

Corporate
File

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

1946



THIRTY-FOURTH ANNUAL REPORT
FOR THE YEAR ENDED DECEMBER 31ST 1946





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BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

(Incorporated under the Laws of the Dominion of Canada)

Principal Operating Subsidiaries

THE RIO DE JANEIRO TRAMWAY, LIGHT & POWER COMPANY, LIMITED
THE SÃO PAULO TRAMWAY, LIGHT & POWER COMPANY, LIMITED
BRAZILIAN TELEPHONE COMPANY
BRAZILIAN HYDRO ELECTRIC COMPANY, LIMITED
SÃO PAULO ELECTRIC COMPANY, LIMITED
THE SAN PAULO GAS COMPANY, LIMITED
THE CITY OF SANTOS IMPROVEMENTS COMPANY, LIMITED
SOCIÉTÉ ANONYME DU GAZ DE RIO DE JANEIRO
COMPANHIA FERRO CARRIL DO JARDIM BOTANICO

Board of Directors

HENRY BORDEN, C.M.G., K.C., *President*
E. C. FOX, *Vice-President*

JOHN DAVIDSON
JAMES A. ECCLES
WALTER GOW, K.C.
RIGHT HON. THE VISCOUNT GREENWOOD, P.C.
A. P. HOLT
S. H. LOGAN

C. D. MAGEE
BEVERLEY MATTHEWS, C.B.E., K.C.
W. E. PHILLIPS, C.B.E., D.S.O., M.C.
H. B. STYLE
G. R. F. TROOP, C.A.
NORMAN D. WILSON

Secretary
D. H. CROMAR

Treasurer
G. R. F. TROOP, C.A.

Assistants to the President

F. A. SCHULMAN C. H. N. ASHLIN

Principal Bankers

THE CANADIAN BANK OF COMMERCE

General Solicitors

BLAKE, ANGLIN, OSLER AND CASSELS, TORONTO

Auditors

CLARKSON, GORDON & Co., TORONTO

Offices

HEAD OFFICE - - - - - 25 King Street West, Toronto 1, Canada
LONDON AGENTS - - - - - Canadian & General Finance Co., Limited
147-B, Leadenhall Street, London, E.C.3,
England

F O R E W O R D

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED is a Canadian corporation which through its Operating Companies has for upwards of 35 years been supplying electric energy, gas and tramway service in the highly industrialized and progressive states of Rio de Janeiro and São Paulo and in the Federal District of Rio de Janeiro as well as telephone service in these centres and in the state of Minas Geraes. These three states and the Federal District, situated in South-eastern Brazil, comprise an area of 342,000 square miles and have a population of approximately 20 millions. Included in this area are the cities of Rio de Janeiro, the capital city of Brazil, with a population of nearly 2 millions, São Paulo, the largest and most rapidly growing industrial centre in South America, with a population of over 1½ million, and Santos, one of Brazil's most important seaports.

Through its Operating Companies, Brazilian Traction, Light and Power Company, Limited produces and distributes over 60% of the total power produced in Brazil and supplies approximately 75% of the telephones in service in that country.

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

THIRTY-FOURTH ANNUAL REPORT

TO THE SHAREHOLDERS:

Your directors submit herewith the following report on the Company's affairs, together with the audited accounts for the year 1946, including the consolidated balance sheet of the Company and its operating subsidiary companies in Brazil as at 31st December, 1946. All figures in the report expressed in dollars are in United States currency unless otherwise indicated.

As may be seen from the information contained herein, the year 1946 has witnessed a further growth in the business of the Company.

COMPARATIVE STATEMENT OF EARNINGS 1943-1946

The following statement shows the combined earnings and charges of the operating companies and of Brazilian Traction for the past four years, excluding inter-company items.

	Year ended 31st December			
	1943	1944	1945	1946
Gross earnings from operations	\$52,162,244	\$58,342,514	\$65,150,899	\$78,253,700
Interest on temporary investments	711,390	690,306	807,746	689,508
Other miscellaneous income	392,156	140,381	221,733	117,673
Total Revenue	\$53,265,790	\$59,173,201	\$66,180,378	\$79,060,881
<i>Less:</i> Operating expenses including provision for taxes	\$24,371,486	\$27,785,992	\$35,219,518	\$47,079,254
Depreciation	6,484,567	6,227,040	5,528,381	5,490,531
Amortization	1,000,000	1,000,000	1,000,000	1,000,000
Total Operating expenses, depreciation and amortization	\$31,856,053	\$35,013,032	\$41,747,899	\$53,569,785
Net Revenue before capital charges	\$21,409,737	\$24,160,169	\$24,432,479	\$25,491,096
<i>Less:</i> Bond interest	\$ 1,511,927	\$ 1,483,700	\$ 1,455,845	\$ 1,464,359
Sinking funds and other financial charges	745,598	742,251	764,118	925,256
Total Capital charges	\$ 2,257,525	\$ 2,225,951	\$ 2,219,963	\$ 2,389,615
Net Revenue for the year	\$19,152,212	\$21,934,218	\$22,212,516	\$23,101,481

Increase in gross earnings from operations for 1946 over 1945 amounted to 20.11% as compared with 11.67% for 1945 over 1944. This was due to a combination of increased sales, increased tariffs for a full year and improved exchange rates.

Operating expenses for 1946 were 33.67% over 1945 as compared with 26.75% for 1945 over 1944. This increase was entirely due to rising labour and material costs. The following

tabulation of percentage of total Operating Expenses, before depreciation and amortization, to Gross Earnings from Operations, clearly indicates the rising trend in this regard over the past four years:

1943	1944	1945	1946
46.72%	47.63%	54.06%	60.16%

CAPITAL EXPENDITURE

The cash expenditure on capital account by the operating companies during the past four years is as follows:

1943	1944	1945	1946
\$13,773,168	\$11,944,742	\$19,439,456	\$34,069,204

At the last annual meeting of the Company the Chairman advised shareholders that the capital expenditure budget for 1946 was approximately \$30,000,000 and that large capital expenditures must be anticipated in future years, having regard to the heavy demand for our services. The reasons which justified the statements on this subject at that time still exist and the Company has now commenced a capital expenditure program designed over the next five years, to bring the facilities into line with the demand for them and to put the Company in a position to maintain the efficiency of its services. The estimated cost of this program is approximately \$160,000,000. Due to world conditions it is impossible to forecast far into the future and for this reason the program is designed on a flexible basis. As and when it becomes feasible to arrange the financing of a part of this program by the issuance of funded obligations it is the intention of your directors to follow this course. The budget for capital expenditure in 1947 in accordance with this program is \$40,000,000.

BRAZILIAN EXCHANGE—1946

The year 1946 brought several modifications in exchange regulations and an improvement in the value of the cruzeiro in terms of the dollar.

Early in the year the "Special Free Market" used for general remittances authorized by the Bank of Brazil was abolished and from then onwards these remittances were transacted on the "Free Market", where purchases had hitherto been limited to payment for imports. At the same time the 5% tax on remittances payable by the purchaser of exchange was abolished and in its place a "quota" of 3% was imposed by including this amount in the exchange rates quoted by banks. This quota, however, was abolished on July 26th, 1946.

The Decree-Law which abolished the "Special Free Market" imposed certain restrictions on the repatriation of capital and remittances of interest, dividends and profits. These restrictions, however, were temporarily suspended in August, 1946, and the suspension is still in effect.

Since the abolition of the "Special Free Market", general remittances and remittances in payment of imports have been made at the one rate.

The cruzeiro at closing sight rates of exchange on New York and London on the 31st days of December in 1945 and 1946 stood as follows:

	1945*	1946
Free Market - - - - -	5.13 cents	5.34 cents
Free Market (Sterling area) - - - - -	3-11/256d	3-23/128d
Special Free Market - - - - -	5 cents	
Special Free Market (Sterling area) - - - - -	3-11/256d	

*The five per cent tax on remittances which was in force at the end of 1945 is excluded from the rates quoted above.

The current assets and liabilities of the operating companies in Brazil were valued at the end of the year in dollars at the closing sight rate on the "Free Market" for exchange on New York.

The combined earnings of the operating companies, expressed in dollars, which are published monthly and which also appear in total in the tabulated statement on page 4 of this report, are calculated at the remittance rate, or at the rate at which remittances could have been effected, for the month in which the earnings were made. Due provision was made for the remittance tax up to the time of its abolition.

