

The largest Portuguese interest is the Banco Nacional Ultramarino, but individual Portuguese who retain their nationality are very active in many fields, particularly in the provisions trade, commerce and real estate.

The Dutch have the Banco Holandês Unido, S. A. There is a Dutch colony in Paraná.

The founder of the Sul América life insurance company, the largest in South America, was a Spaniard. His family still has the predominant interest in it.

There is Argentine capital in flour milling and vegetable oil production, and miscellaneous enterprises in the southern states.

4. This company is organized in Canada and the largest bloc of stock is held by Canadians, but shares are also held in the United Kingdom, continental European countries and the United States.

Increasing Representation of United States Firms

American investment in manufacturing operations, through branch plants or participation in Brazilian enterprises, has grown since 1930. Among the lines represented are tires, pharmaceutical and toilet preparations, radios, abrasives, bandages, paint, heat-resisting glass, ice cream, starch and tapioca, chemicals, chewing gum, steel drums, railway cars, tin containers and sprinkler systems. Other established companies, such as General Motors, General Electric, Gilette razor, and chemical and pharmaceutical concerns, have expanded operations.

The Westinghouse Electric International Company early in 1949 announced the conclusion of a long-term licensing agreement with Eletromar, a Brazilian manufacturing company, whereby Westinghouse will provide engineering assistance in the design and construction of the Brazilian plants, and will train key Brazilian personnel in Westinghouse factories in the United States. In 1948 a subsidiary was established and subcontracts awarded for the assembly of Philco radios and the manufacture of some parts and cabinets locally. Some assembly of International Harvester trucks is carried out in that company's new buildings at Rio de Janeiro and Santo André (São Paulo).

The petroleum companies have expanded distribution facilities. Aviation companies, particularly Pan American Airways, established airports and installations and pioneered new routes. Telephone and utility companies installed new equipment. The American and Foreign Power Company increased its investment by $17 million between 1945 and 1948. Sears, Roebuck and Company has bought sites in Rio de Janeiro and São Paulo, and is proceeding with plans to open stores in those cities. Resident American citizens have been outstandingly successful in various ventures in merchandising and service operations. The National City Bank opened a new branch at Pôrto Alegre on October 4, 1948. The First National Bank of Boston began operations

at Rio de Janeiro in 1947, its authorization being contingent upon its bringing into Brazil the sum of Cr. 100 million ($5.4 million).[5]

In the late 1930's and the early war years there was a considerable influx of European refugees, some of whom brought considerable capital and started new enterprises.

It should also be pointed out that there are Brazilian investments abroad. Individuals and firms maintain substantial deposits in United States banks and also own stock, bonds and real estate.

Limitations on Foreign Enterprise

Legal limitations restrict the business operations of foreigners in Brazil, particularly in mining, the extraction of petroleum and insurance. There are fewer restrictions in the case of either manufacturing or agricultural enterprises. At the same time public sentiment would probably not be favorable to large foreign operations in certain fields. For example, Belgo-Mineira, the largest charcoal-furnace ironworks, has been Brazilianized, although Belgians and Luxemburg citizens hold about 48 per cent of the stock and provide most of the commercial and technical staff. The majority of the stock of the new National Steel Company at Volta Redonda is held by the federal government. The military authorities have an active interest in various chemical products.

Exchange regulations are discussed in Chapter 12.

Property and Concessionary Rights

Before 1934, mines belonged to the proprietor of the soil, and, generally speaking, could be worked with a minimum of formalities or controls. In 1931 provision was made for federal authorization of exploration and exploitation of mineral deposits, and in 1933 a mining bureau (today the

5. Conversion is made here at the official buying rate of Cr. 18.38 to the dollar.

Departamento Nacional da Produção Mineral) was set up in the Ministry of Agriculture. The Constitution of 1934 introduced the following changes:

1. The federal government was given primary powers to legislate in connection with minerals, mining, metallurgy, subsoil deposits, water rights and hydraulic energy, without excluding the authority of the states to supplement federal legislation in certain particulars (Article 5, Section 3).
2. Mines, subsoil deposits and waterfalls constitute property distinct from the soil (Article 118).
3. The industrial utilization of minerals, waters and hydraulic energy is subject to federal concession or authorization (Article 119).
4. Such concessions will be granted only to Brazilians or companies organized in Brazil, reserving to the proprietor preference in the development or coparticipation in the profits (Article 119).
5. "The law will regulate the progressive nationalization of mines, mineral deposits, and waterfalls or other sources of hydraulic energy and industries, judged basic or essential to the economic or military defense of the country" (Article 119).
6. Already developed waterfalls and mines do not require concession, "although temporarily suspended" (Article 119). At the same time, transitory Article 12 provided for possible revision of existing contracts and rights.
7. Federal law shall regulate the control of rates charged by concessionary companies, to assure that profits do not exceed a just return on capital, after making allowances for expansion and improvements.

A mining code was also enacted in 1934 (Decree No. 24642, October 7). This, in turn, was revised by the mining code of 1940 (Decree-Law No. 1985, January 29).

The 1937 Constitution repeated the substance of the 1934 provisions, except in two particulars: first, it changed the earlier requirement that concessions could be given only "to Brazilians, or to companies organized in Brazil," to read, "to Brazilians, or to companies composed of Brazilian shareholders" (Article 143, I); and, secondly, it omitted the provision calling for revision of pre-existing concessions.

The 1946 Constitution liberalized the conditions as compared to 1937. It provided that mineral and water-power concessions could be granted only "to Brazilians or to companies organized in the country, assuring the proprietor of the soil preference in the exploration" (Article 153, I). It omitted reference to progressive nationalization. A new mining code has been drafted by an official commission, but it had not been submitted to Congress at the time this study was completed.[6] However, the government has granted exploratory and development concessions to foreign-controlled companies organized in Brazil under Brazilian legislation and having their main office in Brazil.

Petroleum

Petroleum came in for special attention in 1938. On April 11 an additional title (Decree-Law No. 366), relating to petroleum and natural gases, was added to the mining code of 1934. This measure declared such deposits to be the property of the nation. It authorized the government to set aside petroleum reserves, and to enter into contracts with national or foreign companies for drilling and extracting oil. On April 29 the supplying of petroleum was declared a public utility (Decree-Law No. 395). "Supplying" is defined by the decree-law as including production, importation, transportation, distribution and commerce of crude petroleum and its derivatives, as well as the refining of pe-

6. By Decree-Law No. 6230 of January 29, 1944, the President was authorized to permit mining companies to have half of their capital constituted by bearer shares as long as the other half be nominative shares owned by Brazilians.

troleum, whether imported or national. The federal government is given exclusive power to authorize such activities. The refining of petroleum is to be confined exclusively to Brazilian-controlled organizations. The decree also authorized the creation of a National Petroleum Council (Conselho Nacional do Petróleo), which was further regulated by Decree-Law No. 538 of July 7, 1938. On December 8 the Recôncavo area of Bahia, where petroleum was discovered, was declared a national reserve.

By decree-laws in 1939 and 1941, the jurisdiction of the National Petroleum Council was further confirmed (No. 1217, April 24, 1939, and No. 1369, June 23, 1939), and petroleum law was separated from the mining code (No. 3236, May 7, 1941). A draft of a new petroleum code was submitted to Congress by the President just before Congress adjourned in February 1948. (See Chapter 6.)

Water Power

The Vargas regime tightened official control over water power through the enactment of a water code (Decree No. 24623, July 10, 1934, as amended by Decree-Law No. 852, November 11, 1938). The Conselho Nacional de Águas e Energia Elétrica was established in 1939. The restrictive features of the water code slowed down power developments for several years, but a more favorable attitude toward established enterprises developed in 1942. On May 13 Constitutional Law No. 6 was published in the *Diário Oficial,* amending the first paragraph of Article 143 of the 1937 Constitution, as follows:

> The authorization shall be granted only to Brazilians or to enterprises composed of Brazilian shareholders, the government being enabled in each case, as a measure of public convenience, to permit the utilization of waterfalls and other sources of water power by enterprises which now make use thereof under the protection of paragraph 4, or to those which organize as national companies, preference in the exploitation or participation in the profits always being reserved to the proprietor.

Other Regulations Affecting Foreign Enterprise

The 1934 Constitution provided for the "progressive nationalization" of banks and insurance companies (Article 117) and prohibited ownership of newspapers and political journals by foreigners or stock companies with bearer shares (Article 131). The 1937 Constitution liberalized this to some extent by providing that "banks of deposit and insurance companies already authorized to operate in the country will be given a reasonable period in which to comply with the requirements of this Article" (Article 145). The date of July 1, 1946 was set in 1941 as the deadline beyond which banks of deposit could continue to operate only if all of their stockholders were Brazilian citizens (Decree-Law No. 3182, April 9, 1941), but this time was later extended indefinitely. The present Constitution provides: "The law shall regulate the system of banks of deposit, insurance companies, capitalization companies, and the like" (Article 149). In the proposed banking law (see page 286) the provisions concerning foreign banks are fairly liberal. There has, however, been some discussion of a proposal to require all banks to be organized as Brazilian companies.

A significant development in the insurance field was the creation of an official reinsurance organization in Brazil—Instituto de Resseguros do Brasil, created by Decree-Law No. 1186 of April 3, 1939, as amended by Decree-Law No. 9735 of September 4, 1946. The original decree reducing the amounts of liability that may be retained by the companies was reinforced by Decree-Law No. 3172 of April 3, 1941, which required: (1) where an insurance is placed with two or more foreign companies, 50 per cent at least must be given to national companies; (2) where foreign companies already participate in the insurance, their share may be maintained or reduced, as the case may be, but under no circumstances can it be increased; (3) where insurance is placed exclusively with national companies, no foreign company is permitted to participate; and (4) where the sum

insured amounts to Cr. 1.5 million ($75,000) or more, it is mandatory that national companies participate to the extent of at least half. Under the schedule of fire excess retrocessions set up by the Reinsurance Institute, a large part of the undesirable risks are passed on to foreign companies.

Frontier zones for the purpose of national defense were established by Decree-Law No. 1968 of January 17, 1940, in accordance with Article 165 of the 1937 Constitution. The zone included other areas within 150 kilometers of the frontiers, within which land concessions could only be granted subject to the approval of the National Security Council (Conselho de Segurança Nacional). Those provisions were liberalized by Decree-Law No. 6430 of April 17, 1944, according to which foreigners are permitted a large measure of freedom in trade and land ownership, subject to certain restrictions. The 1946 Constitution provides for the predominance of national capital and workers in the frontier zones (Article 180).

Coastwise shipping and the fishing industry are reserved to Brazilians. However, a prohibition on foreign participation in industries "correlative" to fishing, which was contained in Decree-Law No. 794 of October 19, 1938, was eliminated by Decree-Law No. 1708 of October 27, 1939.

Captains of Brazilian merchant ships and pilots must be native Brazilians.

Special Taxes

All corporations (commercial and civil companies) are subject to income tax at the rate of 10, 12 or 15 per cent, depending upon the size of the income, as already indicated. In addition, individuals or firms domiciled abroad are subject to a further tax of 15 per cent, but with exemption for those profits of branches of foreign firms that are used to expand an industrial installation (*parque industrial*).

There is also the tax of 5 per cent on most exchange remittances, as mentioned in Chapter 10.

Methods of Doing Business

Many individuals and firms, especially in the manufacturing field, have made arrangements, or are interested in making arrangements, for participation by American firms either with capital or with know-how. Various types of arrangements have been made. Some are management contracts. In other agreements, the United States firm supplies equipment, formulas, patents or technical and managerial knowledge, receiving in return either stock participation, royalties or a percentage of the profits. In still others, the American firm may acquire control. And, of course, many American firms operate through fully-owned subsidiaries.

An American corporation may operate in Brazil either through "protocolization" (that is, by going through the necessary formalities to obtain permission for it to operate as a foreign company in Brazil) or by forming a Brazilian company. Brazilian law recognizes various kinds of commercial companies, of which the two principal types are the stock company or corporation (*sociedade anônima*) and the limited liability company (*sociedade de responsabilidade limitada por cotas*). The suitable form of organization will, of course, depend upon the particular circumstances in each case. The advantages and disadvantages of each type of company have been set forth in several recent publications.[7]

The corporation law now in force was enacted in 1940 and subsequently amended.[8]

Corporation shares may be common or preferred and either nominative or to bearer. All directors must be residents of Brazil.

7. For example, "Establishing a Business in Brazil," *International Reference Service,* Office of International Trade, Department of Commerce, Washington, D. C., December 1948, and *A Statement of the Laws of Brazil,* Inter-American Development Commission, Washington, D. C., 1948.

8. An English translation of the law will be found in *Corporations, Labor and Tax System in Brazil,* Brazilian Government Trade Bureau, New York, 1944.

Chapter 12

INTERNATIONAL TRADE AND EXCHANGE

AS A NET DEBTOR COUNTRY on international accounts, Brazil normally has an export surplus in its foreign trade. For the years since 1901, an import surplus appeared only in 1913, 1920, 1937, 1938, 1940 and 1947. These surpluses resulted from new foreign loans or investments, default on the foreign debt service or accumulation of credits abroad from exceptionally heavy exportation in years preceding the deficit.

Brazil had very large export surpluses from 1941 through 1945. There was also a large surplus in 1946, but in December of that year, as supplies and shipping became available, an import surplus developed. The year 1947 ended with an import surplus of $70-80 million, owing to abnormal imports during the early months of the year, although the tide turned again in August. (See Table 17.) [1]

Regional Distribution of Brazilian Trade

The United States has been Brazil's chief export market for three quarters of a century. Before World War I, Brazil's shipments to the United States were several times as large, by value, as purchases from that source. During the war the United States became the largest of Brazil's foreign suppliers. It has retained that pre-eminence except in a few years and the gap between imports and exports has narrowed. In 1944 the United States furnished over 61 per cent of the total value of Brazilian imports. This proportion declined to 55 per cent in 1945, but rose again to 58 per cent in 1946 and 61.3 per cent in 1947.

1. The author is indebted to Mrs. Irene Johnson for her assistance in compiling Tables 17, 19 and 20.

TABLE 17

VALUE OF IMPORTS AND EXPORTS: TOTAL TRADE AND TRADE WITH UNITED STATES, 1901-1947

(*In Millions of Dollars*)

Yearly Average or Year	Total Trade		Trade With United States	
	Imports	Exports	Imports	Exports
1901-1905	123	195	14	83
1906-1910	189	270	24	100
1911-1915	238	293	42	111
1916-1920	295	366	127	152
1921-1925	277	355	69	148
1926-1930	378	407	106	192
1931-1935	170	240	41	102
1936	247	320	55	124
1937	331	348	76	126
1938	295	296	72	101
1939	261	305	87	110
1940	251	265	130	112
1941	280	360	169	205
1942	236	403	127	184
1943	314	470	168	238
1944	409	579	250	307
1945	442	661	244	326
1946	671	981	391	414
1947	1,217	1,146	746	436

Source: Original data compiled from official reports of Ministério da Fazenda; conversions made by author in accordance with exchange ratio used by U. S. Department of Commerce, Office of International Trade.

Note: Export and import figures in this table cover merchandise trade and gold and silver bullion, but not specie. In practice, gold and silver movements through the customs are minor.

Prewar Europe supplied more than half of Brazil's imports and received a large share of Brazil's exports. The United Kingdom and Germany were the principal European traders with Brazil. The marked increase in Brazil's purchases of United States goods during World War II left Europe with only a 22 per cent share in Brazil's imports in 1946. Brazil still sold a large proportion of its goods to Europe, but the loss of the German market and the development of markets in other parts of the world resulted in a drop in Europe's share of Brazilian exports from 52 to 36 per cent between 1938 and 1946. (See Table 18.)

TABLE 18

PERCENTAGE DISTRIBUTION OF BRAZIL'S IMPORTS AND EXPORTS, BY PRINCIPAL COUNTRIES AND REGIONS, 1928, 1938 AND 1946

Continent and Principal Countries	Imports			Exports		
	1928	1938	1946	1928	1938	1946
Total	100.0	100.0	100.0	100.0	100.0	100.0
Europe	56.6	54.3	22.3	43.1	52.3	35.8
United Kingdom	21.5	10.4	7.9	3.4	8.8	8.8
Germany	12.5	25.0	—	11.2	19.1	—
Belgium-Luxemburg	3.9	4.0	1.3	2.7	3.6	4.3
France	6.4	3.2	1.0	9.2	6.4	2.1
Sweden	0.8	2.5	2.9	2.3	2.2	2.9
Italy	3.7	1.8	1.0	5.0	2.1	4.8
North America	28.7	29.3	65.5	45.8	34.8	44.1
United States	26.6	24.2	58.2	45.5	34.3	42.2
Canada	0.3	1.3	2.6	0.2	0.3	0.9
South America	13.7	13.8	10.7	9.1	6.3	12.3
Argentina	11.5	11.8	7.8	5.9	4.5	7.5
Chile	0.1	0.3	1.7	0.5	0.2	1.1
Asia	1.0	2.6	0.7	[a]	5.3	4.7
Japan	0.2	1.3	—	[a]	4.6	—
India	0.5	1.0	0.5	[a]	[a]	0.3
Oceania	[a]	[a]	[a]	[a]	[a]	0.3
Africa	[a]	[a]	0.8	2.0	1.3	2.8

Source: Compiled from official reports of Ministério da Fazenda.

a. Negligible.

