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The future of the international railways of South America. A historical approach

*Robert T. Brown**

In the closing decades of the last century and the first decades of the present century railways were regarded as an ideal means of linking the countries of America economically. Clear evidence of this aspiration is provided by the attempts —pursued over many years, but finally frustrated— to build a Pan-American Railway to link North, Central and South America, and the efforts of the Farquhar group to consolidate and link together railways in the southern part of the continent on the basis of control of the Brazil Railway Company.

After noting these pioneering attempts the author analyses the most important international railway section in South America, and the role played by Governments in their construction. The financial procedures used for the construction of the railways varied greatly — at the expense and risk of capitalists from outside the continent, by concession holders from outside the continent who were given incentives by Latin American Governments, by individual Governments themselves, and so on—but in almost all cases substantial public support was given to these enterprises.

Nevertheless, errors in administration, such as poor commercial and operational co-ordination among the countries, and external dependence in respect of the most important decisions, seriously hampered the use of this expensive infrastructure. Some of these problems still persist, and it is urgently necessary to overcome them to ensure that railways can play their proper role in rapidly expanding Latin American trade. This has been the objective of the Latin American Railways Association (ALAF) since its establishment in 1964.

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Introduction*

In 1964 I had an opportunity to devote a year to studying transport and its role in the economic integration of South America.¹ This research was carried out taking the continent as a single area in order to identify—through an analysis of the distribution of population and resources, and physical barriers—the needs of transport as a factor in integration. During my work I was struck by the fact that in the Southern Cone there were more than a dozen international rail connexions. Among the routes I only then learned about, I discovered the one which links the port of Antofagasta on the Pacific with Santos on the Atlantic. At that moment I decided to make the journey by train from ocean to ocean as soon as possible. Nine years later, in 1973, the dream materialized when, with colleagues from the CEPAL Transport Division, I accompanied two copper wagons from Antofagasta to São Paulo. The copper was transported without any transshipments, and the wagons were not opened once over the entire journey of 4,216 km.² The stamps affixed by the Chilean customs at the beginning of the journey are at present exhibited in the office of the Central Secretariat of ALAF in Buenos Aires.

In addition to my surprise at learning, in 1964, that there were at least 13 international rail connexions in South America, I was astonished to see how little some of them were used. With annual traffic of only 50,000 or 100,000 tons, an international railway cannot run economically, and its very existence may be difficult to justify. What is the explanation for the failure to make use of this physical infrastructure? If one proceeds from the premise that, at some moment in the past,

*Paper prepared for the Seminar on International Rail Transport held in the Centro de Estudios Superiores de the Spanish National Railway Network (RENFE) in Madrid, Spain, between 4 November and 7 December 1978.

¹See Robert T. Brown, *Transport and the Economic Integration of South America* (Washington, The Brookings Institution, 1966).

²See "Servicios de transporte terrestre internacional en los corredores Lima-Buenos Aires y Lima-São Paulo" (E/CEPAL/1007), pp. 249-289.

someone realized how useful these connexions would be, and was prepared to make the necessary investment for their construction, is the present low rate of use of the international sections due to loss of the visionary thrust of the builders? Or have conditions changed, leaving infrastructure suitable for another age now obsolete?

In 1964 I was unable to pursue by inquiries in the search for an answer to these questions; but now, in preparing this paper, I have had an opportunity to return to them. In this research I examined the efforts, dating back 100 years, to construct international railways in South America, and I attempted to recapture the vision of their promoters and to determine whether as time has passed we have lost something fundamental, which might perhaps guide us in an age when international railways are facing ever-greater challenges. In the first place, I followed up an idea which arose in the last century, that of a Pan-American Railway which would link the United States and South America, and the attempts of the United States promoter Percival Farquhar, at the beginning of the present century, to integrate within a single railway system the networks in southern Brazil and Argentina, Uruguay, Paraguay, Bolivia and Chile. I then examined the initiatives which led to each of the international sections which now exist.