DIVIDENDS PAID

In addition to the usual quarterly dividends on the small outstanding balance of the preference shares, two dividends were paid during the year on the ordinary shares of the Company, viz: \$1.00 on June 20th and \$1.00 on December 2nd (Canadian funds).

WAGE RATES AND TARIFFS

In spite of the substantial general increases in wages made in May and September 1945, agitation continued throughout the first six months of 1946 for a further general wage increase to meet the rising cost of living. After prolonged negotiations in which the Minister of Labour and a special commission appointed by Congress took part, and after an abortive strike on the night of May 31st, Decree-Law 9,411 of June 28th, 1946, was promulgated. This Decree-Law provided for a general increase in wages ranging from 20% to 28% for wages up to Cr\$1,000,00 per month and an increase of Cr\$200,00 per month on all wages above this figure. These increases became effective on June 1st, 1946. The Decree-Law also provided for the appointment of a special commission to examine the contention of the operating companies that the 10% increase in electricity, gas, telephone and water rates and the 10 centavos, (Cr\$0,10) in tramway fares granted under Decree-Law 7,524 of May 5th, 1945, had been insufficient to cover the wage increases already given, and that the new burden amounting to approximately \$5,830,000 per annum would require a further increase in electricity, gas, telephone, and water rates and in tramway fares. The Decree-Law stipulated that if the findings of the commission were to this effect, then such increases as the commission might find, from an examination of the accounts, to be the indispensable minimum to meet the new wage increases, would take effect as from January 1st, 1947. The operating companies were thus required to bear the additional burden of the new wage rates for the last seven months of 1946 without any corresponding tariff increase.

The commission's report substantiated the contention that there had been no balance available from the previous tariff adjustment and found that a 6.2% increase in electricity, gas, telephone and water rates and an average of 3.55 centavos (Cr\$0,0355) in tramway fares was justified. Presidential Decree No. 22,260 of December 12th, 1946, confirmed these findings and authorized the Companies to incorporate these increases, as well as the May 1945 increases, in their basic tariffs as from January 1st, 1947.

Apart from these general increases, wage adjustments for merit and length of service were also granted, equivalent in a full year to an additional \$1,810,000.

Official cost of living indices at the end of 1946 showed an increase over December, 1939, of 196.5% for hourly paid workers and 152.6% for salaried workers. That wages paid by the operating companies have been increased during this period to an extent commensurate with the increased cost of living is shown by the fact that the average wage paid to all classes at the end of 1946 was 195% over the average wage paid in December, 1939.

At the end of the year the operating companies voluntarily paid to each employee a Christmas bonus varying between a maximum of 16 days' pay and a minimum of 8 days' pay according to the employee's record of attendance.

The Constitution of the United States of Brazil promulgated on September 18th, 1946, provides for "obligatory and direct participation of the worker in the profits of the concern in the terms and form that the law may determine" and also for a "weekly remunerated day of rest, preferably on Sundays; and, the technical requirements of the concern permitting, on civil and religious holidays in accordance with local traditions". It is expected that legislation to implement these two provisions of the Constitution will be enacted during 1947. It is not possible to anticipate the principles on which participation of the workers in profits will be based but it is hoped that whatever form it may take, participation will only become effective on profits in excess of a fair return on capital which in the case of public utilities is specifically provided for under the Constitution.

With regard to provision for a weekly remunerated day of rest, it is expected that this will entail an increase in the payroll of the operating companies of approximately \$6,000,000 per annum. It is impossible to make any forecast as to the date when this proposed legislation may become effective.

The future trend of wage levels must depend upon the result of the Government's expressed intention to reduce or at least stabilize the cost of living. If the cost of living can be stabilized at the December, 1946, levels, with wages already increased to meet these levels and with the addition of the constitutional provisions for a remunerated weekly day of rest, the real value of the workers' pay measured in terms of purchasing power and consequently his standard of living will be materially improved in comparison with 1939. Only by calling a halt now to the vicious spiral of increased wage levels and increased cost of living can the lot of the worker be improved. It would appear that this fact is apparent to the authorities and is now becoming evident to a large proportion of the workers themselves.

In spite of a year of general labour unrest, relations between management and union leaders and the majority of employees remained cordial. For the most part, such dissatisfaction as was expressed was directed against the general conditions above referred to rather than against the Companies, which are as much the victims of these circumstances as are the employees.

ELECTRIC POWER SUPPLY

The rate of load growth during the year continued high. The maximum demand on the Rio system reached 231,610 kW, an increase of 17,400 kW or 8.12% over 1945, while on the São Paulo system the maximum demand reached 384,226 kW, an increase of 41,476 kW or 12.1% over 1945. The increases in kWh generated were 4.28% and 13.6% on the Rio and São Paulo systems respectively.

On the Rio system the load was carried with a small margin of generating capacity, although by drawing in excess of firm capacity on the water storage.

The demand experienced on the São Paulo system was greater than the generating capacity of the plants and during periods of peak load could only be carried with subnormal voltage and frequency. For this reason, in agreement with the authorities, new connections for heating load in São Paulo were prohibited.

River flows in 1946 in general continued appreciably below average. In the Rio area, while it has not been necessary to return to rationing, this possibility will not disappear until after the Paraíba-Piraí diversion becomes effective.

In the São Paulo area the accumulated storage in the Rio Grande and other reservoirs was sufficient to carry the electric energy demands during 1946, and it is estimated that it will be sufficient to meet the 1947 demands. Diversion of water from the Tieté river by pumping to the Rio Grande to increase the water supply for the Serra plant will begin in large quantities when the second Pedreira pump is completed and operating at the end of 1947. This diversion should permit the filling of the Rio Grande as well as other reservoirs, and provide the necessary water supply to meet the growing load demands of the São Paulo system for a number of years.

During the year there were three cases of broken or cracked buckets on one wheel of generator No. 7 at the Serra do Cubatão plant. This caused interruptions which put the machine entirely out of service for 126 hours (a loss of 65,000 kW) and kept it operating at half capacity for a further 473 hours. During this time some load had to be dropped even though the small São Paulo reserve steam plant was operating. As only two buckets were held as spares, three new buckets weighing over half a ton each were flown from Geneva to London and thence to Brazil; the whole journey taking less than three days.

Appreciable work was carried out during 1946 on the distribution systems of both Rio and São Paulo. The most important improvements in Rio were the replacement of a 3,000 kVA bank of transformers at the Penha substation by a 15,000 kVA bank and the installation of a 25,000 volt substation at Caxias with an initial capacity of 2,000 kVA.

On the São Paulo system 16,335 kVAR of static condensers were installed to improve voltage conditions and increase the utilisation of the 3,800 volt feeders and a further 21,750 kVAR of static condensers were installed in the various substations to improve the general conditions of the system.

Work on the electrification of the Sorocabana Railway continued. The main line has been double-tracked from São Paulo for nearly 90 miles and is in operation as far as Santo Antonio. The intention is to electrify this railway as far as Bernardino de Campos, 280 miles from São Paulo.

Some progress has also been made with the work of electrification of the Cia. de Estrada de Ferro Santos—Jundiá, formerly the British-owned São Paulo Railway Company, which was taken over by the Brazilian Government at the expiration of the concession. According to present estimates it is expected that this railway will be electrified from Moóca to Jundiá by June, 1948.

In the Rio district, the Estrada de Ferro Central do Brasil continued the progressive electrification of some of its lines and intensified the traffic over the electrified parts of its system.

HYDRO-ELECTRIC DEVELOPMENT

Rio System—At Ribeirão das Lages, tunnel No. 1 was completed in July and after very satisfactory tests, went into service in August, adding 18,000 kW to the firm power capacity of the Lages plant. The installation of Lages unit "C" of 47,000 HP nominal capacity, referred to in last year's report as going into service at the end of 1946, was delayed owing to manufacturing difficulties, but went into service in February, 1947. An additional unit "D" similar in all respects to "C" was ordered for this plant during the year and is expected to be ready for service in 1949.