South America has never rivaled Europe or North America either as a market for Brazilian goods or as a source of Brazil's import needs. Most of the South American trade is with neighboring Argentina. Purchases of Venezuelan petroleum and Chilean nitrate are also substantial.

A small percentage of Brazil's exports go to Asia, Oceania and Africa. Industrialized regions of the world have far outranked these underdeveloped regions in the scale of Brazilian imports.

Composition of Exports and Imports

The composition of Brazil's exports has changed much less over the last half century than the character of its imports. By far the larger part of exports consists of crude, or simply prepared, foodstuffs and raw materials, but exports of some manufactures have become important. From 1942 through 1945 cotton piece goods followed coffee as the second largest export item. In 1947 the total value of exports of manufactured products was about $88 million, not including manufactured foodstuffs like canned meats and tapioca or semimanufactures like pig iron. The principal items other than cotton cloth were rubber manufactures, pharmaceuticals, machinery, iron pipe, plywood and copper articles. (See Table 19.) Exports of finished manufactures may be expected to decline as international competition revives. Pig iron may become more important.

The largest group of imports consists of machinery, motor vehicles and parts, railway cars and locomotives, and vessels. This group comprised 33.5 per cent of the total value of imports in 1946. The next largest groups were basic iron and steel products (10.2 per cent), fuels and lubricants (9.1 per cent), wheat and wheat flour (7.2 per cent), industrial chemicals (4.1 per cent) and nonferrous metals (2.9 per cent). The foodstuffs and beverage group as a whole accounted for 19.1 per cent. Purchases of cement, jute, wool and wool yarn, newsprint, and pulp for paper manufacture were substantial. (See Table 20.)

Imports of consumption goods (other than foodstuffs and motor vehicles) probably did not amount to more than 5.4 per cent of the total. In other words, the bulk of the imports at present consists of capital goods, basic raw materials and food products. By way of contrast, cotton goods comprised 27.5 per cent of all imports in 1874-1875 and 14.8 per cent in 1904; machinery, 1.7 per cent in 1874-1875 and 5.4 per cent in 1904; and alcoholic beverages, 11.1 per cent in 1874-1875 and 7.4 per cent in 1904.

TABLE 19

VALUE OF EXPORTS, BY GROUPS AND PRINCIPAL ITEMS, 1946 AND 1947

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Total	18,230	21,179	980,774	1,145,784
Live animals	18	3	968	162
Prime materials	7,583	8,259	407,965	446,812
Animal				
Beeswax	9	6	484	325
Animal glue	12	15	646	812
Horsehair	17	11	915	595
Hides and skins				
Raw				
Cattle hides, salted	134	525	7,209	28,403
Cattle hides, dry	39	141	2,098	7,628
Goatskins, dry	58	97	3,120	5,248
Wild boar skins	35	24	1,883	1,298
Sheepskins, dry	45	45	2,421	2,435
Snake, alligator, lizard and similar skins	49	10	2,636	541
Jaguar and similar skins	18	12	968	649
Other	28	21	1,506	1,136
Tanned				
Pigskins	89	21	4,788	1,136
Cowhide or sole leather	65	41	3,497	2,218
Goatskins	15	27	807	1,461
Snake, alligator, lizard and similar skins	43	15	2,313	812
Other	33	24	1,775	1,298
Tallow	39	38	2,098	2,056
Other	16	33	861	1,785
Vegetable				
Manioc starch	31	18	1,668	974
Rosewood essence	59	27	3,174	1,461
Citrus fruit essences	12	4	646	216
Rubber, including latex, chicle and guttapercha	268	204	14,418	11,036
Tobacco, twist and leaf	493	377	26,523	20,396
Fibers				
Caroá	20	14	1,076	757
Sisal and istle	19	96	1,022	5,194
Piassava	32	23	1,722	1,244
Wax				
Carnauba	492	384	26,470	20,774
Ouricuri	77	53	4,143	2,867

TABLE 19—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Prime materials				
Vegetable (*Continued*)				
Oilseeds				
Babassú nuts	29	33	1,560	1,785
Brazil nuts, unshelled	94	84	5,057	4,544
Castor beans	196	619	10,545	33,488
Tucum nuts	16	35	861	1,894
Other	17	10	915	541
Oils				
Cottonseed	36	83	1,937	4,490
Castor	48	65	2,582	3,517
Oiticica	122	54	6,564	2,921
Other	31	13	1,668	703
Cocoa butter	94	96	5,057	5,194
Wood and plywood				
Cedar	38	25	2,044	1,353
Imbuia	25	16	1,345	866
Pine	706	841	37,983	45,498
Other	35	97	1,883	5,248
Other	93	92	5,003	4,977
Mineral				
Pig iron	24	42	1,291	2,272
Mica	27	33	1,453	1,785
Ore				
Iron	6	14	323	757
Manganese	37	32	1,991	1,731
Tungsten	23	30	1,237	1,623
Other	10	17	538	920
Precious and semiprecious stones				
Aquamarines	11	1	592	54
Diamonds	125	52	6,725	2,813
Other	37	8	1,991	433
Quartz	42	37	2,260	2,002
Other	7	7	377	379
Textile				
Cotton				
Raw	2,938	3,076	158,064	166,412
Linters	104	164	5,595	8,872
Waste	61	67	3,282	3,625
Thread and yarn	31	24	1,668	1,298
Wool				
Raw	28	69	1,506	3,733
Yarn	6	2	323	108
Silk thread and yarn	104	4	5,595	216
Other	36	16	1,937	866

TABLE 19—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Prime materials (*Continued*)				
Synthetic and other prime materials				
Menthol	80	89	4,304	4,815
Soap, sapolios and similar products	16	4	861	216
Other	3	2	161	108
Foodstuffs	9,284	11,287	499,479	610,627
Animal products				
Canned meat				
Beef	277	163	14,903	8,818
Other	66	36	3,551	1,948
Frozen meat				
Beef	40	130	2,152	7,033
Other	6	3	323	162
Tongue, canned	7	4	377	216
Beef fat	35	[b]	1,883	—
Meat extract	46	29	2,475	1,569
Other meats and meat products	19	16	1,022	866
Other	17	4	915	216
Vegetable products				
Sugar	72	221	3,874	11,956
Rice	385	683	20,713	36,950
Cocoa beans	651	1,048	35,024	56,697
Cocoa paste	16	36	861	1,948
Coffee beans	6,441	7,755	346,526	419,546
Manioc flour	203	171	10,921	9,251
Manioc starch	75	17	4,035	920
Flours and meals, other than manioc flour and starch	8	12	430	649
Tapioca	33	29	1,775	1,569
Rice meal, coarse	18	57	968	3,084
Beans	142	73	7,640	3,949
Corn	153	245	8,231	13,255
Mate	133	160	7,155	8,656
Fruits and nuts				
Bananas	54	83	2,905	4,490
Oranges	147	101	7,909	5,464
Brazil nuts, shelled	93	60	5,003	3,246
Other	17	14	915	757
Other vegetable products, including beverages	48	73	2,582	3,949

TABLE 19—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Foodstuffs (*Continued*)				
Other foodstuffs	2	[b]	108	—
Fodders and feeds				
Oilcake				
Cottonseed	69	32	3,712	1,731
Other	1	25	54	1,353
Bran for feed	10	6	538	325
Other	[b]	1	—	54
Manufactures	1,345	1,630	72,361	88,183
Rubber				
Articles for personal use	18	8	968	433
Rubberized fabrics	22	2	1,184	108
Tires and tubes	53	15	2,851	812
Other	36	18	1,937	974
Copper clasps for purses, luggage and the like	21	7	1,130	379
Iron and steel				
Pipe	12	9	646	487
Other	13	5	699	271
Earthenware and glass articles	18	12	968	649
Wood articles	16	32	861	1,731
Textile				
Cotton				
Hosiery	13	3	699	162
Fabric	703	1,253	37,821	67,787
Other	41	30	2,206	1,623
Wool fabric	28	14	1,506	757
Rayon				
Hosiery	13	3	699	162
Fabric	15	1	807	54
Other	1	[b]	54	—
Silk				
Hosiery	76	9	4,089	487
Fabric	12	2	646	108
Other	1	[b]	54	—
Other	8	5	430	271
Pharmaceutical products				
Caffeine and salts	42	21	2,260	1,136
Alkaloids, other than caffeine and salts	34	19	1,829	1,028
Medicinal injections	20	16	1,076	866
Other	18	20	968	1,082

TABLE 19—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Manufactures (*Continued*)				
Chemicals, organic, inorganic, mineral salts and fertilizers	3	11	161	595
Pencils	11	16	592	866
Machines, apparatus, tools and equipment, including scientific and professional apparatus, cutlery, tools and other utensils, electrical machines, industrial and household machines and miscellaneous apparatus	38	65	2,044	3,517
Other	59	34	3,174	1,839

Source: *Comércio Exterior do Brasil,* Ministério da Fazenda, Serviço de Estatística Econômica e Financeira, Rio de Janeiro, January-December, 1946 and 1947. Specie not included.

a. Converted at the rate of $.0538 to the cruzeiro for the year 1946 and $.0541 for 1947.

b. Less than 500,000 cruzeiros.

TABLE 20

VALUE OF IMPORTS, BY GROUPS AND PRINCIPAL ITEMS, 1946 AND 1947

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Total	13,029	22,789	670,994	1,216,933
Live animals	55	45	2,833	2,403
Prime materials	3,424	4,961	176,336	264,917
Animal				
Hides and skins, raw and tanned	64	42	3,296	2,243
Rabbit hair	46	29	2,369	1,549
Hair, other than rabbit	3	4	154	214
Tallow	—	—	—	—
Other	32	25	1,648	1,335
Vegetable				
Leaf tobacco	16	18	824	961
Hops	27	33	1,390	1,762
Turpentine	5	—	258	—
Black pine resin	38	95	1,957	5,073
Quebracho extract	15	7	773	374
Essences for beverages and candy	14	11	721	587
Fertilizers	10	—	515	—
Cellulose acetate	6	13	309	694
Cellulose for paper manufacture	201	372	10,352	19,865
Other	91	115	4,687	6,141
Mineral				
Turpentine substitute	8	8	412	427
Pigments				
Lampblack	10	24	515	1,282
Other	10	12	515	641
Asphalt	5	16	258	854
Cement, common and white	202	240	10,403	12,816
Sulphur	22	34	1,133	1,816
Coal and coke	364	627	18,746	33,482
Aluminum bars, ingots, plates or sheets, aluminum silicate for steel manufacture, and miscellaneous forms	30	54	1,545	2,884
Lead bars, ingots, rods, sheets or plates and other forms	97	76	4,996	4,058

TABLE 20—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Prime materials				
Mineral (*Continued*)				
Copper, ingots, rolled or hammered and other forms	184	174	9,476	9,292
Tin bars, ingots, plates, etc.	26	31	1,339	1,655
Zinc bars, ingots, pigs, etc.	19	18	979	961
Iron and steel semimanufactures				
Bars and rods	111	153	5,717	8,170
Angles, tees and similar forms	36	39	1,854	2,083
Sheets or plates	179	237	9,219	12,656
Strip	64	97	3,296	5,180
Other, including pig iron and ferroalloys	23	22	1,185	1,175
Petroleum and products				
Crude petroleum	18	4	927	214
Gasoline	355	668	18,283	35,671
Fuel and Diesel oil	268	455	13,802	24,297
Gas oil	6	3	309	160
Lubricating oils	119	241	6,129	12,869
Kerosene	51	99	2,627	5,287
Stones and earths, including industrial salt	48	60	2,472	3,204
Precious stones	36	15	1,854	801
Silver	24	6	1,236	320
Other	59	73	3,039	3,898
Textile				
Cotton thread and yarn	43	55	2,215	2,937
Jute, unmanufactured	58	57	2,987	3,044
Wool and wool yarn	70	159	3,605	8,491
Other	65	105	3,348	5,607
Synthetic and other prime materials				
Aniline dyes	69	89	3,554	4,753
Perfume essences	42	37	2,163	1,976
Plastic materials or synthetic resins	15	41	773	2,189
Paints for water coloring or painting and prepared water and oil paints	7	13	361	694
Writing and printing ink and paints prepared with varnish, pyroxylin and bitumen	27	41	1,391	2,189
Other	86	114	4,429	6,088

TABLE 20—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Foodstuffs	2,494	4,072	128,441	217,445
Dairy products	43	60	2,215	3,204
Wheat	406	1,058	20,909	56,497
Wheat flour	535	1,432	27,553	76,469
Barley malt	73	144	3,760	7,690
Oatmeal	8	28	412	1,495
Beverages	242	298	12,463	15,913
Codfish	80	166	4,120	8,864
Garlic	36	17	1,854	908
Onions	21	7	1,082	374
Peppers	58	19	2,987	1,015
Fresh fruits				
Apples, pears and grapes	216	276	11,124	14,738
Other, including nuts	45	92	2,318	4,913
Olives	54	48	2,781	2,563
Olive oil	151	79	7,777	4,219
Other	526	348	27,089	18,583
Manufactures	7,056	13,711	363,384	732,167
Leather shoes, machine parts and other manufactures (including fur wearing apparel)	19	15	979	801
Brushes, machine belting and hats of hair, feather manufactures and miscellaneous articles of animal by-products	6	5	309	267
Rubber				
Thread, sundries, shoes, sporting goods, tubing and other articles, including rubberized fabrics	19	40	979	2,136
Tires and tubes	8	111	412	5,927
Wood articles	20	34	1,030	1,816
Paper				
Newsprint	146	188	7,519	10,039
Other	110	196	5,665	10,466
Articles	77	94	3,966	5,020
Cork stoppers	18	21	927	1,121
Cork, other than stoppers; cigars, cigarettes and other tobacco manufactures; straw and rattan articles	7	8	361	427

TABLE 20—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Manufactures (*Continued*)				
Window glass	15	42	773	2,243
Earthenware and glass manufactures, other than window glass	77	168	3,966	8,971
Fabric and articles of asbestos	19	36	979	1,922
Miscellaneous asbestos manufactures, other than fabric and articles, and clay and stone manufactures	52	72	2,678	3,845
Copper wire, tubing, machine accessories and other articles	51	82	2,627	4,379
Iron and steel				
Machine accessories	71	90	3,657	4,806
Barbed wire	36	94	1,854	5,020
Bare wire, plain or galvanized	95	164	4,893	8,758
Articles for further manufactures and installations	40	78	2,060	4,165
Cable	29	21	1,494	1,121
Tinplate sheets	117	272	6,026	14,525
Construction material	39	99	2,009	5,287
Rails, rackrails and accessories	216	157	11,124	8,384
Pipe	146	201	7,519	10,733
Other	123	230	6,335	12,282
Gold, platinum, silver, lead, tin, zinc, aluminum, molybdenum and tungsten manufactures	42	62	2,163	3,311
Textiles				
Cotton				
Fabric	32	82	1,648	4,379
Other	22	54	1,133	2,884
Wool				
Fabric	19	68	979	3,631
Other	27	32	1,391	1,709
Linen				
Fabric	64	216	3,296	11,534
Other	18	38	927	2,029
Other, including hemp and jute, silk, rayon and nylon	35	60	1,803	3,204