The results of this research, which I shall

endeavour to outline here, were a surprise to me. Briefly, my conclusions are:

a) Although there were persons outside South America who had a broad vision of the role which an extensive network of international railways could play in the region, their activities led only to the construction of international sections which would have been constructed even without their intervention.

b) It was the South American governments which, with a clear perception of the value of economic co-operation among the countries of the region, stimulated and bore the risk of the creation of these international links, although foreign technology and capital—which was mainly European in origin, and which in turn was partly used to purchase equipment and components manufactured in Europe—made their construction possible.

c) Nevertheless, these same governments, after making major sacrifices to create this physical infrastructure, failed to ensure that appropriate measures were taken to guarantee commercial and operational co-ordination which make it possible to obtain the expected benefits. As will be seen below, even the very promoters who perceived the importance of instituting such co-ordination, and who for a time controlled the entire management of various international sections, were unable to achieve this objective fully.

I

The Pan-American Railway

For more than half a century the idea of a Pan-American Railway linking North, Central and South America was of particular attraction within the inter-American system and in professional engineering circles in the three Americas. The intellectual inspiration came from the United States, but the idea met with support throughout the continent.

There is evidence of independent, but almost simultaneous initiatives by three United States diplomats who urged the construction of a railway which, starting in the southern United States, would continue through Central

America and the Pacific countries of South America, terminating in the Southern Cone. Between 1870 and 1873, both Francis Thomas, United States Minister in Peru, and J. T. Root, Minister of Chile, proposed this major enterprise to the State Department. The latter used the following words:

"This railway will open the way to progress for American enterprise trade and manufactures, and in a multitude of ways would be of the greatest financial benefit to the United States, without considering the important and noble objective pursued, namely the

peaceful settlement of the constant civil tumults and disputes which have always existed in the past..."³

However, the best-known of all these initiatives was that of Hinton Rowan Helper, who was United States consul in Buenos Aires between 1862 and 1866. It was he who had the idea of an intercontinental railway when suffering from terrible seasickness in the sailing ship carrying him back to New York at the end of his stay in Argentina. In 1879 Helper popularized the idea in his *Oddments of Andean Diplomacy and Other Oddments*, followed in 1881 by *The Three Americas Railways*, which contains the prize-winning essays and poems from an international contest he sponsored on the subject. In his first work Helper wrote:

"The dwellers in those countries have millions of square miles of fertile lands and precious metals and tropical forests and fruits, and other sources of inexhaustible wealth, the true values of all of which we shall help them to develop, in a cheerful spirit of ready amenability to the great commercial law of demand and supply; and, on the other hand, we shall sell to them at handsomely remunerative profits to ourselves, tens of thousands of carloads of our surplus manufactures and our other merchantable products, which, while fitly affording them all promised gratification, will constantly create within them a craving for still newer and better things, and will thereby, for the first time in their lives, awaken within them the exquisite delights of self-regulated and rightful unrest, activity and achievement."⁴

Helper's ideas fell on fertile ground in the United States, since at that time, when the construction of railways was proceeding at the fastest rate in United States history, the role that railways played in the development of a country was generally recognized. The wish of some circles in the United States to use the construction of a Pan-American Railway to destroy European domination of Latin Ameri-

can markets, which was to a substantial extent due to British control of shipping routes, seems rather unrealistic today if one considers the distances which have to be covered. Nevertheless, bearing in mind the prestige achieved at that time by railways as an instrument of political and economic integration, it is not surprising that the first International Conference of American States, which met in Washington from October 1889 to April 1890, agreed:

"First. That a railroad connecting all or the majority of the nations represented in this Conference will contribute greatly to the development of cordial relations between said nations and to the growth of their material interest.

"Second. That the best way to facilitate its realization is the appointment of an International Commission of Engineers to ascertain the possible routes, to determine their true length, to estimate the cost of each, and to compare their respective advantages...