Work on the Paraíba-Piraí diversion project was limited during the year to the construction of roads, shops and housing facilities. Active work on the tunnels, dams and pumping installations was commenced early in 1947. When the different phases of this project

are completed, it will be possible to pump 40 metric tons of water per second from the Paraíba river to the Lages power plant and ultimately this rate can be increased to 160 metric tons per second when additional pumping units are installed.

An additional unit, No. 5, with a rated capacity of 65,000 hp , was ordered early in 1946 for the Ilha dos Pombos generating plant.

São Paulo System—At the Serra do Cubatão plant, work on the building extension to house Nos. 4 and 6 units was well advanced at the end of the year and the erection of unit No. 4 was 80% completed. This unit, scheduled to come into service in April, 1947, will add another 91,000 hp to the generating capacity of the plant. Two similar units, Nos. 6 and 8 have already been ordered and it is expected that they will be operating early in 1948 and 1949 respectively. The Serra tunnel and surge tank "C", started in January, 1946, which will provide for the future additional units, were well advanced at the end of the year.

Some progress was made with the work of rectification of the Pinheiros, Grande and Guarapiranga rivers, which will provide additional water for the Serra plant. Excavation in the lower Pinheiros was commenced in August and 179,000 cubic metres of material was removed. This work should be completed in 1947. With the installation of the second Pedreira pump, expected to be in operation in November, 1947, the Serra plant at the present rate of load growth should be assured a sufficient water supply until 1951.

Serra-Lages Transmission Line—Work on this line was actively proceeded with, the erection of the towers being 75% completed at the end of the year. The date of completion of the whole line, however, has had to be advanced to July, 1947 owing to delays in the arrival of materials and to a change of location rendered necessary because of a government project to build an aviation field in the vicinity of the original right of way. During the year a 50,000 kW frequency changer was ordered for installation at Guaratinguetá on this 230,000 volt transmission. This frequency changer is intended to tie in the 50 cycle Rio system with the 60 cycle São Paulo system, thus making possible the interchange of power between the two and the obtaining of other advantages from interconnection.

TELEPHONE SERVICE

While there has been some improvement over the abnormal conditions which existed during the war years, it is still extremely difficult to obtain telephone equipment from abroad, and as a result the Company has had to continue to limit the work of expansion to the material available. However, considerable work of a preparatory nature has been carried out in connection with an extensive program planned to meet the demand for telephone services throughout the toll and urban systems. Although 13,400 additional lines were installed during the year, the number of prospective subscribers awaiting connections continued to increase, reaching 100,000 at the end of the year. Everything possible is being done to meet this situation. Contracts have been placed wherever satisfactory material can be obtained, and there are now on order in England, the United States, Belgium and Sweden, 100,000 lines together with the necessary exchange equipment. In spite of all the Company's efforts to ameliorate this unsatisfactory situation it is not expected that more than 20,000 lines can be added to the system in 1947 and another 60,000 lines in 1948.

Increases were obtained during the year for exchange service rates and toll rates in the state of Rio de Janeiro and for local service rates in the state of Minas Geraes. In the state of São Paulo all telephone companies with lines extending to two or more municipalities were authorized to increase their tariffs and on June 1st, 1946 the new rates were put into effect.

GAS SERVICE

Due to the continued difficulties in obtaining coal shipments from abroad, the rationing and restrictions regarding new gas connections were maintained on the same basis as in 1945. Nevertheless, the combined gas output in the cities of Rio de Janeiro, São Paulo and Santos showed an increase of 9.14% over the year 1945.

The shortage of Brazilian coal resulting from the greater demand further reduced the amount available for our Companies so that during the year only 17.4% of the total tonnage carbonized was national coal.

The number of consumers connected during the year increased by 3,638 or 2.04% and the average daily consumption per consumer showed an increase of 5.86% over 1945.

TRANSPORTATION

The decrease of 6.21% in the recorded total number of passengers carried was due primarily to the modification of the zones in the city of Rio de Janeiro made in October 1945. This is evidenced by the fact that for the months of November and December when the zoning conditions in that city for both years were the same, there was an increase in 1946 of 2.48% compared with 1945. A small decrease recorded in the number of passengers carried in São Paulo may be attributed principally to the greater number of competing buses and private automobiles in service.

The proposed merger of the tramways and bus companies operating in the Federal District was mentioned in last year's report. During the year a new commission was appointed by the Municipal authorities to continue the study of this transportation problem and this commission is still pursuing its enquiries. The necessity for arriving at a solution of the critical transport problem in the city of Rio de Janeiro becomes daily more urgent.

Negotiations with the São Paulo Municipal authorities were continued throughout the year on the subject of the future of the tramway service, the concession for which expired in July 1941. As a result of these negotiations a new national transportation company, of which the Municipality of São Paulo is the majority shareholder, has been formed to purchase and operate the tramway and bus services in the city and to co-ordinate and improve the existing transportation facilities. The purchase agreement with your Company was concluded on March 14th, 1947. Under the terms of this agreement your Company will continue to operate the tramways for a maximum of 120 days from that date.

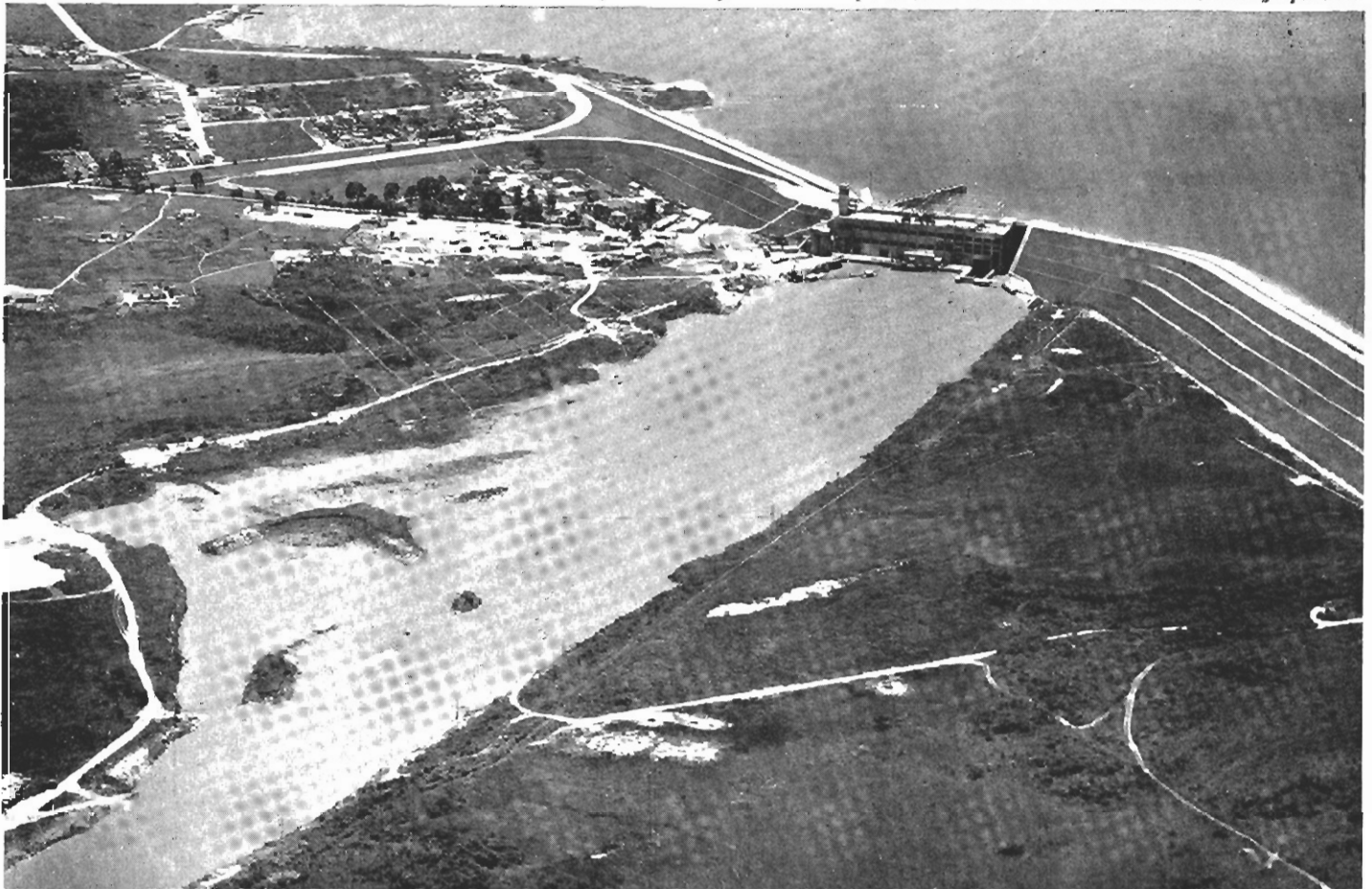
COMPANY SCHOOLS

For many years some of the operating Companies in Brazil conducted on their own initiative technical classes and educational schools for the benefit of employees. In 1942 legislation was passed making it compulsory for such educational facilities to be provided and the matter came under government jurisdiction. The authorities, however, allowed us to continue to operate our own schools independently under official supervision, provided we contributed to the National Service of Industrial Instruction. Much interest has been shown in this educational scheme and as a result, classes have been organized covering a variety of subjects aimed at training our personnel along lines best suited for our services. In addition, instruction of a general nature is given to minors and adults. Nearly all the teachers are recruited from among the experienced technicians on our staff and the results have been highly satisfactory.