TABLE 20—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Manufactures (*Continued*)				
Plastic materials				
Articles for personal use, excluding celluloid manufactures	46	21	2,369	1,121
Other	54	62	2,781	3,311
Pharmaceutical products				
Medicinal injections	36	46	1,854	2,456
Penicillin	19	30	979	1,602
Other	145	170	7,468	9,078
Inorganic chemical products				
Soda ash	24	47	1,236	2,510
Mineral salts, other than soda ash	74	97	3,811	5,180
Caustic soda	45	191	2,318	10,199
Other	59	102	3,039	5,447
Organic chemical products	67	78	3,451	4,165
Chemical fertilizers				
Sodium nitrate	42	103	2,163	5,500
Other	28	78	1,442	4,165
Other chemical products	29	56	1,494	2,990
Perfumery	26	22	1,339	1,175
Machines, apparatus, tools and equipment				
Apparatus, instruments, machines and articles for physical, chemical, mathematical and optical use	167	274	8,601	14,632
Air compressors	37	49	1,906	2,617
Cutlery, hand tools and sundry equipment	173	371	8,910	19,811
Freezers, refrigerators and similar apparatus	46	211	2,369	11,267
Agricultural implements and equipment	47	90	2,421	4,806
Railway locomotives	228	239	11,742	12,763
Railway locomotive accessories	26	21	1,339	1,121
Industrial and office machines, apparatus, equipment				
Metallurgical	51	52	2,627	2,777
Machine tools, including lathes	84	100	4,326	5,340

TABLE 20—CONTINUED

Group or Item	1946	1947	1946	1947
	(*Millions of Cruzeiros*)		(*Thousands of Dollars*)[a]	
Manufactures				
Industrial and office machines, apparatus, equipment (*Continued*)				
Machines operated by gas, gas substitute, alcohol, gasoline, hot air or other explosive mixture	87	214	4,480	11,428
Road maintenance machinery, including excavators	77	143	3,966	7,636
Tractors, excluding agricultural, mechanical rollers and compressors, steam, oil, alcohol, turpentine or electrically operated	44	84	2,266	4,486
Calculating machines, Hollerith and other types	52	83	2,678	4,432
Typewriters	48	122	2,472	6,515
Sewing machines	64	112	3,296	5,981
Other	810	1,704	41,715	90,994
Electrical machines and apparatus				
Radios, radiophonographs and accessories for household use	194	430	9,991	22,962
Telephonic and telegraphic receivers	72	90	3,708	4,806
Generators and engines	126	243	6,489	12,976
Parts for electrical equipment	51	111	2,627	5,927
Other	291	568	14,987	30,331
Vehicles and accessories				
Automobiles, trucks, buses, railcars, truck and bus chassis	717	2,160	36,926	115,344
Automobile accessories	240	573	12,360	30,598
Boats and accessories	41	454	2,112	24,244
Railway cars and accessories	276	249	14,214	13,297
Other	161	329	8,292	17,569
Other	337	402	17,356	21,467

Source: Comércio Exterior do Brasil, Ministério da Fazenda, Serviço de Estatística Econômica e Financeira, Rio de Janeiro, January-December, 1946 and 1947. Specie not included.

a. Converted at the rate of $.0515 to the cruzeiro for the year 1946 and $.0534 for 1947.

Customs Tariff and Controls

Most imports into Brazil are dutiable. The principal exceptions are importations by the Brazilian government (except in cases where similar articles are produced in sufficient quantities in Brazil) and certain types of machinery. Some industries are required to pay only specified percentages of the rates, or are exempted entirely (for example, Volta Redonda).

The general level of rates is low, being calculated at about 10 per cent. However, some individual rates are high enough to be virtually prohibitive. The customs tariff, long the principal source of federal revenues, is still primarily a revenue measure, although the development of other taxes has made the government less dependent on that source of income.

The effective charges on imports are higher than the published rates indicate. Fines, often on trivial grounds, are frequent, since customs inspectors are granted 50 per cent of the fine. Owing to the low level of official salaries, and other reasons, it has not been possible to eliminate this obnoxious situation. Furthermore, the consumption tax rates, which apply to most articles, are higher on imported than on domestic goods. In August 1947 the Chamber of Deputies requested the Ministry of Finance to draw up a new consumption tax law, in order to adjust it to the new Constitution and to comply with international agreements providing for equal treatment of domestic and imported goods, but action has not been completed.

Most tariff rates are specific (that is, fixed in terms of unit or weight rather than as a percentage of the value). Hence the ad valorem equivalents have declined as prices have risen. In 1946, the Treasury proposed a general increase of most rates to compensate for price changes since 1934, when the present tariff was enacted. Agreement permitting a 40 per cent increase was reached at the Geneva International Trade Conference in 1947. The new schedule of rates was put into effect on August 1, 1948, but on some

imported articles rates were increased only 10 per cent and on others only 20 per cent.

Trade relations between the United States and Brazil were governed by the trade agreement signed April 17, 1935 and effective from January 1, 1936 until this was replaced by the General Agreement on Tariffs and Trade, provisionally effective from August 1, 1948. In practice, import licensing and exchange controls are more effective instruments of commercial policy than the customs tariff.

The commercial policy now being followed by the Brazilian authorities may be summarized as follows:

1. Import controls are to be used to protect those domestic industries considered economically justified.
2. Import controls are to be used to reduce imports of less essential goods in order to conserve exchange for essential imports and other high-priority uses.
3. Import licensing of nonessential goods is to be used to obtain compensation from other countries.

International Balance of Payments

Aside from the fluctuations in the trade balances, the principal change in the balance of payments position of Brazil has been the reduction in transfers on account of both the funded foreign debt and private investments. In 1929, service on the external debt amounted to $97 million; under the 1943 readjustment it has been stabilized at $32 million. Private interest and dividend remittances have also declined as the consequence of net disinvestment, from about $73 million to around $40-50 million at present, although transfers were higher in 1946 and 1947 during the period of easy exchange owing to the accumulation of a backlog during the years of more stringent controls.

The reduction in the funded external debt has been partly offset by new loans from agencies of the United States government. As of June 30, 1947 the utilized portions of the

loans and credits extended after July 1, 1945 were as follows (in millions):

Export-Import Bank	$40.5
Foreign Liquidation Commission	8.0
Maritime Commission and RFC	8.2
	$56.7

In addition, the unutilized portion of the loans and credits available at the middle of 1947 amounted to $50.7 million, bringing the total credits available to $107.4 million. Allowing for repayments, Brazil's net indebtedness to United States agencies amounted to $104 million.

Since these figures were published, an announcement was made in April 1948 that a final lend-lease settlement had been made with Brazil whereby Brazil undertook to pay a balance of $35 million to the United States. It was also announced that Brazil had utilized $80 million of the United States Treasury stabilization fund.

Other than debt service, the principal current nontrade item is immigrant remittances, principally to Portugal, amounting to about $30-50 million, depending on the availability of exchange. Expenditures by Brazilian tourists and residents abroad amount to $3 million. Expenditures by the Brazilian government abroad on its consular and diplomatic service may be considered as offset by similar expenditures in Brazil by foreign missions.

Brazil receives credits on current account from shipping services (about $18 million) and expenditures of foreign tourists in Brazil ($5 million). Since Brazil's imports are shown on a c.i.f. basis, payments for foreign-flag shipping are included in the trade items.

On balance, Brazil needs an export surplus of $75-100 million to take care of the current "invisibles," including repayment of existing loans. New private investments or credits would temporarily stimulate imports without the need of a corresponding rise in exports, but over the longer

TABLE 21

INTERNATIONAL BALANCE OF PAYMENTS OF BRAZIL, 1947

(*In Thousands of Cruzeiros*)

Item	Active	Passive	Balance
Movement of merchandise			
Exports and imports	18,550,737	19,293,919	
Freight, insurance, commissions	196,907	318,207	
Adjustments	71,236	78,388	
	18,818,880	19,690,514	
Redemption of foreign-financed imports		8,026	
Exchange available for industrial equipment		170,282	
	18,818,880	19,868,822	—1,049,942
Services			
Transport, communications	641,685	186,749	
Insurance, reinsurance	22,167	26,505	
Banking services	174,633	128,621	
Tourism, travel, maintenance and assistance	252,555	1,229,016	
Authors' rights	2,138	76,937	
Capital income	5,216	427,100	
Public utility income		11,283	
Governmental income	121,970	870,053	
Various	106,667	170,205	
	1,327,031	3,126,469	—1,799,438

run a still larger surplus would be required to meet the interest, dividends and amortization on the total investment.[2]

Export and Import Prospects

The export outlook is summarized below.

Despite prevailing pessimism regarding the long-range outlook for coffee, exports of that commodity should continue on the level of recent years for some time to come.

Domestic consumption will absorb increasing proportions of production of food crops, vegetable oils, meat and some raw materials. In some cases production may be increased

2. Brazil's international balance of payments for 1947 is given in Table 21.

TABLE 21—CONTINUED

Item	Active	Passive	Balance
Movement of capital			
Foreign capital investments [a]	771,120	121,557	
Brazilian investments abroad [b]	78,967	315,961	
Cash exchanges (*câmbio manual*)	2,037	61	
	852,124	437,579	+ 414,545
Movement of gold			
Bought and sold abroad		754	— 754
Barter and symbolic entries			
Barter	2,124,581	2,179,133	
Symbolic entries (to regularize exchange)	123,090	125,472	
	2,247,671	2,304,605	— 56,934
Over-all totals	23,245,706	25,738,229	
Over-all deficit			—2,492,523

Source: Issued by the Statistics Department of the Bank of Brazil.

a. Amount in Active column represents entry of new capital; in Passive, departure of capital invested in Brazil.

b. Amount in Active column refers to return of Brazilian capital invested abroad; in Passive, to departure of Brazilian capital for investment abroad.

sufficiently to take care of internal needs and to provide larger export surpluses, but that is conjectural.

Improvement in the financial and exchange position of the United Kingdom and continental European countries would afford an outlet for substantial exports of fruits, tobacco, sugar, coffee, hides, cotton and miscellaneous items.

Internal consumption of wood is increasing, but over the longer run Brazil should be an important source of supply to foreign countries of lumber and lumber products.

Some growth in exports of manufactures and semimanufactures may be expected over the long run.

Minerals offer the best hope of any large increase in exports over present levels: iron ore, pig iron, manganese and various other metals and nonmetallic minerals, including petroleum.

The extent of "offshore" purchases in Brazil by the European Cooperation Administration had not been determined as this was written, but the prospects of any large procurement program appeared doubtful. At the same time, even partial success of the Marshall Plan might be expected to improve Europe's buying power and partially restore Brazil's traditional markets.[3]

As for imports, a substantial backlog of demand for industrial and railway equipment, motor vehicles, road-building and agricultural machinery and other capital goods still exists, and the enlarged cruzeiro purchasing power of a considerable portion of the population keeps up the pressure for consumer goods, despite import controls. Devaluation of the cruzeiro might reduce the demand somewhat, but possibly less than would be expected. Generally speaking, Brazilian officials concerned about exchange availabilities are apt to put more emphasis on reducing imports than on increasing exports—a negative attitude perhaps unduly influenced by the current international situation. Wheat and petroleum are two large import items that have been singled out for attention. Undoubtedly, further efforts will be made to increase wheat production, but the continuance of substantial imports of wheat and flour is likely.

Gold and Exchange

Brazil's gold and exchange holdings increased greatly during the war years, rising from $97.1 million at the end of 1939 to $674 million at the close of 1945, $755 million at the end of 1946 and $728 million at the end of 1947 (including a small amount held by private banks). In actual practice, however, the situation is less favorable than these figures suggest, since most of the gold held for the government is earmarked for currency reserve or as cover for

3. Subsequent information indicates that ECA financing of purchases in Brazil from April 3 to December 31, 1948 would amount to about $36 million, covering chiefly shipments of livestock feed (oil cake and meal), sugar and vegetable oils.

ROMANTIC RIO ALSO MEANS BUSINESS, as one can see from this unusual view of downtown Rio de Janeiro, looking along Avenida Rio Branco past wharves, factories, office buildings, toward curving beaches and fabled Sugar Loaf mountain beyond.

the exchange stabilization credit, while the larger part of the exchange reserve consists of nonconvertible European currencies.

The gold and exchange reserve on December 31, 1947 was made up of $354 million in gold and $420 million in exchange (plus $16 million due exchange banks from foreign correspondents). The only freely transferable currencies included in the reserve consisted of $28.1 million in dollars, $3.8 million in escudos and a negligible amount of Uruguayan pesos. The larger part was in the form of sterling, which the President in his message of March 15, 1948 reported as amounting to £ 54,943,646 (say $220 million).

In 1946 Brazil made a series of exchange and credit agreements with France, Belgium, Czechoslovakia and Finland. Proceeds from sales to France, in a total of $19.5 million, are being used to repatriate French-held Brazilian bonds. Holdings in other currencies announced by the President consisted of 1,223 million Belgian francs ($28 million) and 793 million Czech crowns ($15.8 million). Some exchange is also blocked in various other countries, such as Argentina, Chile, Portugal and Sweden.

Exchange Control

Since 1931, exchange control has passed through various periods of tightness and laxity. During 1946 a series of steps were taken relaxing the regulations in force since April 1939. The "official" and the so-called "special free" exchange rates were abolished, leaving only one market. The tax on exchange remittances was reduced and then eliminated entirely.

These measures, combined with a slight improvement in the external value of the cruzeiro, gave rise to fairly large remittances of accumulated profits and dividends, and also to more liberal transfers by immigrants to relatives and friends in Europe. At the same time, a heavy import movement began, particularly from the United States, requiring

payment in dollars. By mid-1947 an exchange shortage developed. The factors leading to this shortage may be summarized as follows:

Cash payments on external debt arrears during 1944 and 1945 and repatriation of Grade VIII bonds; also reported use of dollars to repatriate sterling bonds

Subscription of the International Bank quota and payment of $2.1 million in gold

Exchange blockage in Europe, and unwillingness of Brazil to accept more "soft" currencies in payment for exports

Heavy purchases in dollars, induced by greatly expanding purchasing power in Brazil, and aggravated by abnormally high prices of certain major import items, particularly wheat

Large immigrant remittances and transfers of profits, interest and dividends

Flight from the cruzeiro by Brazilians as result of rumors of possible devaluation of the currency

Tighter exchange control was reintroduced by Instruction No. 25 of the Superintendency of Money and Credit, of June 3, 1947, which provided for a system of priorities in exchange allocation. Banks authorized to deal in exchange were required to sell daily to the Bank of Brazil 30 per cent of their purchases of free exchange (this percentage was later increased to 75, then reduced to 50, and again raised to 75 on November 17, 1948). After the government's needs are met, coverage would be provided in accordance with the following priorities: (1) essential imports, (2) remittances of royalties, interest, profits and repatriation of capital, (3) travel and maintenance expenses abroad, (4) merchandise not included in the first category and (5) gifts, donations and remittances for other purposes.

Meanwhile, the system of import licenses, which was made effective on an extensive list of commodities early in 1945 but later suspended, was re-established in March 1947.

As the authority for this measure antedated the enactment of the 1946 Constitution, the administration sought and obtained from Congress new legislation, dated February 25, 1948, authorizing the imposition of import controls (except on cement, pharmaceutical products and essential foodstuffs) and also export controls. The supplementary regulations provide that import-licensing priority would be on the same basis as that established by the exchange authorities.

Exchanges and Foreign Investment

All foreign investors, except those who expect to reinvest all earnings in Brazil, are naturally interested in freedom of remitting funds abroad. The rate at which such remittances can be made is also important. Since 1931 there have been periods when remittances of capital and dividends have been subject to considerable delays, or when the remitters were forced to buy exchange at less favorable rates than the official exchange reserved for purposes having higher priority. In 1946 the Brazilian government undertook to give some assurances on these points to encourage foreign investment. Decree-Law No. 9025 provided for a special register of exchange operations not originating in merchandise movements. It further provided:

Article 6. The right of repatriation is assured to foreign capital previously registered in the exchange department of the Bank of Brazil, provided that the amount transferred per year does not exceed twenty per cent of the capital registered.

[Unnumbered Paragraph] After having remained in the country for two years, foreign capital invested in securities of the Brazilian internal debt, or others of fixed income, shall be guaranteed immediate and integral transfer.

Article 7: The provisions of this decree-law shall apply with observance of the periods and conditions herein established, to foreign capital already placed in the country, but from the date of registry thereof.

Article 8: The remittance of interest, profits, and dividends shall not exceed eight per cent of the value of the registered capital; any excess to this percentage shall be considered a transfer of capital and for this purpose the periods provided in this decree-law shall apply.

Subsequent regulations extended the time for registration of capital already in the country to March 31, 1948.

The test of a measure of this kind can come only in a period of serious exchange shortage. The attitude of investors will doubtless be determined more by the performance record than by the text of the decree-law.