"Fifth. That the railroad, in so far as the common interest will permit, should connect the principal cities lying in the vicinity of its route.

"Twelfth. That the realization of an undertaking of such magnitude deserves to be encouraged by means of subsidies, land concessions or guarantees of a certain minimum interest."⁵

Reaction to the Conference's proposal was immediate, and the United States Congress voted an appropriation of US\$ 65,000; still more importantly, it authorized the President to include officers from the army and navy in groups to survey the itinerary of the proposed railway. In 1890 the International Commission of Engineers met for the first time, and in the following year three survey teams were dispatched to Central and South America. The results and recommendations of the teams were published in six volumes in 1899.⁶

The route selected by the Commission followed that proposed in the resolution adopted by the first Interantional Conference of American States. Beginning in Ayutla, on

³Translated from Santiago Marín Vicuña, *Sobre Ferrovías Internacionales*, (Santiago, Chile, Cervantes, 1928), p. 6.

⁴Rowan Hinton Helper, *Oddments of Andean Diplomacy and Other Oddmenst*, (St. Louis, W.S. Bryan, 1879), p. 15.

⁵Luis Ernesto Denegri, *El Ferrocarril Pan-Americano* (Lima, Torres Aguirre, 1928), pp. 3-4.

⁶John Anthony Caruso, "The Pan American Railway", *The Hispanic American Historical Review*, (Durham, N.C.), vol. XXXI, N.º 4 (November 1951).

the border between Mexico and Guatemala, the route crossed Central America and continued through Colombia, Ecuador, Peru and Bolivia, terminating in La Quiaca, on the border between Bolivia and Argentina (see map). In general, it made use of the already existing railways, and connected the main centres of population in the Andean region, but the route had the drawback of running parallel to the Pacific Coast, in addition to requiring engineering works in the Andean chain. Concerning this route, Charles M. Pepper, a fervent advocate of the intercontinental railway, wrote in his 1904 report presented to the United States Congress by President Theodore Roosevelt:

"It will arrive in Quito, the start of the road which, in the time of the Incas, linked Quito to Cuzco, the Imperial City, 1,900 miles away. Leaving Quito behind, the traveller will skirt the base of the gigantic Chimborazo, then climb its side to a height of 12,000 feet, as if climbing a mountainous ladder step by step, since these transverse masses known as *nudos* are the characteristic features of the Andes in Ecuador. He will enter Peru by the Sabanilla Pass, crossing and recrossing from the Pacific to the Atlantic slope, between precipices and glaciers at an altitude of 13,000 or 14,000 feet, until he arrives in the mining area of Cerro de Pasco at 14,300 feet, one of the highest human settlements in the world, from whence, alternately rising and descending, he will arrive in Cuzco, the old Inca capital, at an altitude of 11,000 feet, and will continue onwards, by a relatively flat route, to Puno, on Lake Titicaca, at 12,540 feet."⁷

This description was to cause concern to

anyone interested in financing the operations. In the words of the Peruvian engineer Luis Ernesto Denegri, who argued in favour of the original route at the Sixth International Conference of American States, held in Havana in 1928:

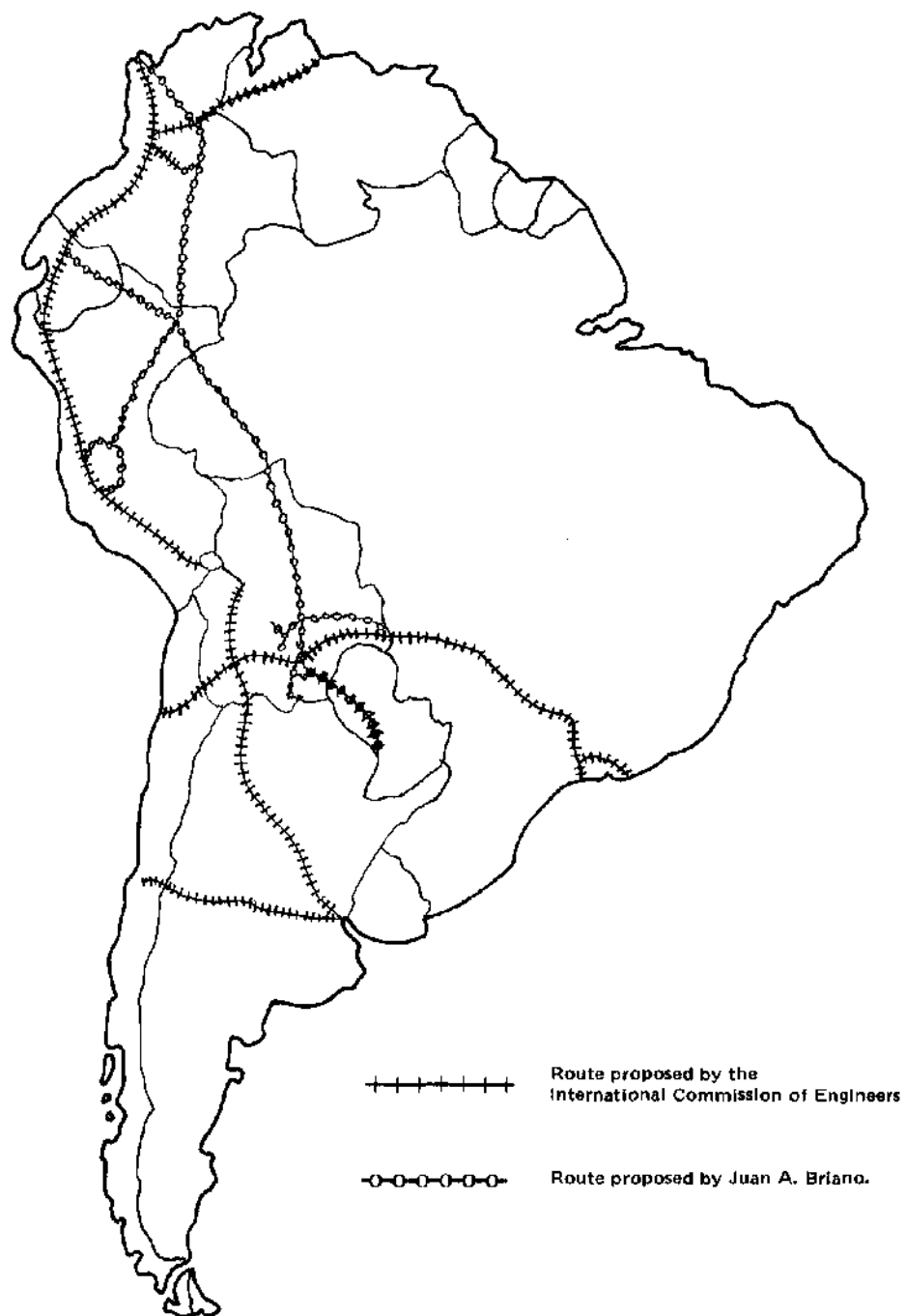
"Reading Mr. Pepper's dantesque description, one would think that the Pan-American Railway had been planned not by men desirous of linking peoples together, but by demons anxious to lead us by railway up hill and down dale, shivering from the proximity of the eternal snows and the lashes of icy winds, and at every instant having the terrifying vision of imminent avalanches and fathomless precipices in which it appears impossible not to fall; anxious, I repeat, to lead us to the highest altitudes on earth, only to hurl us to the abyss, yawning below like some new hell, where we are to atone for a new sin."⁸

The Second International Conference of American States, held in Mexico in 1903, endorsed the resolution adopted by the First Conference, and also set up a Standing Committee. Discussion of the subject continued, both in this Committee and at succeeding inter-American conferences, up to the 1930s. Nevertheless, it became increasingly evident that the railway was never going to be built, despite the efforts of the Argentine engineer Juan A. Briano, from 1919 onwards, to shift the route towards the interior of the continent (see map). The Pan-American Railway remained the dream of a few romantic diplomats and engineers, and 50 years of activity failed to materialize in the form of the construction of a single kilometre.