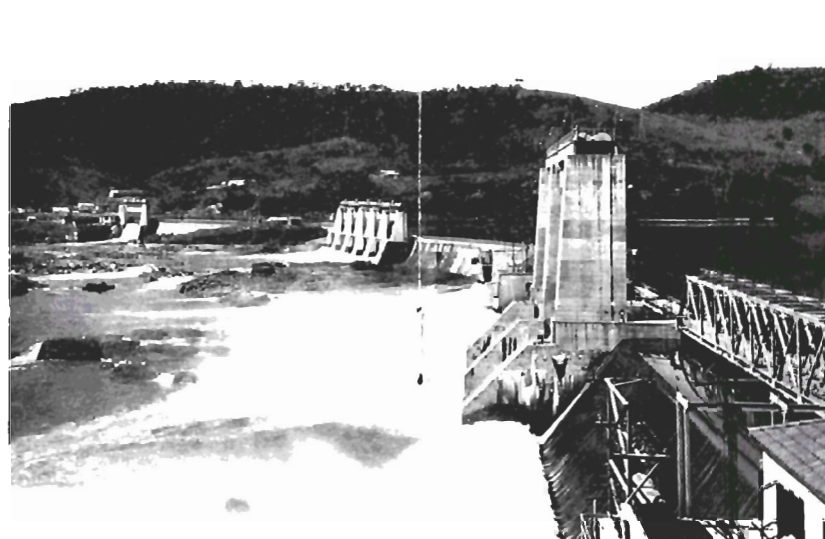
View taken from the top of the Serra plateau looking towards the ocean and showing the Cubatão Powerhouse 2,400 feet below.

Serra Development showing Pedreira Pumphouse, Rio Grande Dam and Reservoir, looking upstream.





Serra da Cabanão Hydro electric Plant showing Penstocks and Powerhouse - Static Head 1,118 feet alt. near



Ilha dos Pombos Hydro-electric Plant showing the main Dam, Sluiceway Gates and Sector Gates.

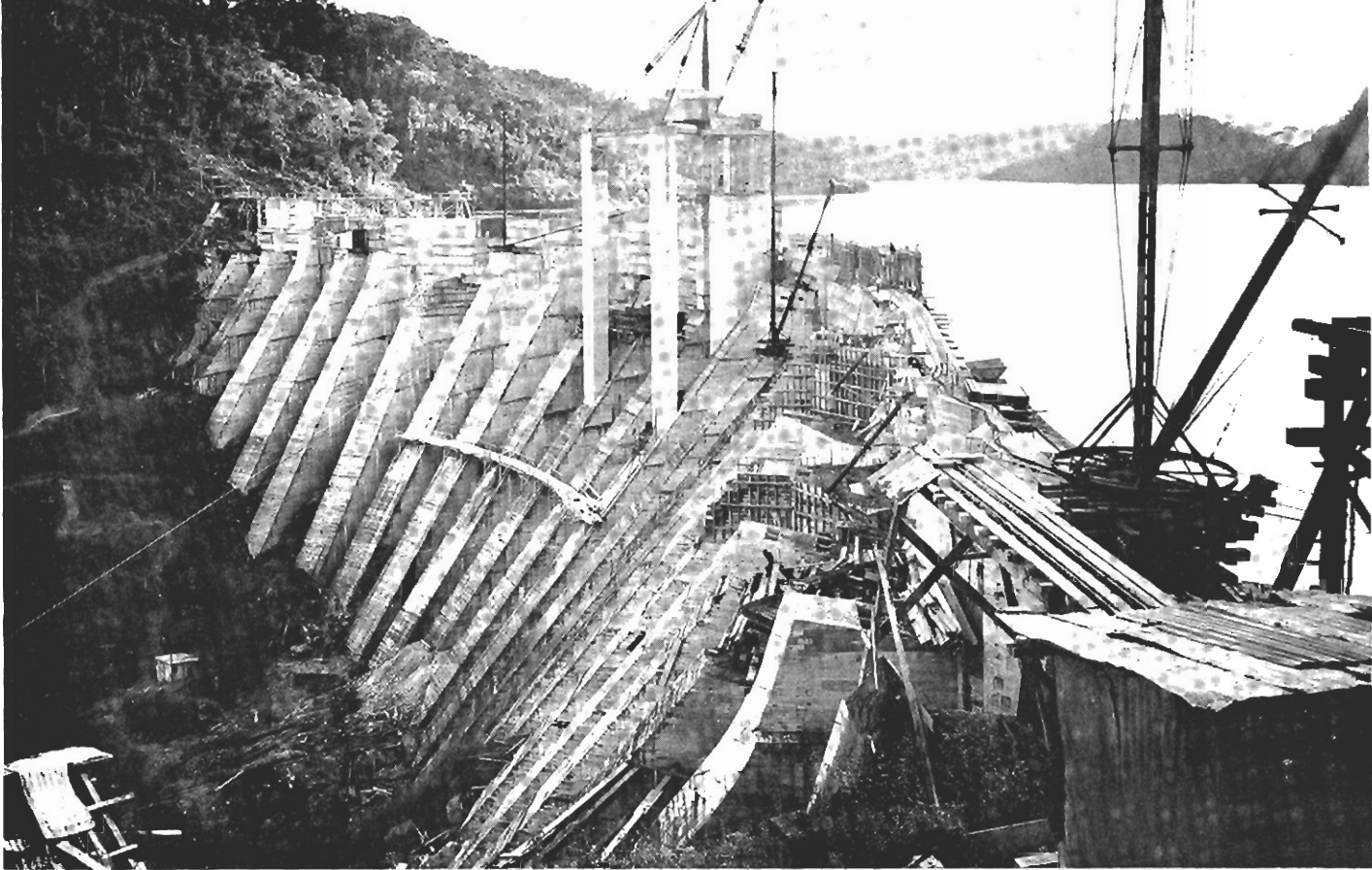


Ribeirão das Lage Hydro electric Plant showing Valanches, Penstocks and Powerhouse - Static Head 1,118 feet alt. near