Investors, especially investors in fixed-income securities, are also influenced by the prospects for the cruzeiro-dollar rate. While the Brazilian currency has never undergone the violent devaluations witnessed in Europe after the first and second world wars, it has shown a fairly steady trend toward depreciation over the last century, except during the last decade of the Empire. There has been comparative stability since 1934 of the effective buying and selling rates applicable to transactions by the general public. During this period the value of the Brazilian currency unit has been around 5 cents, United States currency, as compared with the parity of 11.96 cents established in 1926. Since 1931, however, there have usually been several exchange markets, and the prevailing rate in the "free," "special free," "grey" or "black" markets has varied considerably from the norm.

Brazil has been subject to recurrent periods of exchange difficulties. Until 1931 the situation was met by currency depreciation, new external loans or fundings. As the currency depreciated, exchange with which to meet debt service and other remittances was obtained by requiring part of the customs duties to be paid at the "gold rate," which also served to curb imports in times of unfavorable trade balances.

Proposals for Modification

Some machinery for exchange control has existed since World War I, but the degree of control has varied greatly depending on circumstances. In a country like Brazil the importance of the exchange situation is such that exchange regulation has become an essential part of monetary management and a major instrument of commercial policy. At the

same time the evils of a rationing type of control are clearly recognized, and much thought has been given to possible modifications designed to eliminate its more objectionable features.

Dr. Eugenio Gudin, a prominent economist, in an article published in a leading Rio newspaper (*Correio da Manhã,* March 21, 1948), criticized the prior licensing procedure on the grounds of the difficulty of achieving equitable distribution and the corruption to which it gives rise. However, he advised against devaluation for three reasons: (1) in view of the high prices being obtained for exports, devaluation would aggravate inflation; (2) devaluation would increase the cruzeiro cost of such essentials as wheat, coal, machinery and petroleum products; and (3) because the elasticity of Brazil's exports and imports is low, devaluation would not have much effect on either. An an alternative, he suggested a system of multiple rates, one for leading export products and essential imports, another for capital movements and a third for nonessential imports. A fourth rate might be established by auction. A multiple-rate system did exist from 1939 to 1946, but without auctions. The plan has some advantages but it involves invidious discrimination and also further bureaucratic red tape.

Chapter 13

THE ECONOMIC FUTURE

BRAZIL IS BOTH an old and, in many respects, an underdeveloped country. Parts of the nation were prosperous and enjoyed a high level of civilization while the United States still consisted mainly of virgin land on which early settlers struggled to keep themselves alive. Yet each period of Brazilian prosperity was based primarily on the extraction and shipment abroad of one of a series of natural products. Exhaustion of resources or of soil fertility, or collapse of the market for a particular product, periodically caused a decline and a shift to a new source of wealth. The United States might have had a similar history if the early exportation of furs and forest products from the North and of rice and indigo from the slave plantations of the South had not been followed by the development of a vigorous and highly productive economy depending mainly on the domestic market for agricultural and manufactured goods.

The United States still exports large quantities of tobacco, cotton and other natural products once relied upon by the colonists for income from abroad, but it cannot be so severely affected by a shrinkage of the foreign market for such crops or by a decline in ability to produce them economically as Brazil now is injured by any trouble in the marketing or growing of her chief export staple—coffee.

The difference is only relative, and is subject to many qualifications. The bulk of Brazil's agricultural production is consumed by her own population. There is no surplus of food products in the sense that more food is produced than is required for an adequate diet. Indeed, the contrary is true. And while 70 to 75 per cent of Brazil's population is

rural, as against approximately 43 per cent in the United States, there has developed a thriving group of manufacturing industries, producing both for domestic consumption and for export. The value of the output of these manufactures is as great as that of agriculture.

Brazil's factories have, however, scarcely begun to tap her extensive natural resources, and there are still, in the vast stretches of the nation, many "frontier" regions. Prominent among the underdeveloped resources are what are perhaps the largest deposits of high-grade iron ore and manganese in the world and much potential hydroelectric power. There are high hopes for petroleum development. Many other minerals exist in relative abundance.

The obstacles which have hitherto retarded the growth of a highly productive economy are numerous, but not insuperable. There is a lack of coal of good quality, in seams thick enough for economical mining. Distances are great, and resources which need to be combined for productive purposes are often widely separated from one another. The tropical climate of much of the country saps human energy, while at the same time it favors the prevalence of pests and diseases which are injurious to people, domestic animals and cultivated plant life. Soil from which the forests are removed is quickly leached of its fertility or washed away in the regions of heavy rainfall. Large groups of the population suffer from undernutrition and disease; life expectancy is short, and a relatively high proportion of youths never attain the years of greatest productivity. Income is distributed very unequally and the average per capita income is low.

Economic Nationalism and Governmental Intervention

After many decades of the "open door" to immigration and foreign enterprise, as well as comparative laissez faire in the domestic economy, Brazil in the 1930's, like many other nations, made a sharp turn toward economic nationalism and governmental control of economic affairs. The

world-wide depression deprived the nation of the means with which to buy customarily imported goods both for consumption and for capital equipment. Markets for exports declined and the sources of inflowing capital dried up. Unemployment and deflation gave rise to political unrest, and radical movements made headway. The reaction against these tendencies produced an authoritarian government ruling by decrees and striving for greater national self-sufficiency. Immigration was severely restricted; regulations of foreign exchange, imports and exports were introduced. Government began to play a more active role in internal development.

The changes which came at the end of the recent war modified the Vargas Constitution and reintroduced a more liberal type of government and outlook; yet the heritage of the war itself made necessary the continuance of governmental controls, and the desire for greater national self-sufficiency and internal development persisted. This tendency was reinforced by the fact that during the war, and for some months after it, the world-wide shortages of goods and the necessary regulations of production and trade by other nations deprived Brazil of the opportunity to import all the goods its people needed or desired, even though for a time foreign exchange, earned through sales of war materials to the chief allied belligerents, was plentiful. The piling up of purchasing power, combined with the expansion of war production, much of it financed by the United States, led to severe inflation which aggravated the existing shortages of domestically produced consumer goods.

It is hardly surprising that the postwar plans have placed strong emphasis on the provision of goods for the internal market, industrialization, expansion of power facilities, and have de-emphasized the promotion of exports. In some respects this shift of emphasis is healthy, but in practice a well-balanced program of economic development, and any important increase of national productivity, is bound up

with a concomitant growth of international trade. Although the proportion of foreign trade to the national income may be expected to decrease as that income grows, and the composition of export and import trade changes, the absolute quantity of foreign trade will doubtless increase as productivity and per capita purchasing power rise. Brazil, though well endowed with national wealth, does not have the resources to become completely self-contained; the richer and more varied her own production, the more opportunity for foreign trade.

The re-equipment and the building of railways and roads, the attempt to introduce scientific agriculture, the contemplated increase of manufacture, the programs for sanitation and the development of hydroelectric power, all involve purchase of materials and equipment from abroad, the participation of foreign capital, the need for foreign skills and administrative assistance.

Brazil would greatly facilitate the foreign aid which is required if the government should liberalize the existing restrictions on immigration, the employment of foreign technicians, the movement of capital, the fields open to foreign investment, the discriminatory taxation, the trade and exchange controls. A business and industrial climate more attractive to foreign investment might be created without sacrificing any legitimate Brazilian interest. Though it was natural to limit the competition from foreign labor and enterprise at a time when unemployment was prevalent, such a program is not consistent with the projected period of expansion and development, which is bound to be hampered by shortages of domestic labor, materials, equipment and supervisory skills. Proper provision may be made for assuring that the Brazilian people will be the primary beneficiaries of foreign aid without discouraging that aid itself. All would benefit by a more liberal policy.[1]

1. See Appendix 3 for a summary of the economic development needs of Brazil as reported by the Joint Brazil–United States Technical Commission.

Plans and Planning Agencies

Since 1930 Brazilians have come to think more in national terms, as the power and influence of the federal government has gained over the separatist tendencies of the states. Increasing public awareness of the urgent problems facing the country has also led to stocktaking of the country's needs, resources and liabilities. The need for coordinated action under federal direction has received fairly general acceptance, but there are unresolved differences as to the roles of the state and private enterprise, of national and outside capital and initiative. Some officials have perhaps been too easily fascinated by vast plans that have at times hampered efforts at realistic planning and action. Nevertheless, some of the planning and coordinating agencies set up during the last two decades have done useful work and have helped to train a new generation for the tasks ahead.

Federal Agencies

The oldest of the existing planning organizations is the so-called National Foreign Trade Council (Conselho Federal de Comércio Exterior), established in 1934 under the chairmanship of the President of Brazil. It is composed of sixteen members, of whom three are named by the National Confederations of Commerce, Industry and Agriculture. In fact, its functions are much broader than its name would indicate. It has made studies of a wide range of economic problems: commercial treaties; promotion of national industries, such as steel, alkalies and alcohol; the merchant marine; the meat industry and trade; regulatory bodies or institutes for mate, salt and pine wood; mobilization of raw materials during the war; and similar matters. It is not merely a planning board; its decisions, such as on tariff matters, are given the force of law. Its executive director, until recently, was a career foreign service officer, who was replaced by General Anápio Gomes.

The Technical Council of Economy and Finances (Con-

selho Técnico de Economia e Finanças) was organized in 1937, under the chairmanship of the Minister of Finance, replacing a commission established in 1931 to study the debts and finances of the states and municipalities. The council had an important part in preparing the plan for foreign debt settlements and has done much to standardize and improve budgeting procedures.

The Fundação Getúlio Vargas is a research organization which has brought together some of the best economic talent in Brazil. It has undertaken valuable long-range economic studies. One of the first monographs published under its auspices, on the "Planned Development of the Brazilian Economy," [2] is an excellent preliminary to more detailed researches. It emphasizes the error of the too rapid opening up of new areas, especially those remote from commercial centers. Frequently the new lands are planted to crops poorly adapted to the soil and climate, only rudimentary processes of clearing and cultivating are used, transport costs are high, and the yield does not afford sufficient returns to provide adequate sanitation, schools or other civilizing amenities. In consequence a caboclo standard of living prevails. The study emphasizes the need for more rational planning of new colonization projects and better utilization of lands near population centers before opening up new areas. To this end the author suggests higher taxes on undeveloped lands, or expropriation if necessary. He makes the important point that railway plans, present and past, are influenced too much by the political-military-administrative viewpoints, instead of being coordinated with economic possibilities.

The 1946 Constitution provides for the establishment of a National Economic Council (Conselho Nacional de Economia), but legislation to implement this provision has not yet been enacted. The most influential planning agency at present is the National Security Council (Conselho de Segu-

2. Americo L. Barbosa de Oliveira, "O Desenvolvimento Planificado de Economia Brasileira," *Estudos Brasileiros de Economia,* Fundação Getúlio Vargas, Rio de Janeiro, Monografia No. 1, Ano 1, Vol. 1 (June 1946).

rança Nacional), for which provision is made in both the 1937 and 1946 Constitutions. The President of Brazil is chairman of the National Security Council, which includes the Cabinet members and the Chiefs of Staff of the Army, Navy and Air Force. It has several subcommissions, one of which, the Commission on Economic Planning (Comissão de Planejamento Econômico), was very active in 1944 and 1945 under the chairmanship of Valentim Bouças. The point of view of the National Security Council has been influential in connection with transportation, the establishment of "key" industries and the development of mineral resources.

In 1938 there was established the Departamento Administrativo do Serviço Público (DASP), which combines the functions of the Budget Bureau and the Civil Service Commission in the United States. It was headed by an able executive and reported directly to the President. Under Vargas it became an organ of great power and influence, and so was brought into conflict with the older ministries of state and with powerful individuals and groups. Though after his downfall it temporarily went into eclipse, President Dutra has again brought it into the center of the picture. Under his instructions, DASP prepared the national development plan now under consideration, known as the SALTE plan.

Sectional Interests and Agencies

In Brazil, as in the United States, economic policy is considerably influenced by the special problems and political pressures of the different states and regions. Since the shift of population and economic power to the south, most of the Presidents and higher officials have come from the two states of São Paulo and Minas Gerais. Vargas had been a former governor of Rio Grande do Sul. The last President from the northeast was Epitácio Pessôa (1919-1922), a compromise candidate from Paraíba. At the same time the eastern and northern states are strongly represented in the federal

bureaucracy, in diplomacy, in the military services and in the fields of journalism, literature and the arts.

Sectional interests were appeased in the drafting of the 1946 Constitution by the inclusion of a number of provisions requiring specified percentages of the annual tax revenues to be devoted to the economic development of particular regions. For example, Article 198 provides that not less than 3 per cent of the tax revenues shall be applied to drought relief and social and economic assistance to the northeast, Article 199 provides that during a period of twenty years 3 per cent shall be applied to the economic development of the Amazon region and Transitory Article 29 requires one per cent of the tax revenues to be devoted annually for a period of twenty years to a plan for the development of the economic possibilities of the São Francisco River and its tributaries.

Program for the Northeast

Drought prevention and relief in the northeast has received special consideration for many years. The larger part of six states on the "hump" of Brazil—Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Sergipe—and also parts of Piauí and Bahia, comprise the drought region. Part of this region receives less than ten inches of rain annually and about one third receives less than twenty-five inches. The real problem in much of the area is not so much the deficiency of annual rainfall as its uneven distribution, in both time and place, plus the nature of the soil and drainage, which adds to the difficulty of retaining and utilizing the water that actually falls.

The dry sertão began to be settled early in the sixteenth century, but the periodic droughts and floods did not present a serious problem so long as the population was sparse and the inhabitants could move from one region to another to take advantage of available moisture. Migration to other areas has also periodically drained off much of the surplus

population. However, this region has a strange fascination for many people, some of whom are incorrigible individualists who find it difficult to fit into the economic system prevailing in the more highly developed regions, and many of those who leave the region during periods of severe drought later return. About 1880, three years of severe general drought caused heavy casualties and drove 250,000 people out of the northeast. Spurred by this tragedy, the imperial government began a program of construction of dams. In 1909 the Inspetoria Federal de Obras Contra as Sêcas was organized, and work on the drought problem has continued intermittently since that time.

Up to 1943 the government had built 123 reservoirs with a capacity of 2,601 million cubic meters and had assisted private parties in building 207 smaller reservoirs of 402 million cubic meters capacity. The government has also drilled about two thousand wells, built several hundred kilometers of canals, has opened roads, established crop advisory services and attempted to stock the reservoirs with fish. A survey has also been made of the possibility of diverting part of the waters of the São Francisco into the Jaguaribe.

This large program has been only partially successful. It has provided some additional opportunities for permanent livelihood, but migration from the drought regions continues unabated. It might be possible to develop plantations of wax, oil or fiber plants suited to the region and having a high enough commercial value to justify the expense of the drought works, but many foreign observers familiar with the problem have not been very hopeful.[3]

The Amazon and São Francisco Basins

Commissions have been established to draw up plans for the development of the Amazon and the São Francisco valleys, but no definite programs have yet been approved. For the Amazon, some important programs would appear to

3. See Friedrich W. Freise, "The Drought Region of Northeastern Brazil," *Geographical Review*, Vol. 28 (1938), pp. 363-78.

be continuation of health and sanitation activities in selected areas, expansion of transportation and education facilities and encouragement of agricultural colonies devoted primarily to tree crops. Most of the population of the valley is afflicted by one or all of the four major scourges afflicting mankind: tuberculosis, malaria, worms and syphilis. The soil is too thin to support much agriculture, but additional rice could be grown on some of the semi-lowlands. Further efforts are being made to extend jute cultivation. The planting of suitable grasses would increase the livestock-carrying capacity. Forest culture offers additional possibilities for both tree crops and the production of lumber, railway ties, plywood, charcoal and alcohol.

The one hope for any large-scale or rapid improvement of the Amazon region lies in the development of the mineral resources of the valley, such as petroleum, manganese, iron ore and gold. No other type of product yields sufficiently high returns to justify the large expenditures required to do a really big job in this vast region. At the same time substantial improvement could be achieved through the establishment of regular and dependable shipping services, elimination of nuisance taxes and fees, and the organization of health and sanitation services at strategic points.

The São Francisco basin, although smaller than the Amazon, embraces an area of 229,210 square miles, with a total population of slightly over three million, most of whom live on a low economic, sanitary and educational level, with a resulting high rate of mortality. Many plans have been drafted for the improvement of the São Francisco region, going back over a period of nearly a century. However, despite the strategic location of the valley, very little has been achieved in improving basic conditions. Present official activities are of two principal types: first, the establishment of a mixed company to develop power at the Paulo Afonso falls and, second, the regular activities of the Ministry of Transport in connection with works to improve the naviga-

bility and control floods in the middle basin. A recent student of the problem has suggested the establishment of a São Francisco Valley authority to formulate and implement over-all plans for the development of the valley.[4]

State Plans for Economic Development

A number of the Brazilian states have prepared over-all plans for economic development. For example, the state of Minas Gerais in 1947 issued a Plan for Economic Recuperation and Development (Plano de Recuperação Econômica e Fomento da Produção). Also in 1947, Governor Octávio Mangabeira of Bahia appointed Ignacio Tosta Filho, the founder of the cacao institute and its president from 1931 to 1941, to draw up an economic plan for that state.

Several states have recently enacted laws authorizing the granting of exemptions from state taxes for periods of five years or more to new industries organized to utilize local raw materials. Federal Decree-Law No. 300 of February 24, 1938 provides exemption from import duties on certain machinery and raw materials required by new industries, provided local products are not available in sufficient quantity.

Goiás Attracts Settlers

The state of Goiás has attracted attention as having large areas suitable for colonization. Many thousands of Brazilian settlers have been moving into the state from the east and the south, and the governor is endeavoring to attract American and European farmers. Goiás has an area larger than any state of the United States except Texas, with a population less than one million. In south central Goiás is located one of the principal watersheds of Brazil, with rivers flowing north into the Amazon and south into the Paraná–Rio de la Plata system. This section of the state has a pleasant climate, hot by day but cool at night. The region has been mentioned as the possible site of the new national capital of Brazil.

4. Jorge Zarur, *A Bacia do Médio São Francisco,* Conselho Nacional de Geografia, Rio de Janeiro, 1946.

WORLD-WIDE ACCLAIM IN ARCHITECTURE has come to Brazil for a number of public buildings, apartment houses, hotels, etc., that have won international prizes. A fine example in the contemporary manner is this cacao institute, started by the state of Bahia in 1931 for research work to improve and protect the great cacao crop of Brazil.

The capital of the state, Goiânia, is a new "planned" city that has been developed rapidly. Anápolis, the second largest city, is connected by the Goiás Railway with the Rêde Mineira and the Mogiana railways, which provide rail outlets to Rio de Janeiro and São Paulo.

The grazing industry is the most important economic activity. There has been considerable expansion of rice cultivation in the valley of the Paranaíba, which forms the boundary between Goiás and the triângulo of Minas Gerais. A highway has been extended northward from Anápolis to Uruaçu, on the Tocantins River, from which point it is hoped to develop combined highway-river-railway transport to Belém.

The SALTE Plan

In his message of May 10, 1948, the President of Brazil submitted to the Congress a five-year plan for national development which attempts to coordinate existing federal and regional plans and to emphasize certain lines of activity. It concentrates on health (*saúde*), foodstuffs (*alimentação*), transportation (*transporte*) and power (*energia*). From the initial letters of these words, it is known as the SALTE plan.

The SALTE plan was drawn up by DASP (Department of Public Administration) with the help of other government departments, technicians of the federal government and the São Paulo State government. It has been reviewed by a commission including representatives of the principal political parties. It will probably be discussed for some time before Congress passes the enabling legislation, yet the support of the measure and the interest of President Dutra indicate that some plan of this nature may be enacted. A summary of the contemplated activities follows.

Health

Appropriations are suggested for increase in the number of hospitals and sanitary stations and purchase of new equipment, with particular attention to the principal diseases

such as respiratory maladies, tuberculosis, malaria, dysentery, venereal diseases and hookworm. The money would be employed to expand and support existing health services carried on by national and local governments and private agencies. The President has recently announced that he would recommend the creation of a Ministry of Health to supervise and encourage health activities.

Expenditures suggested by the plan for health over the five-year period are Cr. 2,620 million ($141 million).[5]

Food

Increased production of food will be sought, under the plan, by soil conservation, mechanization and disease control. A large fraction of the expenditure will be devoted to wheat, which now must be imported and hence is an important element in the balance of payments. Appropriations are suggested for twenty-five principal crops and products. The plan provides for the elimination of the Sugar Institute and the exercise of its functions by an agency in the Department of Agriculture. For other crops the plan does not include detailed proposals for the spending of the money, though it mentions construction of warehouses, purchase of machinery, and financing for growth and sale of the crops.

The report discusses general conditions affecting agricultural output, such as transportation, distribution, credit and market conditions. The need for larger food supplies might be met by immigration, which would make possible the cultivation of new land; but the report acknowledges that immigrants cannot be attracted until provisions are made for raising the standard of living. This conclusion is emphasized by the unhappy experience of an attempt to colonize rural areas of São Paulo—one of the most advanced states—with European displaced persons.

The appropriation called for in food is Cr. 3,700 million ($200 million).

5. Conversion of sums in connection with the SALTE plan is at 18.5 cruzeiros to the dollar.

Transportation

This part of the SALTE plan, though it calls for the largest expenditures of any of four sections, is based on plans for improvement already under way, and in part already financially provided for.

Railway construction and re-equipment will be carried out according to the national railway plan drawn up several years ago. The completion of the work of linking up the north and south is approved, as a means of developing the internal markets, but the danger of an "inmoderate extension of the railways" to sparsely inhabited areas best served by highways is recognized. The plan also calls for purchases of locomotives, passenger cars and freight cars. Railway construction, improvement and equipment are expected to account for 51 per cent of the total allotted to transport.

Roads will be built largely according to the scheme adopted by the National Highway Fund (Fundo Rodoviário Nacional), which was established by law in 1945. The plan will also include projects by the National Highway Department. The cost will be met out of the National Highway Fund and improvement taxes which it is expected to collect, with the exception of a relatively small additional sum now provided for. It is feared by critics of the plan that the labor supply will not be sufficient to construct all the contemplated highways and the new railroads as well.

Minor expenditures are allotted to re-equipment of ports, river and canal improvements, restoration of the merchant marine—which lost ships during the war by German submarine action—and the construction of an oil pipeline from Santos to São Paulo.

Transportation would, under the SALTE plan, call for the expenditure of Cr. 8,030 million ($433 million) excluding more than one third as much in addition, or Cr. 2,815 million, to be spent on roads out of the National Highway Fund.

Power

Since Brazil's greatest natural deficiency is in coal, and, at least up to the present, in petroleum, the plan lays emphasis on development of power resources. Such an increase would enlarge consumption, diminish the dependence on imported fuels and retard the destruction of forests which follows from extensive burning of wood.

The major part of the work assigned to the federal government is allotted to intensive exploration of oil areas, the building of refineries and the purchase of tankers. Petroleum consumption in Brazil is stated to be 50 kilos per capita per year as against 400 in Argentina and 1,200 in the United States.

A smaller amount is to be appropriated for federal development of hydroelectric power, the national electrification plan for transmission and distribution, rural electrification and financing the electrical equipment industry. States, municipalities and territories are expected to spend nearly as much for the electrical power program as the national government. Private investment is to be called upon for the greater part of the program. Out of a total estimated expenditure on electricity of Cr. 6,822 million ($369 million, at Cr. 18.5 per dollar), only Cr. 750 million ($40 million) is allotted to the federal government.

Financing the SALTE Plan

Total expenditures for the five years of the plan are estimated at Cr. 25,722 million ($1,389 million). About a third of the total is to be spent by local governments and private utilities. (See Table 22.)

The plan recognizes that resort to the printing press or any arrangement which might be inflationary is to be avoided. It also recognizes that the market for government obligations is limited and that in any event the financing of such projects by long-term loans has not proved very successful in the past. The funds to meet the federal government's share of

TABLE 22

ESTIMATED EXPENDITURES FOR THE SALTE PLAN, OVER FIVE-YEAR PERIOD, 1949-1953

	Millions of Cruzeiros	*Millions of Dollars* [a]	*Per Cent of Total*
Health	2,620	141	14.3
Foodstuffs	3,700	200	20.2
Transportation	8,030	433	43.9
Power	3,250	176	17.8
Interest	700	38	3.8
Total to be spent by federal government	18,300	988	100.0
Amount to be spent by states, municipalities, and private companies on power development	7,422	401	
Total of plan	25,722	1,389	

a. Converted at 18.5 cruzeiros to the dollar.

the plan, amounting to Cr. 18,300 million ($988 million), would come from these four main sources: regular budget, 47.4 per cent; constitutional appropriations, 8.3 per cent; loan on exports, 26.2 per cent; other loans, 18.1 per cent. (See Table 23.)

At present there is an arrangement whereby exporters receive 20 per cent of the value of their exports in the form of Treasury notes. According to the plan this 20 per cent requirement would be eliminated before the SALTE program went into effect. Its place would be taken by the 5 per cent compulsory loan arrangement described above. From the proceeds, Cr. 1,400 million would be applied to liquidating the Treasury notes already so issued.

Foreign exchange will be borrowed from the Bank of Brazil (the holdings of nonconvertible currencies) and no interest will be paid on this loan.

TABLE 23

SOURCES OF FUNDS FOR FEDERALLY FINANCED PORTION OF SALTE PLAN, OVER FIVE-YEAR PERIOD, 1949-1953

	Millions of Cruzeiros	*Millions of Dollars* [a]	*Per Cent*
Appropriations ordinarily included in the regular federal budget	4,000	216	21.9
Revenue from a 40 per cent increase in the tariff	3,000	162	16.4
Revenue from the investments of the plan itself (about 10 per cent of expenditures)	1,680	91	9.2
Regular budget	8,680	469	47.4
Other appropriations to be included in the regular budget as required by the Constitution [b]	1,520	82	8.3
Constitutional appropriations	1,520	82	8.3
Loan (5 per cent of exports) to be known as "Obrigaçoes do Plano SALTE"	4,800	259	26.2
Loan on exports	4,800	259	26.2
Borrowing a part of Bank of Brazil's exchange holdings	1,800	97	9.8
Borrowing on profit resulting from the sale of DNC (National Coffee Department) coffee stocks	1,500	81	8.2
Other loans	3,300	178	18.1
Total federal expenditures	18,300	988	100.0

a. Converted at 18.5 cruzeiros to the dollar.

b. The Constitution of 1946 required that the budget every year should include appropriations to cover expenditures in the Amazon and São Francisco valleys and in the northeast (drought problem). These appropriations would now be incorporated into the SALTE plan.

The three loans (exports, exchange and coffee) will be amortized in the first four years after the completion of the five-year plan, namely 1954-1957.

A revolving fund (*fundo rotativo*) will be set up in connection with the operations of the plan and will also be used to finance production. The fund will be made up of: (a) receipts from the sale of part of the DNC coffee stocks in the second half of 1948; (b) revenues from the increase in the tariff; and (c) revenues from the financing of crops undertaken by the federal government. It is estimated that from these three sources the fund can obtain Cr. 800 million.

The bill provides (Article 4) that the budgets of 1949 through 1953 will contain the following appropriations (in millions of cruzeiros):

	Appropriations for SALTE Plan	*Compulsory Appropriations* *
1949	1,100	240
1950	1,500	315
1951	1,850	340
1952	2,100	310
1953	2,130	315
	8,680	1,520

* These are the amounts which will be deducted from appropriations required by the Constitution and which will be incorporated into the SALTE plan.

The revenue of the National Highway Fund and of the improvement tax (*contribuição de melhoria*) will be applied to road-building projects (Article 5).

The amortization of the borrowings provided for in the plan would be effected in the period 1954-1957 by an annual appropriation of Cr. 2,400 million (Article 13).

Imports Required for the Plan

It is estimated that a third of the federal expenditures under the plan, or Cr. 6,100 million ($330 million), will be made abroad. Brazil's existing export surplus will provide part of the necessary foreign exchange. Additional means

to buy these goods may be obtained by increasing the value of exports and decreasing imports. The framers of the plan believe that it will stimulate exports and reduce the need for imports of currently used commodities. The agricultural program is expected to produce more wheat in the near future, thus diminishing the need for foreign wheat. The price of wheat bought from Argentina has already been reduced. Success in the exploitation of petroleum would eventually decrease imports of oil products. Imports may be reduced by the new 40 per cent increase in tariff, but any effect of this kind would be accompanied by reduction of the revenue expected from that measure and by increases in the domestic cost of living unless necessities are exempted.

It seems too optimistic, however, to rely on any increase in production resulting from the execution of the plan to provide the immediate means of payment for all the capital goods which will be required. Foreign credits will undoubtedly be needed, especially if, as Brazilian critics of the plan believe, it overestimates the possibilities of prompt increase of agricultural production.

The plan includes foreign financing, especially for the private projects. Among these is the proposed International Bank loan of $75 million to the Brazilian Traction, Light and Power Company, Ltd.

Is the Plan Inflationary?

Ingenious details of financing the plan without increasing note issues cannot conceal the fundamental truth that any large expansion of investment expenditure which does not derive its funds from saving or tax revenue is bound to result in an increase of total demand. Unless production is enlarged correspondingly, an upward pressure on prices will be the outcome. As a rule, even in the case of productive investment, the effect on demand of the spending for new equipment and plant is felt before the additional products resulting from the investment come on the market. The

probability, however, that some upward pressure on prices will result should not deter the expansion of productive facilities, provided the ultimate effect is to increase the goods available for human consumption.

The inflationary danger must be assessed in connection with the relative magnitude of the undertaking. It is estimated that the contemplated additional expenditures over normal budgets are less than 3 per cent of the national income. If this estimate is even approximately correct, the increase in demand should be easily borne.

As a matter of fact, the plan is modest in comparison with Brazil's urgent needs. The pace of development set by it may strain existing resources at various points, but in general should not be impossible to maintain, provided good supervision and management are employed.

Main Merits and Dangers of Plan

When this book went to press it was impossible to review the details of the SALTE plan; these details may change before the program is executed. Already special interests have attempted to smuggle in activities that might better be omitted.

In general, the plan has great merits. It has chosen for emphasis the fields where need for development is most urgent. Although it attempts to cover too much ground, on the whole it avoids the grandiose or the spectacular, and has chosen practical objectives for the expenditure of funds and resources. Furthermore, it recognizes that the major part in development would better be undertaken by private enterprise, and sets as the task of government the establishment of a suitable framework and the promotion of the chief necessities for progress. Finally, the requirements for foreign financing are modest in relation to Brazil's resources. Most of the job is to be done with Brazilian resources.

The dangers that may interfere with effective action are also obvious. Favorite projects of special groups, having no

essential relation to the main objectives, may be attached to the general plan, as a consequence of political pressure. Since the plan is to be carried out under the several regular agencies of the executive, there may be a lack of unified, effective over-all direction to prevent the dispersion of funds and energies. And some aspects of the proposed financing require closer scrutiny.

Sources of Foreign Credits

The main aim of the SALTE plan is to create basic conditions which will be favorable to economic growth. The development of manufacturing industries (other than heavy electrical equipment) is outside its scope, and the expansion of electrical utilities, included in the plan, is left primarily to private enterprise. Opportunity for private capital, both Brazilian and foreign, should be created by any advances registered in the basic program.

Regardless of the fate of SALTE, any large-scale economic development in Brazil will require some external financing. Foreign capital or credits may be obtained from the following sources: private investors, mobilization of frozen credits in Europe, the International Bank, the Export-Import Bank of Washington, and the United States government.

The extent of private international investment over the next five years or so cannot be foreseen with any exactness, particularly in view of uncertainties about mining, petroleum and other legislation, but a reasonable expectation would place the requirements in the neighborhood of $30 million or $40 million a year, in public utilities, minerals, manufacturing, hotels, service industries, food processing and distribution, merchandising and purchase of stocks and bonds. These sums might be considerably larger in case a basis is reached for foreign participation in petroleum and mining developments.

A large part of the foreign financing required in the near future will be for projects of a public or quasi-public char-

acter. It is not possible to draw a sharp line of distinction between public and private projects. For example, power is being developed primarily by private companies aided by public funds.

Brazilian frozen credits in Europe may be utilized for a fair proportion of the equipment needed by Brazil over the next five years or so, if European recovery permits. But the main reliance will be on the United States both for goods and for technical services not available in Brazil. Credits from the Export-Import Bank or the International Bank (depending on the nature of the credit) aggregating $200 million or $300 million over the next five years are considered warranted. Vast sums are not required, nor could they be laid out wisely and effectively within a limited time. On the other hand, credits should be ample, spread over a period of years, to ensure the completion of the project or projects for which made.

Apportionment of Credits

Transportation may be expected to absorb 50 per cent or more of any foreign currency credits: they will be expended for railway equipment, highway construction, river transportation and port improvement. New and additional telecommunications equipment is also required. Electric power development, including both public and private projects, will probably be next in importance.