HYDRO-ELECTRIC DEVELOPMENTS OF OPERATING COMPANIES

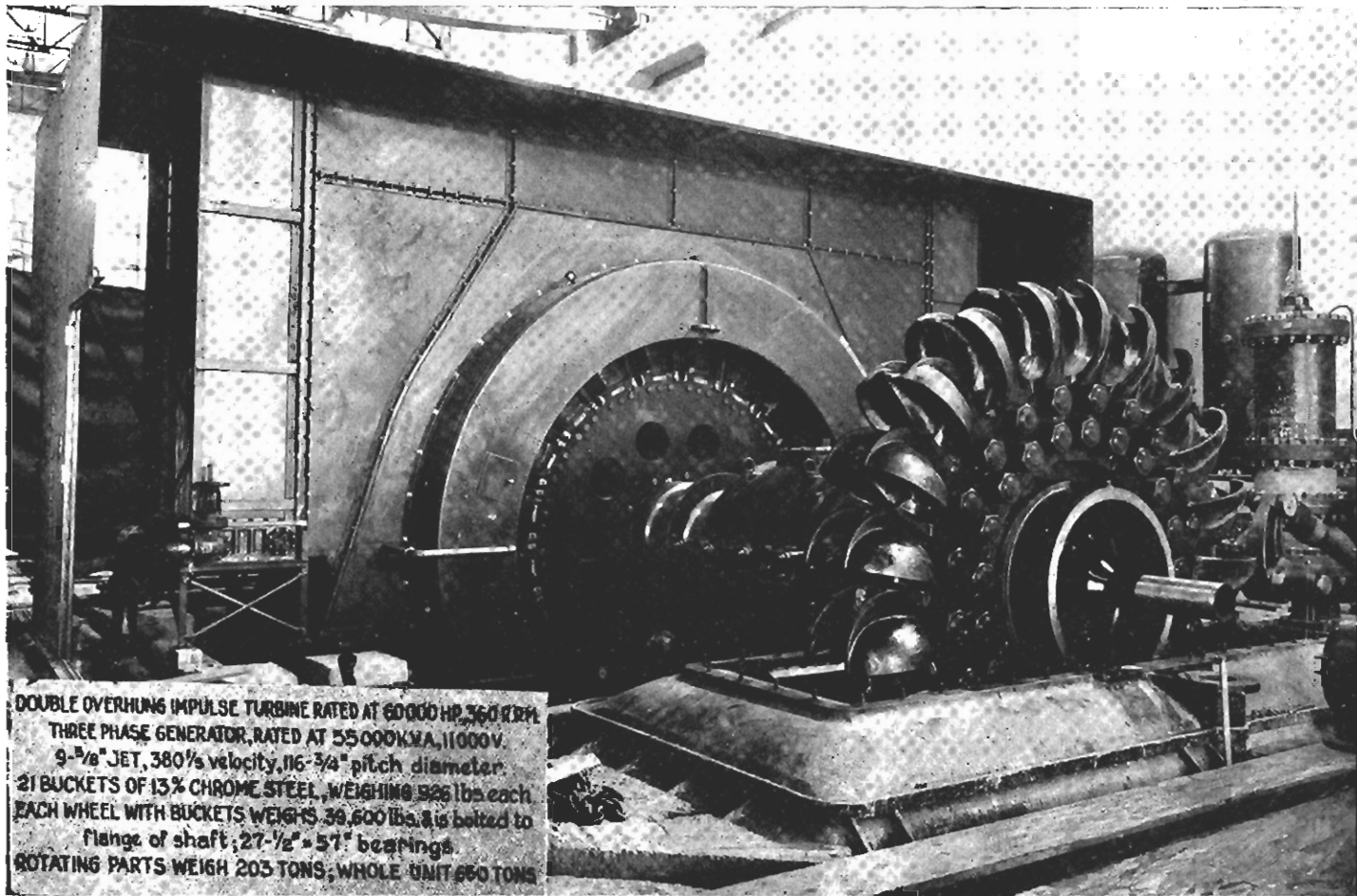


SKETCH
INDICATING THE
PRINCIPAL HYDRO-ELECTRIC PLANTS
OF THE
OPERATING COMPANIES
SHOWING ONLY THE
RESERVOIRS, RIVERS AND MAIN
TRANSMISSION LINES
1942



Ribeirão das Lages Dam 1946.

Serra do Cubatão Hydro-electric Plant, Generating Unit No. 3.



DOUBLE OVERHUNG IMPULSE TURBINE RATED AT 60000 HP, 360 RPM
THREE PHASE GENERATOR, RATED AT 55000 KVA, 11000 V
9-³/₈" JET, 380 1/2 velocity, 116-³/₄" pitch diameter.
21 BUCKETS OF 13% CHROME STEEL, WEIGHING 526 lbs each
EACH WHEEL WITH BUCKETS WEIGHS 39,600 lbs. & is bolted to
flange of shaft; 27-¹/₂" x 57" bearings.
ROTATING PARTS WEIGH 203 TONS; WHOLE UNIT 660 TONS

INDUSTRIAL DEVELOPMENT AND FOREIGN TRADE OF BRAZIL

The steel mills of the important government sponsored plant of the Companhia Siderurgica Nacional, at Volta Redonda, were officially opened on October 12th in the presence of the President of the Republic and other high government officials. The plant is not yet ready to produce to capacity (estimated at 340,000 tons per annum) but with the sections now operating, considerable quantities of pig iron and steel are being produced as well as rails from the rolling mills. A separate high tension transmission line connects the plant to our Rio system.

Power sales for industrial purposes in the Rio and São Paulo districts continued to grow. There was an increase in the combined systems of 3.8% in 1946 compared with 1945.

Industries which showed the greatest development were:

	% of 1946 total power sales	Increase in power consumption over 1945
Tires and Rubber Goods	2.7%	18.8%
Electrical Materials	1.9%	15.6%
Cold Storage	2.3%	15.2%
Machine Shops and Metal Works	6.6%	14.1%
Railway Electrification	14.1%	11.5%
Building Loads	4.0%	8.9%
Silk Mills	6.6%	6.8%

Flour mills which in 1946 consumed 2.2% of the total power sold in the Rio and São Paulo districts showed a decrease of 43.3% for the year, compared with 1945; this was due to the shortage of wheat.

Requests for immediate new connections and increases in both the Rio and São Paulo districts represent an additional demand of over 35,000 kw, this excludes the heavy demands in São Paulo for domestic heating estimated at 15,000 kw, which for reasons stated elsewhere in this report cannot as yet be met.

During 1946 the operating companies purchased materials either manufactured or produced in Brazil to a total of Cr\$210,000,000 or \$10,500,000. These purchases comprise a great variety of goods of which the most important, in terms of dollar value, were:

Copper fabricated goods - - - -	\$2,427,000	Cement - - - - -	\$400,900
Steel and iron - - - - -	1,460,000	Office supplies - - - - -	386,000
Electrical appliances - - - - -	904,000	Cotton goods - - - - -	344,900
Lumber - - - - -	880,000	Rubber goods - - - - -	310,453
Fuels—coal, charcoal - - - - -	670,000	Clay products—bricks and	
Foodstuffs - - - - -	504,000	pipes - - - - -	232,600
Telephone apparatus and appliances	488,000	Furniture - - - - -	200,000

The international trade of Brazil is indicated by the following table showing the exports, imports and balance of trade for the years 1942 to 1946 inclusive:

	1942	1943	1944	1945	1946
			(thousands of cruzeiros)		
Exports - - - - -	7,499,556	8,728,569	10,726,509	12,197,510	18,242,734
Imports - - - - -	4,644,348	6,161,741	7,965,141	8,617,320	13,028,716
Balance of Trade - -	2,855,208	2,566,828	2,761,368	3,580,190	5,214,018

NOTE: 1,000 Cruzeiros are equivalent to approximately \$53.00 at present rate of exchange.

The 1945 favourable balance of trade, which established a record in Brazil's economic history, was exceeded in 1946 by 45.63%; the favourable trade balance for the year amounting to more than \$260,000,000.

The principal exports in 1946, both in value and volume, were coffee, which continued to hold first place, and raw cotton. These two products represented 51.41% of the total value of exports for the year.

Coffee shipments in 1946 were 15,504,581 bags, exceeding shipments in 1945 by 9.4%. Shipments to Europe continued to increase, being over double the amount shipped in 1945. The value of coffee exported was Cr\$6.441.463.000 compared with Cr\$4.260.340.000 in 1945, an increase of 51.2%. This large increase was principally due to the sharp rise (37%) in the price of coffee in 1946 over 1945.

The congested conditions in the ports of Rio de Janeiro and Santos continue to be a source of serious concern and there seems to be little prospect of any immediate improvement. A number of factors have contributed to these conditions, the chief of which are the unsettled labour situation generally, which has slowed down the handling and distribution of goods, and the shortage of material for the maintenance of the existing overworked dock equipment. In Santos there is the added difficulty of insufficient railway wagons for inland transport. In both ports the situation has been aggravated by the record movement of goods handled.

POLITICAL

The new Brazilian Constitution, to which reference was made last year, was duly drafted and voted by the Constituent Assembly and was promulgated on September 18th, 1946.

Generally speaking, this Constitution is democratic and conservative in character and affords guarantees in respect of property rights and sanctity of contracts, in addition to providing for a fair return on capital employed by public utility companies. Certain provisions regarding the rights of labour, previously referred to, require further legislative enactments.