If the railways are to be made into an asset, some way must be found to free them from political pressure so that they can be operated on an efficient and economical basis. Brazil is not lacking in able railway executives and technicians. The fine record of the Paulista Railway is ample evidence of what can be done. Brazil must make the decision whether railway operations, as well as other activities, are to be entrusted to governmental or to private entities, but foreign lenders cannot be indifferent to the results achieved. The railway plans should also be re-examined to put more

emphasis on the rehabilitation of the transportation system in the southeast. The establishment of connections with the northeast is desirable eventually, but at present it will merely increase the deficit and provide competition for the coastwise shipping services that are more important at this stage of development. In practice, the lines now being built could not move any large amount of cargo in times of emergency.

Colonization and agricultural development is obviously one of the most important fields, but the foreign currency requirements for these activities are somewhat less than for transportation and power. More attention might well be given to the expansion of some existing export crops, such as cacao, vegetable oils and hard fibers, as well as to the export possibilities of beans, fruits, fruit juices, manioc products (starch, tapioca) and woods. Larger mineral exports would help to pay for transportation and port facilities as well as provide the foreign exchange needed to pay for imports of capital goods.

The health and sanitation program is of great importance, and the foreign currency outlays needed are substantial, for pipe, well-drilling, pumping and earth-moving equipment, for chemicals, for hospital equipment and for salaries of foreign technicians. It would be desirable to continue the program under the auspices of the Institute of Inter-American Affairs for a period of at least five or ten years, involving total appropriations of $10 to $25 million. More important than the exact amount of the appropriation is continuity, since it is impossible to develop a long-range joint program or to hold a competent staff on any other basis.

The Role of the United States

Any improvement which Brazil is able to realize in better health, increased longevity, improved skills, more efficient utilization and conservation of natural resources, and a consequent enhancement of productivity, will benefit not only the people of the nation but those of the whole world.

Many of these advances, such as education and housing, must rely primarily on Brazil's own efforts, yet cooperation from abroad is essential for a rounded program. This cooperation will not be a one-way street. A prosperous Brazil will have a large and continuing need for equipment, manufactured specialties and various raw materials, and in turn will provide a surplus of many raw materials and processed articles in the production of which it has comparative advantages.

The United States, in particular, has long been Brazil's chief customer and one of its leading suppliers. The different geographic position of the two countries and the character of their resources have encouraged this interchange. The variety of Brazil's exports to the United States, as well as to other markets, has expanded and is capable of further enlargement. The United States needs, in both peace and war, many articles that Brazil can provide.

During the recent war the United States played an active role in mobilizing the production and export of scarce supplies from Latin America. It cannot afford to be negligent of the needs of the Brazilian people in peace. Its position of power and responsibility requires it to take the lead in policies and programs of a positive and constructive character.

The case for continuing cooperation between the United States and other American republics in the development of resources and industries was stated cogently by President Truman on April 8, 1948 in a message to Congress requesting an increase in the Export-Import Bank's lending authority.

"It is of great importance to the United States," he said, "as a member of the American community, that there be continued expansion of production, increasing trade activity and rising standards of living in the other American republics. It is in our mutual interest to help develop in the countries to the south those essential materials which are

becoming less abundant in the United States, as well as others regularly imported from distant regions.

"Above all, it is in our mutual interest to assist the American republics to continue their economic progress, which can contribute so much to the cooperative strength of the independent American republics."

APPENDICES

Appendix 1

SOME LEADING AMERICAN COMPANIES IN BRAZIL

Manufacturing

Abbott Laboratories
American International Corp.
Anderson, Clayton & Co.
Armour & Co.
"Automatic" Sprinkler Corp. of America
The Brunswick-Balke-Collender Co.
Corn Products Refining Co.
Corning Glass Works
E. I. du Pont de Nemours & Co.
Electric Auto-Lite Co.
Ferro Enamel Corp.
The Firestone Tire & Rubber Co.
Ford Motor Co.
Foster-McClellan Co.
General Electric Co. (through International General Electric Co.)
General Motors Corp.
Gillette Safety Razor Co.
The Goodyear Tire & Rubber Co. of South America
Henningsen Produce Co., Fed. Inc., U. S. (through Harkson do Brasil)
Hobart Manufacturing Co.
Hoffmann-LaRoche, Inc.
International Telephone & Telegraph Corp. (through International Standard Electric Corp.)
Johnson & Johnson
Lanman & Kemp-Barclay & Co., Inc.
Lone Star Cement Corp.
Monsanto Chemical Co.
Otis Elevator Co.
Parke, Davis & Co.
Pullman-Standard Car Export Corp.
Rheem Manufacturing Co.
St. Regis Paper Co.
Scott & Bowne
The Sherwin-Williams Co.
Standard Brands, Inc.
Standard Oil Co. (New Jersey)
Sterling Drug, Inc.
Swift & Co.
William R. Warner & Co., Inc.
Wayne Pump Co.
The S. S. White Dental Mfg. Co.
Wilson & Co., Inc.

Merchandising

Addressograph-Multigraph Corp.
The Armco International Corp.
Associated Telephone & Telegraph Co. (through Automatic Electric Sales Co., Ltd.)
Bausch & Lomb Optical Co.
Burroughs Adding Machine Co.
J. I. Case Co.
Coca Cola Co.
Colgate-Palmolive-Peet Co.
Congoleum-Nairn, Inc.
Coty International Corp.
Eastman Kodak Co.
W. R. Grace and Co.
The Great Atlantic & Pacific Tea Co.
Hard, Rand & Co.
Ingersoll-Rand Co.
International Business Machines Corp.
International Harvester Co.
S. C. Johnson & Son, Inc.
Lanston Monotype Machine Co.
Geo. H. McFadden & Bros.
Markt & Co.
Mergenthaler Linotype Co.
National Cash Register Co.
RCA Manufacturing Co., Inc.
Helena Rubinstein, Inc.
Scholl Manufacturing Co.
Sears, Roebuck & Co.

Singer Sewing Machine Co.
United Shoe Machinery Corp.
United States Steel Export Co.
Westinghouse Electric & Manufacturing Co.
Worthington Pump & Machinery Corp.

Banking

First National Bank of Boston
National City Bank of New York

Mining

American Smelting & Refining Co.
United States Steel Corp.

Petroleum

The Atlantic Refining Co.
W. R. Grace & Co.
Gulf Oil Corp.
Standard Oil Co. (New Jersey)
The Texas Co.

Public Utility

American & Foreign Power Co., Inc.
International Telephone & Telegraph Corp.

Transportation and Communications

All America Cables & Radio, Inc.
American Steamship Agencies, Inc. (Delta Line)
Moore-McCormack Lines, Inc.
Pan American Airways, Inc.
Press Wireless, Inc.

Miscellaneous

American Express Co.
N. W. Ayer & Son, Inc.
Columbia Pictures Corp.
Dun & Bradstreet, Inc.
General Motors Acceptance Corp.
Great American Insurance Co.
The Home Insurance Co.
Loew's Inc.
McGraw-Hill International Corp.
Metro-Goldwyn-Mayer Corp.
Paramount Pictures Corp.
RKO Radio Pictures, Inc.
J. Walter Thompson Co.
The Timken Roller Bearing Co.
Twentieth Century-Fox Film Corp.
United Artists Corp. (Delaware)
United Press Associations
Universal Pictures Corp.
Warner Bros. Pictures, Inc.

Appendix 2

SOME LEADING BRITISH COMPANIES IN BRAZIL

Bank of London & South America, Ltd.
Brass & Cia., Ltda.
Brazilian Traction, Light & Power Co., Ltd.
  Affiliate companies in Brazil:
    The City of Santos Improvements Co., Ltd.
    Cia. de Carris, Luz e Força do Rio de Janeiro, Ltda.
    Cia. Telephonica Brasileira
    The São Paulo Gas Co., Ltd.
    The São Paulo Tramway, Light & Power Co., Ltd.
    S. A. du Gaz de Rio de Janeiro
Brazilian Warrant Co., Ltd.
  Affiliate companies in Brazil:
    Cia. Paulista de Amazens Gerais
    E. Johnston & Co., Ltd.
British South American Airways
Casa Anglo-Brasileira (successor to Mappin Stores)
Cia. Indústria e Comércio Glossop
Cia. Radio Internacional do Brasil
Cia. Radiotelegráfica Brasileira
Davidson, Pullen & Cia. (general agents for "Phoenix" Assurance Co., Ltd.)
Eno (Brazil), Ltd., J. C. (distributors for Macleans Ltd.)
Great Western of Brazil Railway
Houlder Brothers & Co. (Brazil), Ltd.
Importadora e Exportadora Frisbee Freire, S. A.
Intimex, Sociedade Internacional de Importação e Exportação, Ltda.
Lamport & Holt Navegação, S. A.
The Leopoldina Railway Co., Ltd.
Lowndes & Sons, Ltda.
Mappin & Webb
The Rio de Janeiro Flour Mills & Granaries, Ltd. (Moinho Inglês)
The Royal Bank of Canada
Royal Mail Agencies (Brazil), Ltd.
St. John del Rey Gold Mining Co., Ltd.
Shell-Mex Brazil, Ltd.
Singlehurst & Co., Ltd., R.
Sloper & Co., Ltd.
Thornycroft Mecânica e Importadora, S. A.
Walter & Co.
The Western Telegraph Co., Ltd.
Wilson, Sons & Co., Ltd.
Wilson Jeans & Co., Ltd.

Appendix 3

SUMMARY OF THE REPORT OF THE JOINT BRAZIL–UNITED STATES TECHNICAL COMMISSION *

PART I

The need for a broad development program in Brazil is indicated by the low productivity and small incomes of the majority of its people and by indications of serious unbalance in its economic structure. One indication of unbalance has been the persistent tendency toward price inflation which, of course, was accentuated during the war but has continued in the post-war period. Another is the difficulty of holding imports within the limits of foreign exchange availabilities. Among the factors contributing to Brazil's difficulties in solving these chronic problems have been the excessive concentration of exports in a few agricultural crops; the concentration of the purchasing power of the wealthy and the middle class in two great cities, the growth of which has been accelerated by industrialization; the low productivity and general backwardness of much of Brazil's agriculture; and the exhaustion of the soil and the progressive movement of agriculture farther and farther from the consuming centers, which has had the effect of throwing additional burdens on an already inadequate transportation system.

* Pursuant to a request of the Brazilian government, a joint committee of Brazilian and American technicians was created by authority of President Truman and President Dutra for a broad appraisal of the manner, directions and rates of development of the Brazilian economy. The United States delegation, headed by John Abbink, Chairman of the McGraw-Hill International Corporation, New York City, arrived in Rio de Janeiro on September 7, 1948, where it joined the Brazilian delegation headed by Dr. Octavio Gouveia de Bulhões, Chief, Division of Economic and Financial Studies of the Minister's Cabinet, Ministry of Finance.

The report of the Joint Brazil–United States Technical Commission was made after the Twentieth Century Fund's study was completed and in press. The summary reproduced here was released by the State Department in time for inclusion in the Appendix, and it is expected that the complete report will be published by the time this volume appears. Space does not permit discussion of the recommendations of the Joint Commission beyond the observation that in general they confirm the conclusions reached in our study. The differences relate primarily to matters of emphasis, arising in part, at least, from the nature and objectives of the two investigations.

—GEORGE WYTHE

Progress in economic development is made difficult by a number of other factors. Among these are the country's inadequate supplies of fuels and power; the speculative emphasis in the economy and what has been called a "high-unit-profits" mentality in industry and trade; the strong attraction of investment funds into urban real estate at the expense of other investments more essential to the progressive economy; and the lack of well-developed capital markets. The continuous rise in the general price level during the last ten years has aggravated these difficulties.

The Commission is unanimously agreed that the economic development of Brazil should be accelerated by carefully considered programs of governmental expenditures, by policies favoring a balanced development of Brazil's resources by private enterprise, and by policies directed specifically toward controlling inflation and meeting the balance of payments problem.

Economic Development and the Balance of Payments Position

In considering a development program for Brazil it is necessary to consider, on the one hand, how such a program may be affected by the limited availability of foreign exchange and, on the other hand, how a development program can help to solve Brazil's persistent foreign exchange problem.

During the war and for a short time thereafter Brazil was able to find temporary markets abroad for some of its manufactured products. Meanwhile good prices were received for Brazil's exports of raw materials. Because of the difficulty of obtaining imports, the value of exports exceeded that of imports by 14 billion cruzeiros from the end of 1941 to the end of 1946, and Brazil's holdings of gold and foreign exchange increased by 12½ billion cruzeiros (U.S. $675 million).[1]

The growing availability of imports brought a sharp reversal of Brazil's trade position in 1947. In that year imports exceeded exports by Cr. 1½ billion, while other payments due abroad raised the total balance of payments deficit to Cr. 3 billion. The most serious aspect of this change in Brazil's trade position was the difficulty of obtaining imports from Europe to balance exports to that area and the heavy excess of imports from the United States and other "hard-currency" countries over exports to those countries. As a result Brazil had an export surplus of about Cr. 5 billion with "soft-currency" countries but a deficit of Cr. 6 billion with hard-currency

1. The official exchange rate of 18.50 cruzeiros to the dollar has been used throughout this summary.

countries. Among the sources of funds to meet this deficit was a short-term stabilization loan of Cr. 1½ billion (U.S. $80 million) from the United States. However, approximately Cr. 1½ billion of payments due to hard-currency countries remained unpaid at the end of 1947.

This unbalance in Brazil's trade position necessitated the adoption in May 1948 of import controls to supplement foreign exchange controls. Before the import controls could be imposed, the backlog of payments due in hard currencies increased to about Cr. 3 billion.

A review of the prospects for the near future indicates that maintenance of firm controls will be required even if Brazil's exports remain at a high level, as without such controls hard-currency imports would undoubtedly tend to run substantially in excess of the availabilities of such currencies. The arrearage of commercial and other payments due abroad will need to be cleared up before export proceeds will be at all fully available for the purchase of equipment and other supplies needed for a development program in addition to other essential imports.

Brazil still holds a considerable amount of gold reserves, but there are good reasons for conserving a substantial part of these reserves for purposes more essential to the future welfare of the country than to use them to pay for past imports. Possibilities of obtaining short or medium-term credits abroad to finance part of the 1949 imports of essential goods should be explored, to permit the use of a larger part of current receipts from exports to expedite the payment of overdue bills.

In the absence of clear evidence that Brazil's export production is being restricted by unavoidably high costs relative to prices obtainable in world markets, devaluation of the cruzeiro must be regarded as an unnecessary and undesirable alternative or supplement to import and foreign exchange controls, since under these circumstances devaluation would only create additional upward pressure on the Brazilian price level and the cost of living.

Import and foreign exchange controls should be supplemented by strong efforts (1) to broaden and improve Brazil's exports, (2) to develop efficient domestic production of a number of industrial products and additional domestic sources of fuels, the imports of which now weigh heavily on Brazil's international balance of payments, and (3) to attract foreign capital and technicians to assist in these developments. Without the aid of such capital, the amounts of foreign exchange which will be available for the purchase of essential supplies and equipment are likely to be so limited during

the next several years as seriously to retard Brazil's industrial and general economic development.

Financial Stability as an Aid to Economic Development

The Commission is convinced that balanced and rapid economic development, of a kind that would bring lasting benefits to all the people of Brazil, cannot be achieved in the face of rapidly or continuously mounting prices. It is not expected that Brazil can insulate her price level completely against changes in world markets, but world prices (especially prices in the United States) are showing signs of becoming stabilized or even declining somewhat, and strong efforts must be made to prevent a further rise in prices in Brazil that has no parallel in world markets.

Stabilization of the money supply in 1947-48 through avoidance of new Government note issues or borrowing from the banks and through restraint on extensions of bank credit to other borrowers was an essential element in checking the long-continued rise in the Brazilian price level. A firm policy of controlling credit expansion is still necessary and will continue to be necessary so long as stabilization of the price level has not been achieved. An enlargement of the Bank of Brazil's loans to farmers would be helpful in increasing agricultural production, but any substantial expansion of the Bank's loans to farmers should be balanced by reductions in other parts of the Bank's portfolio.

The success of the Brazilian Government in achieving a small surplus of receipts over expenditures in 1947 and the first eleven months of 1948 has been an important factor in restraining the rise of prices. The prospect for 1949 is less certain because of a 25 per cent increase in Government salary scales. However, firm adherence to the rules of economy laid down by the President of the Republic should remove the possibility of expenditures outrunning revenues in 1949. In fact, there should be a moderate amount of funds available for the beginning of an economic development program such as that outlined in the SALTE Plan. Budgetary and financing policies will of course assume increased importance as the execution of such a program gets under way.

PART II

Development Programs for Various Sectors of Brazil's Economy

The needs of the various sectors of Brazil's economy are many and varied. They are not mutually exclusive; to a great extent they are complementary. For example, there is no point in debating

whether to promote industrialization or to promote agricultural development; both are necessary.

An improved and more productive agriculture would promote industrialization by producing more economically and in larger quantity raw materials for processing in domestic industries. It would release workers for industrial employment without jeopardizing, or increasing the cost of, the food supply of the industrial and other urban population. It would provide a larger domestic market for the products of industry.

The other side of the picture is that expanded and more efficient industries would mean larger domestic markets for agricultural raw materials, and should mean more and better manufactured goods at prices that would bring them within the reach of larger numbers of the farm population.

But further development of industry and agriculture is not enough; in fact, their possibilities are limited unless other requirements can be met. If industrialization is to make substantial progress in Brazil, it must have larger, more dependable, and, if possible, cheaper supplies of fuels and power, more adequate and efficient transportation, more and better equipment, and a larger supply of skilled labor and of technical and managerial talent. Similarly, expansion and improvement of industry alone is not enough to assure the greater well-being and prosperity of the large farm population. Brazil's agriculture also needs better transportation (and storage) facilities, but above all it needs improved methods, much greater use of fertilizers, and improved implements.

There are limits to the extent to which any one major sector can prosper if others are lagging seriously. But a well-balanced development will not be easy. Some of the most urgent requirements, such as improved and enlarged transportation facilities, ample fuel supplies at reasonable prices, and adequate and dependable supplies of electric power, will call for very large investments of capital, the provision of which will present an imposing problem in view of the poor financial condition of many of the railroads, the limited opportunities for profit-making in some public utilities, and the high costs and risks inherent in petroleum exploration and production.

The basic requirement underlying any reasonable expectation of substantial progress in the economic development of Brazil and in the attainment of generally better living conditions for its people is, of course, increased productivity. The list of specific requirements which need to be met in order materially to increase the productivity of the country and to promote the health and wel-

fare of its people is so long, and the expenditure involved so great, that its complete fulfilment must necessarily be a long-term program. The problem of financing a comprehensive development program is a difficult one, not only as to the financing of expenditures abroad for mechanical equipment and supplies, but also as to the financing of domestic expenditures. And the financing problem is not the only one.

In view of the fact that there is practically no unemployment in Brazil and little surplus capacity for producing the materials that are likely to be needed, the ability of the country to carry out development projects presumably will be largely limited, at the outset, to the supplies of labor and materials (and financial resources as well) that can be diverted from less essential activities. This will probably require modest beginnings in undertaking a development program. But it is a reasonable expectation that by a real effort to do as much as possible with the country's own resources, supplemented by the equipment and technicians that may be obtainable from abroad with the aid of foreign capital, an important start can be made toward the solution of all of Brazil's major problems which will bring appreciable results fairly soon and make possible an acceleration of progress in subsequent years.

In view of the limited human, material and financial resources which are likely to be available at the beginning, however, it is of the utmost importance that the initial program be well balanced and that emphasis in each sector be placed on dealing first with the most urgent needs.

Agriculture

Improved conditions and increased productivity in agriculture must be given an important place in any program for the economic development of Brazil, since approximately two-thirds of the inhabitants of the country gain their livelihood from agricultural pursuits. The number of people on the land has been steadily growing, and the total acreage under cultivation increased 12 per cent between 1937-39 and 1946. These trends will probably continue, but it is also likely that the urban population will continue to grow at a faster rate. Only through increased productivity *per man* in agriculture can an adequate supply of food be provided for the farm and city populations and a surplus of agricultural exports over imports be maintained.

Among the requirements for material improvement in Brazil's agriculture are an expanding agricultural research program and an adequate extension service (closely coordinated with the research

work) to bring the benefits of research effectively to the farms. The Federal Government's limited activities in the latter field are now supplemented by State programs in São Paulo, Rio Grande do Sul, Bahia, and (very recently) Minas Gerais. All the States should have the benefit of such service, and this can best be assured by joint Federal and State participation. There is a great need for more trained agriculturists and home economists to carry on this work.

Among the problems for which Brazilian farmers and livestock producers need technical assitance are (1) mechanization, including the shift from hoe culture to the use of simple animal-drawn implements where the use of more complex machinery is not feasible, (2) soil and water conservation, (3) fertilizer use, (4) plant and animal improvement, (5) insect and disease control.

The need for soil conservation measures is most evident in the lands of the east-central region over which the tide of coffee culture has passed from east to west.

The high cost of commercial fertilizers in Brazil, relative to agricultural prices, must be reduced sharply before a large increase in their use can be expected.

The progress already made in introducing hybrid seed corn and selected cotton seed, in upgrading cattle herds with the Zebu breed, in developing a method of poisoning the coffee "broca," and in producing disease-resistant rubber plants, offer examples of plant and animal improvement and insect and disease control in Brazil.

There is urgent need for expanded storage and warehouse facilities for agricultural and livestock products to reduce spoilage, to smooth out irregularities in the flow of food supplies to consuming centers, and to allow effective functioning of Brazil's program of price supports for certain food crops.

The provision of adequate, and in many cases supervised, credit for agricultural producers is a task of great complexity. The cost will be high, not so much in terms of money, as in terms of the detailed, painstaking work and the practical idealism required. Any hope that the mere setting up of new institutions can by itself solve the rural credit problem is bound to be disappointed. However, expansion, strengthening and decentralization of the Bank of Brazil's Agricultural Credit Department could improve the credit services available to large and medium-sized farms. In particular, longer periods of repayment are needed for certain types of loans.

The most complex and challenging task concerns the small holders, "colonos," and sharecroppers, who can offer no secure basis for credit at present, but who are particularly important in the production of food crops. It is suggested that the financing of small

farmers be tied in directly with the educational work done by the agricultural extension services. This project should be started on a limited scale and gradually extended throughout the country.

Fisheries

Brazil is not at present a large producer of fish, when its population is taken into consideration. A long-range program has been drawn up, with the goal of a three-fold increase in the production and distribution of fresh, canned and salted fish. This program envisages operation of an expanded fishing fleet, of receiving ports, and of refrigerated transportation and marketing facilities, with Government financial aid and supervision. It includes also technical and educational work to promote the sound development of the fishing industry.

Industrial Development

Brazilian industrial development has made substantial progress during the past 50 or 60 years. The first world war greatly stimulated Brazil's industries, particularly cotton textile manufacturing. In 1939 food processing and beverages accounted for about one-quarter of the total production value added by manufacturing, and textiles and clothing for another quarter. The commencement of operation of the Volta Redonda steel plant near the end of the second world war marked another major step in Brazilian industrial development. Other industries which have attained a sizeable output include cement, glass, paper and pulp, pharmaceuticals, certain chemicals, leather, shoes, matches and furniture.

Productivity per worker is, in many cases, considerably less than in the leading industrial countries. There is a very high percentage of small shops which can not use modern production engineering techniques. Even in some of the larger plants, poor factory layout, the use of obsolete and overage machinery subject to frequent breakdown, the lack of constant-grade raw materials, the absence of standardization of product, and insufficient specialization in plant output, all tend to bring down the average output per worker. Obviously, new equipment is one of the essential requirements for the progress of numerous industries.

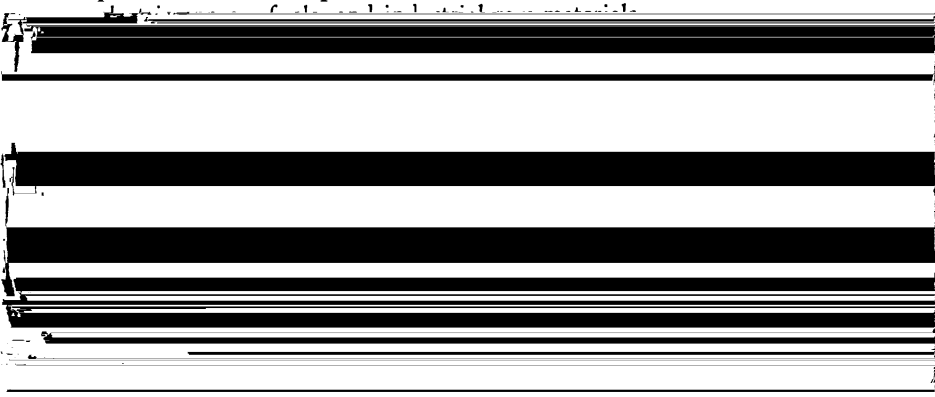
The practice of seeking high profits from a limited market, rather than greater returns from large competitive markets, may also tend to retard progress. President Dutra has referred to this "high-unit-profit mentality" in the following words:

> At times, enterprises are set up, without the prospect of a successful performance in the face of market resistance, which aim solely to derive a

high profit with least possible effort. Present world conditions no longer support such a conception of deriving high profits on small-scale operations. Only mass production would stimulate the labor market and reduce the cost of products to meet social and economic needs, in other words, to achieve a well-balanced level of salaries and cost of living.

Increased and more efficient production of Brazil's manufactured exports should be possible; this would help to assure continuance and expansion of their markets abroad. There are also numerous possibilities for new (or increased) production, where justified by considerations of cost and demands, of goods now imported and for the manufacture of which the principal raw materials are now or could be made available locally. If Brazil's best interests are to be served by devoting human, material and financial resources to producing more of the goods that are now imported, however, care should be taken, in formulating Government policies affecting industry, not to stimulate inefficient or costly schemes incapable of producing goods to sell at reasonable prices.

Steady progress in industrial development will depend on improvements in transportation, communications, and the supply of



Transportation

Every segment of the Brazilian economy is vitally dependent upon development of the nation's transportation system. In promoting such development, however, it is essential that the transportation requirements of Brazil—railways, roads, airways, rivers, ports, coastal shipping—be considered as a whole, rather than only separately. For example, the economic value of a given railway may be dependent upon the construction of local roads adequate to service it. On the other hand, the construction of a given highway may be possible only by diverting resources away from the construction of local roads or of a railway.

The Brazilian *railroad* system has suffered from the overburdening and increasing age of existing rolling stock, due in part to financing

The most pressing need is for reconstruction and reequipment of existing lines, in order to increase the density of traffic and reduce the costs per ton-kilometer. Although expansion of railroads into new areas should generally be avoided at this time, encouragement should be given to investment in railway extensions designed to meet specific and clearly economic requirements, created by existing or potential developments, as for example in heavy industry, in mining or in livestock slaughtering and refrigeration.

Among steps which should be considered, in order to put existing railroads on a fully remunerative basis, are improvement of management, consolidation of companies, abandonment of some uneconomic branches, and continued review and readjustment of traffic rates. It would be desirable, also, to take all feasible steps toward the standardization on one track gauge of all Brazilian railroads.

Highway construction in Brazil is financed in considerable part by Federal taxes on petroleum products which accrue to the National Highway Fund. Allocations to States and "municipios" (counties) are required by the Constitution, and in practice these allocations are predicated upon the construction of such roads, and the use of such procedures, as are approved by the National Highway Department.

There is a pressing need for the construction of improved State and local roads. Until Brazil has taken the measures necessary to make use of its petroleum resources, the most important needs for Federal highway construction will be in areas of high density of population and production which are now inadequately served by railroads or coastwise shipping. Resurfacing of highways that now carry heavy traffic will also continue to be required.

Although *air transportation* development does not at this time require large development expenditures, it would benefit from administrative reforms.

Coastwise shipping is of considerable importance to Brazil. The principal operating company is now owned by the Brazilian Government. Its fleet of about 100,000 tons is considered too old for further efficient service. Plans have been drawn up for construction of expanded shore facilities which would make possible the building of new vessels in Brazil. If coastwise shipping is to be rehabilitated, such an expansion of facilities is essential. It may also be desirable to purchase foreign-built ships, if available.

Some of Brazil's *ports* require improvements and additional storage facilities. Special requirements will arise in connection with specific developments, as for example in connection with the handling of ore and coal or the refrigeration and packing of fish.

Fuels and Power

No country has ever attained success as an industrial nation without an ample, economical, and dependable source of fuel. At present, wood accounts for over 80 per cent of Brazil's energy consumption, the remainder being provided by domestic and imported coal, by imported petroleum, and by hydro-electric power. Wood is not an efficient fuel and must be brought from increasingly greater distances each year. It is evident that steps must be taken to develop alternative sources of energy.

Brazil's *coal* fields lie at considerable distances from present industrial centers. The quality is poor but could be improved by the use of suitable cleaning equipment. Production amounted to only 2 million tons in 1947; it could be increased—and costs reduced—by increased mechanization at the mines. It is expected, however, that imported coal will continue to be relied on for about half of Brazil's coal requirements.

The consumption of *petroleum* products is likely to be ever-increasing along with—and as a condition of—Brazil's further economic development. Imports in 1948 were about $110 million, of which more than $70 million required payment in dollars. It is evident that Brazil's balance of payments difficulties would be substantially relieved if it were able to satisfy its own petroleum needs.

There are large areas in Brazil where there are promising indications that petroleum exists. Present development programs for transportation and industry assume the continued and increasing availability of petroleum supplies. Yet the resources being devoted to exploration work by the Brazilian Government are far from sufficient—and even under the SALTE Plan they will continue to be inadequate—for an intensive exploration plan. The Report of the (Brazilian) Subcommission on Fuels emphasizes the need for cooperation of foreign capital.

> To conclude only contracts with technicians for their specialized services, to obtain capital merely in the form of loans and to acquire equipment in this and other possible ways, as those who are opposed to cooperation advocate, are not such simple solutions as might appear at first sight. In reality, these proposals would constitute so many additional burdens on the budgets of the Federal Government, already so overburdened, and in view of the high risks involved in petroleum activities, they would simply serve to delay further the solution of this important problem.

There is an obvious need for the further development of Brazil's *hydro-electric power* capacity. The regional distribution of the country's potential power resources is not ideal, but even in areas

where there is at present the greatest market for electric power the potential is generally far in excess of present installed capacity. Existing facilities are deficient as regards not only prospective industrial demands but even existing demands.

The Joint Technical Commission endorses the scale of the program of development proposed in the SALTE Plan, as modified by the Subcommission on Electric Energy. It could not appraise the technical merits of the separate projects covered by the program, but believes that it has in general been well formulated and that it is within Brazil's economic capacity. It would increase the installed hydro-electric capacity over a six-year period from 1.5 million kilowatts to 2.8 million kilowatts.

More than half of the proposed expansion would be carried out by the Brazilian Traction, Light and Power Co., Ltd., and the Cia. Auxiliar de Emprêsas Elétricas Brazileiras (American and Foreign Power Co.). The SALTE Plan is primarily concerned with the remaining 640,000 kilowatts of proposed expansion by private, State and Federally owned enterprises. Successful financing of the power development program will depend on proper adjustment of rate schedules to give reasonable assurance of earning power sufficient to justify the investment. The problem of adjusting rate schedules in a period of rapidly rising costs of labor, materials and equipment is a difficult one, complicated by the fact that the need for a rate increase does not always become fully evident until large-scale expansion is contemplated, when the questions arise of how to pay interest and amortization on the needed funds and of how to attract additional share capital.

Mining

Brazil has considerable deposits of a number of metals and non-metallic minerals. Immense tracts have had no geologic exploration of any kind and it is entirely possible that supplies of certain elements needed in Brazil's developing industries, and now imported (copper, for instance), may be found.

The location of minerals that have a world market and of which Brazil has known supplies far in excess of her potential requirements—high-grade iron ore and manganese are important examples —has thus far proven a serious handicap to their full development.

A considerable expansion of exports of *high-grade iron ore* is now in progress, but the achievement within the near future of a very large further growth, of the magnitude recently suggested, must be regarded as questionable because of the large investments that would be required to construct and equip necessary railway and

port facilities, to provide maritime transport, and to purchase the mining equipment that would be needed; and because of the uncertainty of sustained demand for the ore at a price high enough to justify the investment. However, the possibility that Brazil might enter more fully into the world market for foundry pig iron should not be overlooked.

The *manganese* deposits in the State of Minas Gerais have been extensively worked. Much of the remaining reserves of high-grade ore will be needed for domestic consumption and, in recognition of that need, every effort should be made to develop other manganese deposits for export. At least two such deposits, apparently containing large reserves, exist in locations which make them more suitable for export than for the supplying of domestic requirements.

The development of a domestic source of mineral *phosphate* would be important for Brazilian agriculture. The exploration of phosphate deposits should have high priority in any development program.

Manpower and Public Welfare

Under present conditions, there is full employment in Brazil—in the sense that persons seeking employment can find it. Therefore, the desired acceleration of Brazil's economic evolution will be dependent upon the more effective utilization of current manpower, the improvement of the educational system, the adoption of an appropriate immigration policy, the maintenance of adequate social security services and benefits, and the development of a nation-wide health program.