The Constituent Assembly has been divided into its two inherent groups, namely, Chamber of Deputies and Senate, which are now functioning normally as legislative bodies.

The September Constitution provided for general elections in each state of the Federation for the selection of Governors and representatives to the State Legislative Assemblies. These elections took place in January, 1947.

MR. H. MALCOLM HUBBARD

It is with deep regret that we record the death of Mr. H. Malcolm Hubbard in England on December 22nd. Mr. Hubbard had been associated with the Company, of which he was a Vice-President, since its inception and very ably administered the Company's affairs in the United Kingdom and Europe from the offices in London. His was a long life of outstanding service and the loss to the Board of his wise counsel and wide experience will be greatly felt.

CHANGES IN THE BOARD

Immediately following the Annual Meeting in June, 1946, Mr. A. W. K. Billings, for reasons of health, resigned as President of the Company and your directors elected Mr. Henry Borden, K.C., to succeed him. On January 7th, 1947, Mr. Billings, The Right Hon.

Sir Thomas White and Mr. S. G. Crowell, K.C., resigned as directors and Mr. W. E. Phillips, Mr. Beverley Matthews, K.C., and Mr. H. B. Style were appointed in their stead.

Your directors wish to place on record their high appreciation of the work which Mr. Billings carried on over a period of more than twenty-five years. In addition to being in a very special sense the creator of the Company's great hydro-electric system, his experience, knowledge and faith in Brazil rendered his counsel, not only on technical problems, but on all matters relating to the Company's policy, of incalculable value. While Mr. Billings has thus laid down his responsibilities after a lifetime of strenuous and fruitful service in many parts of the world, it is a matter of great satisfaction to your directors that his interest in the affairs of the Company continues.

Your directors announce that, due to impairment of health, they regretfully accepted the resignation of The Right Honourable Sir Thomas White whose long association with the Company goes back to the year 1920. The unfailing interest he at all times manifested in the Company's undertakings, his wise counsel backed by his great experience and knowledge of business and public affairs, were always unreservedly placed at the disposal of the Company and will be greatly missed by your directors.

Mr. S. G. Crowell, K.C., who was associated with the Company in various capacities over many years also resigned as a director of the Company for reasons of health and the Board wish to take this opportunity to record their appreciation of his services.

STAFF

Your directors record the Company's appreciation of the loyalty and enterprise of the staffs and the efficient service they have rendered in Brazil and elsewhere throughout a difficult year.

For the Board of Directors,

HENRY BORDEN,

President.

TORONTO,
13th MAY, 1947.

BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED

AND ITS PRINCIPAL SUBSIDIARY COMPANIES
COMPARATIVE CONSOLIDATED BALANCE SHEET

AS AT 31ST DECEMBER 1946 AND 1945
(Expressed in terms of United States currency)

ASSETS	31st December	
	1946	1945
Plant, Property and Equipment at cost -	\$358,074,300	\$327,314,912
Investments in and Advances to Subsidiaries not consolidated:		
Investments in securities at cost -	14,259,381	14,293,811
Advances -	18,400,680	17,807,355
	\$390,734,361	\$359,416,078
 Prepaid Expenses and Sundry Assets:		
Sundry prepaid expenses, deferred charges, etc. -	\$ 1,179,576	\$ 1,218,231
Guarantee deposits and sundry assets -	306,873	327,080
Cash on deposit with trustee for sinking fund -	96,711	88,077
	\$ 1,583,160	\$ 1,633,388
 Current Assets:		
Cash (including Brazilian currency) in banks and on hand -	\$ 27,018,813	\$ 28,670,187
Temporary investments in securities of the Dominion of Canada and the United Kingdom at book value (market value at 31st December 1946, \$30,290,209) -	30,099,238	41,299,659
Consumers' deposits lodged with government banks -	3,148,740	2,650,554
Accounts receivable less reserve -	8,332,024	6,008,703
Stores on hand and in transit as determined and certified by the management and valued at not more than cost -	17,081,873	12,717,256
	\$ 85,680,688	\$ 91,346,359
	\$477,998,209	\$452,395,825

NOTE.—The current assets and liabilities of the operating companies in Brazil were valued for the purposes of this balance sheet at the end of the year in dollars at the closing sight rate for exchange on New York.

The current assets and liabilities in Canadian dollars and in sterling were valued for the purposes of this balance sheet at the end of the year at the official rates for United States dollars.

The transfer of cash balances is subject to the exchange regulations of Brazil, Canada and the United Kingdom as the case may be.

LIABILITIES	31st December	
	1946	1945
Capital:		
Authorized—		
100,000 6% cumulative convertible preference shares of a par value of \$100 each of which 96,066 shares have been converted into ordinary shares.		
7,600,000 ordinary shares of no par value subject to increase up to a total of 7,933,333 shares of no par value by conversion of preference shares.		
Issued and outstanding—		
3,934 preference shares -	\$ 393,400	\$ 393,400
—7,029,893 ordinary shares -	179,358,230	179,358,230
Earned Surplus -	55,590,343	45,932,622
	\$235,341,973	\$225,684,252
Shares of subsidiaries in hands of public -	\$ 1,684,193	\$ 1,684,193
 Funded Debt:		
The Rio de Janeiro Tramway, Light and Power Company Limited—		
5% 50 year mortgage bonds (1st April 1958)—balance after sinking fund redemptions (£2,181,308) -	\$ 10,615,697	\$ 11,400,232
5% 22 year bonds (1st October 1950) (£271,334) -	1,320,493	1,320,493
The São Paulo Tramway, Light and Power Company Limited—		
5% perpetual consolidated debenture stock (£821,917) -	3,999,996	3,999,996
São Paulo Electric Company Limited—		
5% 50 year mortgage bonds (1st January 1962)—balance after sinking fund redemptions (£980,860) -	4,773,519	5,069,509
	\$ 20,709,705	\$ 21,790,230
NOTE—The funded debt expressed in sterling has been converted at U.S. \$4.862½ to the £.		
 Reserves and Provisions:		
Provision for depreciation (including depreciation of physical assets of subsidiaries not consolidated) -	\$108,431,679	\$104,771,762
Provision for amortization -	26,456,793	26,494,534
Sinking fund reserves -	17,756,872	16,667,958
General reserves -	12,035,556	10,862,021
Provision for contingencies -	17,465,439	12,300,404
	\$182,146,339	\$171,096,679
 Current Liabilities:		
Accounts payable and accrued charges -	\$ 17,542,329	\$ 14,495,877
Consumers' deposits (per contra) -	3,148,740	2,650,554
Liability for 5% 50 year mortgage bonds of The Rio de Janeiro Tramway, Light and Power Company, Limited drawn for redemption in 1947 -	608,965	531,895
Sharewarrant and bond coupons payable, dividend cheques outstanding and accrued interest on funded debt -	16,815,965	14,462,145
	\$ 38,115,999	\$ 32,140,471
	\$477,998,209	\$452,395,825

On behalf of the Board:
HENRY BORDEN,
E. C. FOX, } Directors.

AUDITORS' REPORT

*To the Shareholders of
Brazilian Traction, Light and Power Company, Limited:*

We have audited the Head Office accounts of Brazilian Traction, Light and Power Company, Limited, The Rio de Janeiro Tramway, Light and Power Company, Limited, Brazilian Telephone Company, The São Paulo Tramway, Light and Power Company, Limited, São Paulo Electric Company, Limited (and its subsidiary, The San Paulo Gas Company, Limited), The City of Santos Improvements Company, Limited and Brazilian Hydro Electric Company, Limited, and have examined the reports and statements submitted by other chartered accountants covering the capital and revenue accounts and provisions for depreciation in Brazil for the year ended 31st December, 1946. We have obtained all the information and explanations which we have required.

The aggregate profits and losses of subsidiaries, the assets and liabilities of which are not included in the consolidated balance sheet, have been fully provided for in the consolidated statement of profit and loss.

Subject to the foregoing, we report that, in our opinion, the attached comparative consolidated balance sheet, comparative consolidated statement of profit and loss and consolidated statement of earned surplus are properly drawn up so as to exhibit a true and correct view of the state of the combined companies' affairs at 31st December, 1946, and of their operations for the year ended on that date, according to the best of our information, the explanations given to us, the reports of the auditors in Brazil and as disclosed by the books of the companies.