The more effective utilization of current manpower would be promoted by (1) the improvement of agricultural methods and techniques; (2) the intensification of technical research and training programs; (3) the employment of personnel relations experts in individual factories in a conscious effort to improve employer-employee relationship; (4) the further stimulation of individual effort by the use of improved factory methods, efficient equipment, comfortable installations, and incentive pay for greater productivity; (5) the stabilization of employer-employee relationship through agreements on wages, hours of labor, working conditions, and (6) the maintenance of employment exchange services.

In the field of *education,* the high illiteracy rate in Brazil (43.6 per cent, according to the Census of 1940) and the fact that approximately half of the rural children of school age have available neither school buildings nor teachers present a challenge that must be met before Brazil can begin to realize its productive potentialities.

In recent years, Brazil has increased the emphasis on vocational and technical education. However, because of locational factors and the economic status of the families of many prospective students, the 140 vocational and industrial apprenticeship schools are experiencing difficulty in maintaining their enrollments at capacity. Regardless of the type of organization maintained to provide industrial training, there are certain needs basic to any successful program: (1) an increase in the number and improvement in the quality and training of teachers (too many are drawn directly from industry, with little or no training as teachers); (2) the determining of the occupations for which training is most needed; (3) the development of effective instructional material; (4) the evolution of a guidance program; and (5) the providing of scholarships for both students and teachers showing unusual aptitudes to make possible their advanced training in scientific and administrative fields.

The members of the Joint Commission are in unanimous agreement regarding the necessity of improving agricultural education in Brazil. As much responsibility as possible should be placed upon the State and local government units, because the program will then have a much sounder base.

The importance of *immigration* as a source of manpower for the achievement of Brazil's economic maturity would seem to justify: (1) the liberalization of existing immigration and naturalization legislation, (2) the adoption of an appropriate immigrant selection technique, (3) the consideration of homestead or colonization plans calculated to attract agricultural workers, and (4) the creation of a Central Immigration and Colonization Department, as foreseen in the new Constitution, to coordinate policies and activities in the fields of immigration and naturalization.

Brazil's *social security* legislation may be considered "advanced," regardless of the criteria applied. A thorough examination of the total cost of social insurance and welfare programs, and of whether the returns are fully commensurate with the costs, would make possible periodic appraisals of the laws, the programs and the numerous agencies involved, and might prove to be a valuable guide in the formulation of labor and social welfare policies to the end that neither the well-being of the worker nor the expanding production of the nation will be sacrificed.

Present efforts to improve the administration of laws in the field of labor standards should be intensified. With respect to the "stabilization" law, which requires special indemnification payments to workers discharged after ten years with the same employer, it is

recommended that a study be made to determine whether there are real abuses or inequities that could be eliminated.

The SALTE Plan paints a shocking picture of Brazil's *health* conditions and calls for "an intensive fight to combat the principal diseases which afflict the country."

The larger cities have made substantial health and sanitation progress, but sewage disposal facilities are still inadequate. The rural areas need the greatest attention. The present distribution of sanitation engineers, doctors and nurses between the cities and rural areas is extremely uneven.

The Joint Commission agrees with the authors of the SALTE Plan that the situation calls for immediate and decisive action through such measures as the expansion of health education; the training of doctors, nurses, and public health and sanitation technicians; and the improvement and expansion of present hospital and health center facilities.

Popular support for public health programs has been one of the most encouraging results of the work carried on by the Serviço Especial de Saúde Pública (SESP) in eight large rural areas. Under the Brazil–United States agreement of July 17, 1942, the Institute of Inter-American Affairs undertook, through SESP, to assist the Brazilian Government in several programs of public health and sanitation. The experience and techniques of SESP afford excellent guides for the development of a nation-wide public health program.

PART III

Financing Economic Development

The problem of financing economic development is partly one of financing expenditures in foreign currencies, partly one of securing funds for expenditures which will be made within the country. It will be difficult to withhold from the proceeds of exports enough foreign exchange for the purchase abroad of equipment and essential supplies, to allow rapid progress in the development programs, unless a substantial inflow of foreign capital can be attracted to Brazil. However, the greater part of the programs must be carried out with Brazilian labor and domestic materials, and should, in the main, be financed with domestic funds. Only thus can an excessive future burden on Brazil's balance of payments be avoided.

Financing from Internal Sources

To combine an acceleration in economic development with the greatest possible degree of price stability is not an easy task. It

calls for vigorous action on the part of the Brazilian Government based on courageous and wise decisions. The rate of economic development depends on the willingness of the Brazilian people and Government to redirect the investment of the nation's savings and the expenditure of its tax payments from less productive uses into more productive ones, and on their willingness to limit expenditures on the less essential ones. Plans for financing development must not rely on the creation of credit by the banks, supported by new Government issues of paper money or by Central Bank credit.

Total *tax* revenues of the Federal and State Governments in 1947 amounted to 19.7 billion cruzeiros (U.S. $1,065 million). The proportion spent for developmental purposes might be somewhat augmented, but new methods of increasing revenues must also be found. These should be consistent with Brazilian and international concepts of justice and equality of sacrifice, and should not involve depressing impacts upon industry, agriculture and commerce. Five measures are suggested for consideration by the Federal Government: (1) changes in the method of determining income tax liability for the larger agricultural establishments; (2) application of surtax rates to dividends on bearer shares; (3) increases in excise taxes on certain commodities produced in Brazil, now taxed less than similar imported commodities, and increases on certain imports of relatively low essentiality; (4) increased checking and auditing of taxpayers' returns and records; (5) an increase in the capital gains tax on transfers of urban real property.

There are sizeable parts of a Government development program which can most appropriately be financed through domestic *borrowing*. Federal Government bonds, however, have been quoted at substantial discounts during the last two years, in spite of a balanced budget, a low per capita outstanding debt, and scrupulous maintenance of the debt service on the outstanding issues. The weakness of the market may be explained partly by heavy demands for credit and capital, which may have caused many holders of Government bonds to sell them in order to secure funds which they could not obtain from the banks. The traditional preference of the investing public for real estate was reinforced during the past decade by the continuous rise in the general price level, but the influence of this factor must have been lessened in 1947-48. One of the chief reasons for the weakness of the Government security market seems to be the heavy reliance on forced subscriptions in recent years. The Joint Commission suggests that the present revolving issue of Treasury bills, to which exporters are required to subscribe, be replaced by new issues offered for voluntary subscription. There are

a number of other steps which can be taken to promote a more receptive market for Government obligations. The Brazilian Government's success in placing new issues in the next few years will depend above all on its ability to maintain a fair degree of stability of the price level.

A *redirection of the investment of Brazilian savings* is the only sound basis on which the financing plans for development can be made. Private savings made by individuals and corporations are estimated at about 12 billion cruzeiros (U.S. $650 million) annually, of which almost two-thirds went into building construction in 1947. (Much of this construction was of office buildings and apartment houses in the large cities.) An important component of private savings is the 2 billion cruzeiros of collective savings accomplished through payments to the social security institutes, insurance companies and capitalization companies. The investment policies of these institutions could be modified by laws and regulations setting lower (or new) limits on the percentage of their reserves allowed to be invested in real estate and mortgage loans. Appropriate measures can also be taken to redirect the investment operations of the Federal savings banks, the deposits in which increased by more than 1 billion cruzeiros in 1947.

The establishment of an efficient *Central Bank*—particularly if the responsibility for its policies can be placed in a Monetary Council enjoying the full confidence of the public—would facilitate the formulation and execution of policies designed to stabilize the value of the currency. The Monetary Council could also be given certain responsibilities for guiding the investment policies of other financial institutions as outlined above. Moreover, the Monetary Council and Central Bank could provide more effective supervision of the commercial banking system. One useful measure which might be undertaken would be to limit the interest rates paid by banks to their depositors. Excessive competition among the commercial banks for deposits fulfils no useful economic function. Reduction in the interest rates paid by banks would help to reduce the now excessively high levels of other interest rates, including those on Government securities.

A substantial part of the capital expenditures of Brazilian industry are financed by the ploughing back of undistributed earnings. There are certain basic obstacles to the development of active *markets for private corporation securities* in Brazil, but it is to be expected that the emergence of such markets will be hastened by government policies of keeping the price level relatively stable, of discouraging excessive real estate financing, of taxing capital gains on real estate

more heavily, and of promoting a revival of the market for government securities. Other specific measures to strengthen the private securities markets might include (1) establishment of a body with functions somewhat like those of the United States Securities and Exchange Commission, (2) study and eventual revision of existing company law, (3) removal of certain taxes if it is found that they are interfering with the development of the securities market.

The creation of *private investment banks* might be feasible and desirable when measures have been taken to prevent excessive institutional investment in real estate, when the Government bond market has been reconstructed, and when the basis has been laid for the development of a corporate security market. The formation and operation of investment banks might offer attractive opportunities to enterprising persons, both foreign and Brazilian, who have substantial funds available for investment.

It has been proposed to create certain *semi-governmental specialized banks.* It is of the greatest importance that if such banks are to be established, they should be strongly capitalized and that they should have a continuous source of long-term funds, preferably supplied by the Government from general tax revenues or by the sale of its own direct obligations. They should not engage in ordinary banking business in competition with the commercial banks, nor accept demand deposits in view of the illiquid character of their assets. Nor should they depend upon the Central Bank as a source of funds in view of the inflationary implications of such financing.

Banking bills now under discussion provide for the early transformation of the Agricultural Credit Department of the Bank of Brazil into a specialized *"Rural Bank."* It would be desirable to make this transformation a gradual process, allowing time for adequate capitalization of the Rural Bank, and for the training of additional personnel. At the same time the enlargement and improvement of the existing agricultural extension services of the Federal Government and the States should be pushed forward energetically so that a supervised loan program to small farmers, tenants and sharecroppers along the lines suggested in Part II can be implemented.

The Bank of Brazil, if it were relieved of central banking operations, and if agricultural credit were in the hands of a separate department destined to become an independent institution, might well be expected to furnish *medium-term loans to industry* on a more significant scale than at present. The Bank of Brazil would thus continue its role as a mixed commercial and development bank of great prestige and high achievement.

Financing Foreign Currency Expenditures

Both governmental and private development programs usually involve expenditures abroad for equipment and other essential supplies, and frequently for the services of skilled technicians. The proportions of domestic and foreign expenditures required vary widely between different types of projects, but might average something like two-thirds domestic and one-third foreign. If this estimate is accepted as approximately correct, the importance of expanding and redirecting potential domestic sources of financing is emphasized, but the importance of the problem of obtaining foreign exchange for external expenditures is also apparent.

Brazil's gold holdings are still sizeable, but holdings of hard currencies have been largely depleted; if adequate amounts of gold are to be retained as reserves for contingencies such as a sharp fall in the value of exports, the amounts of funds available from these sources for the financing of a development program must be regarded as limited. Furthermore, even though strong efforts are made to improve the balance of payments, it will be some time before substantial amounts of foreign exchange can be made available from current export proceeds in view of the accumulated trade debt.

Consequently, the assistance of foreign capital is needed to supplement the limited foreign currency availabilities of Brazil in promoting economic development. Without such assistance and the advanced techniques and managerial "know-how" which foreign capital can bring with it, the development of the country will be seriously retarded.

For a number of reasons there can be little hope of floating international loans offered for private subscription within the near future.

While there have been, and still are, certain groups in Brazil who are opposed for ideological or other reasons to direct foreign investments at least in some fields, there is evidence now of a growing appreciation of the need for such investments. A Brazilian Subcommission, in a memorandum on investment policy prepared for the Joint Commission, has taken a definite stand in favor of a liberal attitude toward direct foreign investment. As that report points out, the Constitution of 1946 eliminated most of the discriminatory provisions of the Constitution adopted in 1937 and although it restricted to Brazilians, or to companies organized in Brazil, concessions for the development of minerals and water power, basic rights in which are reserved to the nation, it does not preclude foreign participation in or ownership of Brazilian companies in such fields. The Constitution also includes guarantees against expropria-

tion without adequate compensation. However, as the Subcommission report also points out, not all of the laws which are in conflict with the present Constitution have been repealed, so that an ambiguous situation prevails in some fields which should be clarified by revision of the laws.

There can be no doubt that one of the most effective steps that could be taken to strengthen Brazil's credit standing abroad, and to instill confidence in the minds of potential foreign investors, would be prompt action to end the lag in payments for imports.

In addition, consideration should be given to certain changes in the laws and regulations governing remittances of profits and transfers of capital in order to clarify the treatment that may be expected on foreign investments and thus to offer greater attraction to such investments. In order to obtain the full benefit of the liberal policies that are actually in force, the basic law and the regulations should be widely publicized both in Brazil and abroad, particularly in the United States.

The Brazilian Subcommission on Investments has proposed the principle of granting special inducements to the more essential "favored" investments, either with respect to transferable earnings or with regard to taxation. All such special privileges, if this proposal were implemented by the Brazilian Government, would be incorporated into formal agreements in each case.

It might be desirable for the Brazilian and United States Governments (or agencies of each) to consider the possibility of cooperative arrangements, whereby guarantees might be offered to private investors in the United States assuring them of their ability to effect prompt transfers of their investments from cruzeiros into dollars, should they wish to do so. Such guarantees would probably be availed of only infrequently but their existence, supported by an investment treaty, would offer a psychological inducement of great value in encouraging a greater flow of private capital from the United States to Brazil. They would constitute one means of implementing the policy announced by the President of the United States of fostering capital investment in areas needing development.

In addition, consideration might be given in the United States to reduction of taxation of income derived from investments in those areas as a further means of fostering such investments. This should be supplemented by joint consideration by the Governments of Brazil and the United States of the adoption of a convention designed fully to eliminate double taxation of income and of estates.

The interest of international and national lending agencies in assisting in the economic development of Brazil within the limits

of fair apportionment of their resources is evident from the commitments already undertaken by the International Bank for Reconstruction and Development and the United States Export-Import Bank. It can safely be assumed that the success of further loan applications to these institutions will depend upon the care and realism with which individual projects are planned and the energy with which the Government of Brazil pursues a policy of self-help in promoting the sound financing of the domestic costs of the projects.

Private and Governmental Participation in Development

A broad program for the economic development of Brazil will require cooperation between private interests and Government if it is to be successful. Fields such as manufacturing and mining can be left largely to private initiative and financing, although there is much that Government can do to remove obstacles or to create conditions favorable to an adequate flow of domestic and foreign capital into these fields. There are other fields, such as education and health programs, which will require almost exclusively Government initiative and financing, and still others, such as agriculture, transportation, and electric utilities, in which private and Government initiative will both be required.

In May 1948 the Brazilian Executive Power submitted to the National Congress for consideration *a program of Government development expenditures* to total 17.6 billion cruzeiros (U.S. $950 million) over a five-year period. Present estimates call for a more gradual start in the execution of the SALTE Plan than was originally contemplated. In 1950 a tax program such as that suggested in this report could be expected to provide additional revenue for an expansion of the program, and it should also become possible for the Government once again to secure funds through noninflationary borrowing. Moreover, much could be done through wise organizational reform to reduce the ordinary costs of Government and so provide additional resources for the economic development program.

The SALTE Plan estimates do not cover certain types of Government expenditures, the need for which is shown in Part II of this report, including a great expansion of Federal expenditures for soil conservation, agricultural extension work, and expansion of rural credit.

The sources of funds for some of the *private investments in public utilities,* estimates for which accompanied the SALTE Plan, are still uncertain. Consideration might be given to the creation of a small centralized organization of the "authority" type, provided with a reasonable amount of capital by the Government, which would

undertake to assist the smaller power companies not only in their financing, but also in obtaining expert engineering advice. Alternatively, such companies might find it helpful, both in improving the efficiency of their operations and in dealing with potential lenders, to form syndicates within geographic areas for the organization of management companies and for the mutual guarantee of their obligations.

Industry and mining are the areas into which very sizeable amounts of foreign capital are likely to flow if measures to attract such capital are carried out. This flow, which is not likely to increase at a spectacular rate but can be expected to reach significant proportions, may partly take the form of direct investment by foreign corporations in their Brazilian branches or into their subsidiaries, and partly that of joint Brazilian-foreign undertakings.

In the case of metal mining development the amounts of capital that would have to be invested are sizeable, and the difficulties in concluding contractual arrangements are great. But these difficulties should not be insurmountable if the problem is approached realistically by everyone concerned. Similar considerations apply to petroleum whose speedy exploration is so important to Brazil's further economic development.

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