CLARKSON, GORDON & CO., } *Auditors.*
Chartered Accountants, }

Toronto, May 9th, 1947.

**BRAZILIAN TRACTION, LIGHT AND POWER COMPANY, LIMITED
AND SUBSIDIARY COMPANIES**

COMPARATIVE CONSOLIDATED STATEMENT OF PROFIT AND LOSS

FOR THE YEARS ENDED 31ST DECEMBER 1946 AND 1945

(Expressed in terms of United States currency)

	Year ended 31st December	
	1946	1945
Gross earnings from operations - - - - -	\$78,253,700	\$65,150,899
Interest on temporary investments - - - - -	689,508	807,746
Other miscellaneous income - - - - -	117,673	221,733
Total revenue - - - - -	<u>\$79,060,881</u>	<u>\$66,180,378</u>
<i>Less:</i>		
Operating expenses including provision for taxes - - - -	\$47,079,254	\$35,219,518
Provision for depreciation- - - - -	5,490,531	5,528,381
Provision for amortization - - - - -	1,000,000	1,000,000
Total operating expenses, depreciation and amortization - -	<u>\$53,569,785</u>	<u>\$41,747,899</u>
Net profit before bond interest, sinking funds and other financial charges - - - - -	<u>\$25,491,096</u>	<u>\$24,432,479</u>
<i>Less:</i>		
Bond interest - - - - -	\$ 1,464,359	\$ 1,455,845
Sinking funds and other financial charges- - - - -	925,256	764,118
Total interest and other financial charges - - - - -	<u>\$ 2,389,615</u>	<u>\$ 2,219,963</u>
Net profit for the year - - - - -	<u>\$23,101,481</u>	<u>\$22,212,516</u>

NOTE—Remuneration of directors (excluding executive officers) including payments by subsidiary companies amounted in 1946 to \$18,926;

Remuneration of counsel, solicitors and legal advisers and executive officers including payments by subsidiary companies amounted in 1946 to \$528,950.

CONSOLIDATED STATEMENT OF EARNED SURPLUS

FOR THE YEAR ENDED 31ST DECEMBER, 1946

(Expressed in terms of United States currency)

Balance 31st December, 1945 - - - - -		\$45,932,622
Net profit for the year ended 31st December, 1946 - - - - -		<u>23,101,481</u>
		\$69,034,103
<i>Less dividends:</i>		
Preference shares—	Canadian dollars	Equivalent in U.S. dollars
\$6.00 per share - - - - -	\$ 23,604	\$ 22,542
Ordinary shares—		
\$1.00 per share 20th June, 1946 - - - - -	\$ 7,026,792	
\$1.00 per share 2nd Dec., 1946 - - - - -	7,026,837	
	<u>\$14,053,629</u>	<u>\$13,421,218</u>
Balance 31st December, 1946 - - - - -		<u>\$55,590,343</u>

STATISTICS OF COMBINED COMPANIES

SERVICE	1942	1943	1944	1945	1946
TRACTION					
<i>Tramways (including Funicular Railway)</i>					
Total Track (miles) - - - - -	532.30	532.21	530.50	529.63	527.90
Number of cars - - - - -	2,331	2,341	2,339	2,338	2,340
Electric Locomotives - - - - -	4	4	4	4	4
<i>Buses</i>					
Route (miles) - - - - -	121.34	124.60	132.37	132.37	138.13
Number of buses - - - - -	142	142	142	118	93
<i>Total Passengers Carried</i> - - - - -	1,160,506,565	1,253,073,742	1,289,812,422	1,239,612,655	1,162,589,794

ELECTRIC LIGHT AND POWER

Kilowatt-hours Sold - - - - -	1,984,507,419	2,148,027,358	2,395,847,529	2,606,418,262	2,825,522,186
Capacity of Generating Plants (K.W.) -	591,509	612,570	612,570	662,570	662,570
Total Connected Load (K.W.) - - -	1,392,522	1,482,911	1,564,806	1,725,853	1,839,043
Total Consumers - - - - -	622,051	654,375	662,734	694,957	731,751
Transmission Lines (miles of circuit) -	2,082.92	2,063.08	2,090.80	2,091.33	2,069.31
Distribution Lines (miles of wire) - -	32,066.90	33,118.17	34,125.55	35,332.60	36,759.23

GAS

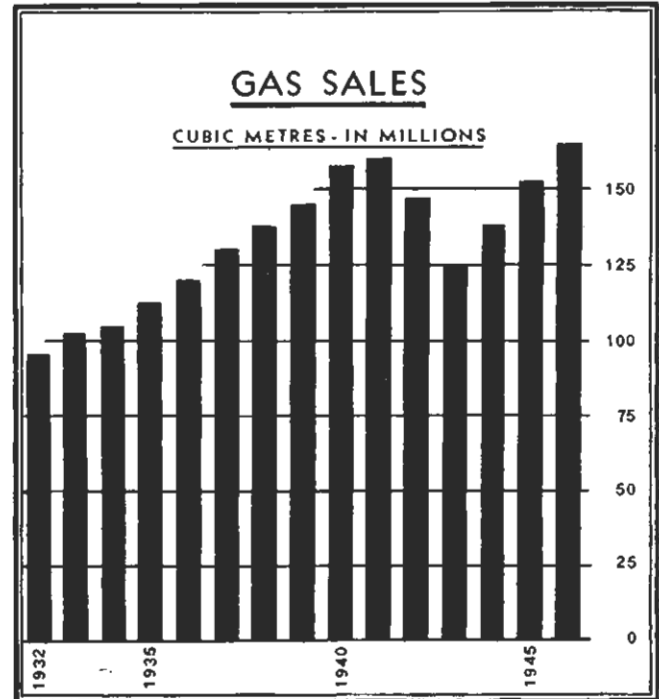
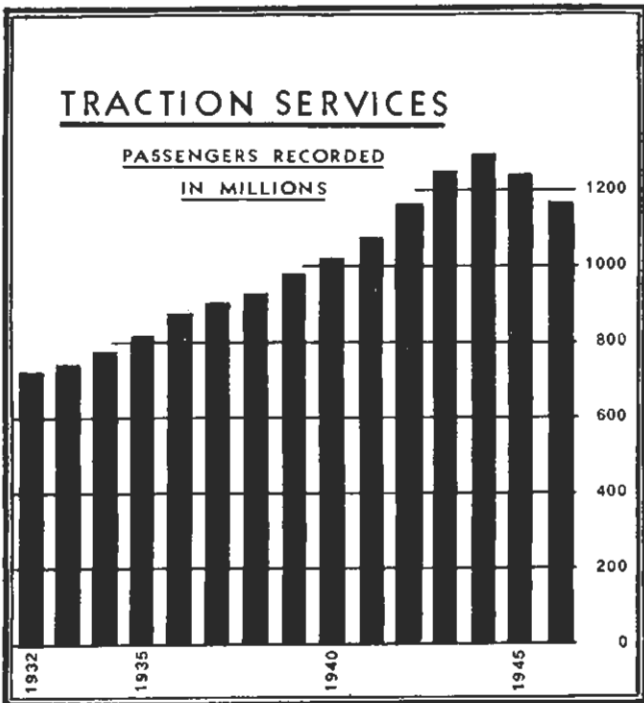
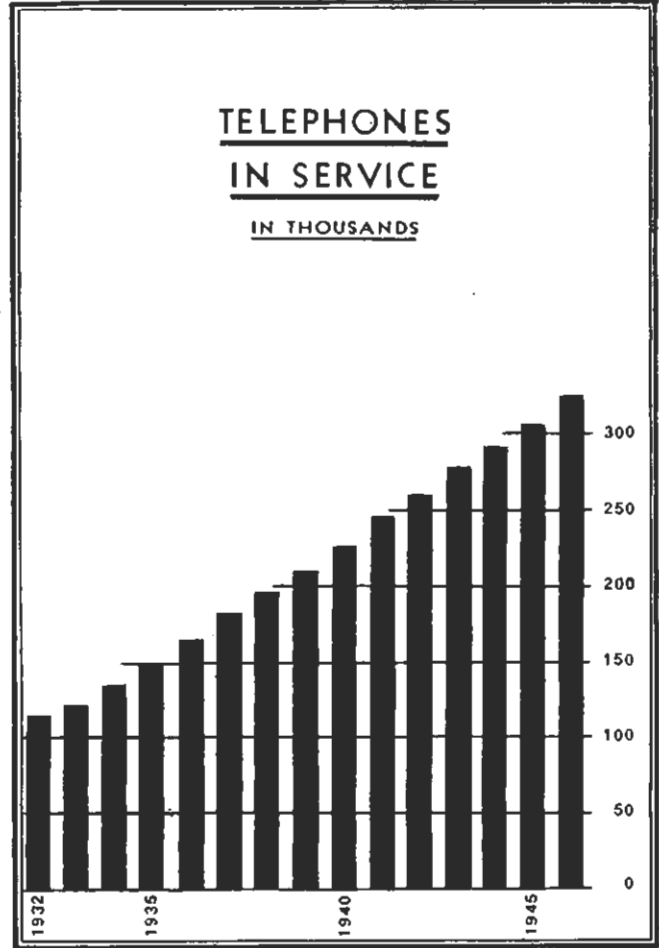
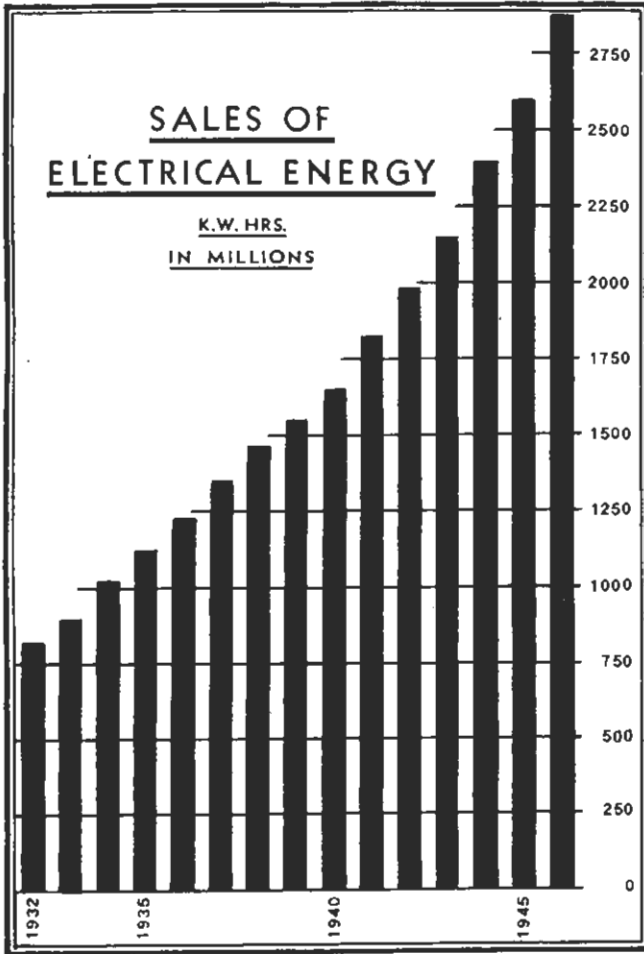
Gas Sold (Cubic metres) - - - - -	144,082,607	125,387,787	138,980,937	152,175,571	166,081,567
Total Consumers - - - - -	162,745	165,413	170,426	178,108	181,746
Mains Laid (miles) - - - - -	1,238.17	1,245.92	1,250.04	1,259.87	1,272.23
Stoves, Water Heaters and Other Appliances - - - - -	185,691	186,271	186,962	188,181	189,465

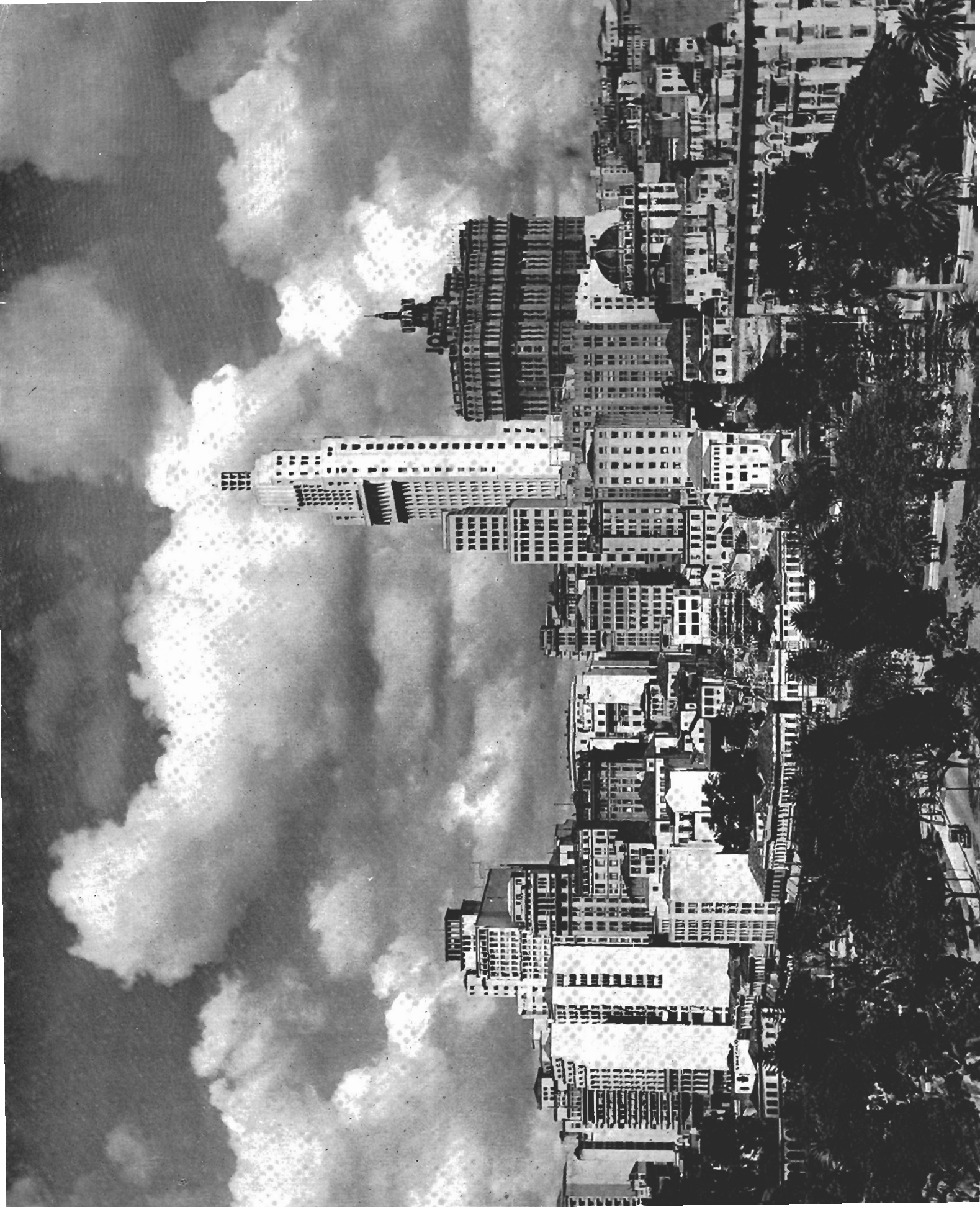
WATER

Water Sold (Cubic metres) - - - - -	12,533,660	12,737,644	13,165,587	13,007,566	13,275,009
Total Consumers - - - - -	23,497	23,834	24,217	24,625	25,312
Trunk Mains Laid (miles) - - - - -	37.91	37.96	37.97	37.68	37.76
Distribution Mains Laid (miles) - - -	265.95	267.69	269.58	272.11	275.72

TELEPHONES

Total Number of Telephones in Service	261,549	277,734	290,880	305,889	325,893
Average Daily Calls - - - - -	4,432,723	4,684,549	5,113,921	5,531,667	6,159,054
Wire Strung (miles) - - - - -	1,218,008	1,280,776	1,403,366	1,512,224	1,545,874
Pole Lines (miles) - - - - -	7,683	7,740	7,818	8,044	8,268







Company's main office in São Paulo