⁸Denegri, *op. cit.*, p. 103.

⁷Translated from Santiago Marín Vicuña, *Política ferroviaria de la América* (Santiago, Chile, Imprenta Universitaria, 1927), p. 32.

ROUTES PROPOSED FOR THE PAN-AMERICAN RAILWAY



II The Farquhar group

One of the most fascinating episodes in the history of Latin American railways is made up of the efforts of a group of United States and Canadian promoters, led by Percival Farquhar, between 1906 and 1913, to consolidate a railway system in southern Brazil and extend it to Argentina, Uruguay, Paraguay, Bolivia and Chile. Financing was carried out through the London capital market, but the capital itself originated mainly with French and Belgian investors. This episode helps us to gain an idea of the view held by foreigners on the role of railways in the development of South America at the beginning of the present century.

Percival Farquhar arrived in Rio de Janeiro in 1905, after building railways in Cuba and Central America. He was struck by the fact that the railway system in Brazil consisted of unconnected lines to ports, without adequate connexions one to another in a north-south direction. He pointed out that, by consolidating the lines in southern Brazil into a single system, he could apply the model of the Canadian Pacific railway in Canada, which had already been tested with success, since a number of the railway concessions also included huge concessions of land which Farquhar considered suitable for settlement.⁹

In November 1906, Farquhar set up the Brazil Railway Company in Portland, Maine, as a holding company which eventually controlled 38 other companies.¹⁰ One of Farquhar's first acts was to use his new company to purchase the Joaquim Catramby concession in order to build the Madeira-Mamoré railway, an international railway on the border between Brazil and Bolivia which would solve the problem of the rapids which made navigation impossible on the river Mamoré.¹¹

Construction of this railway lasted from

1907 to 1913, and cost US\$ 33 million at that time (equivalent to about US\$ 250 million today), or about US\$ 90,000 per kilometre. The work, in one of the most dangerous Amazonian areas, cost the lives of 3,600 men, and only by annually engaging more than 8,000 workers was it possible to maintain a work force of 2,700.¹² It was this successful and dramatic effort which firmly established Farquhar's reputation in South America.

However, of greater interest to us are his activities in the far south of Brazil. In 1906 Farquhar paid US\$ 1 million for 94% of the shares in the São Paulo-Rio Grande railway, which at that time was still incomplete and would not produce any return for a long time to come. It ran northwards from Ponta Grossa in Paraná to the border of São Paulo State, near Itararé, and southwards to União da Vitória on the river Iguaçu, crossing it by what was at that time the longest bridge in Brazil to reach Porto União, in Santa Catarina State. The railway ended there, but there were concessions to extend the line southwards, across the unpopulated forests of Santa Catarina to the town of Marcelino Ramos on the river Uruguay. Of greatest interest to Farquhar was the land concession held by the railway in Paraná and Santa Catarina, totalling 2.4 million hectares, and he immediately began the extension of railway, reaching Marcelino Ramos in 1910.¹³

In 1907 Farquhar leased from São Paulo State, for 60 years, the Sorocabana railway, more than 1,000 kilometres long, thus obtaining a direct line to São Paulo. In 1908 he gained control of two railways competing with the Sorocabana: 27% of the Companhia Mogiana de Estradas de Ferro e Navegação (1,180 km), and 38% of the Companhia Paulista de Vias Férreas e Fluviais (925 km). In 1910 he added to his Brazil Railway Company the Paraná railway, which ran from Ponta Grossa through

⁹Charles A. Gauld, "The Last Titan: Percival Farquhar, American Entrepreneur in Latin America", *Hispanic American Report* (Stanford University, California), special issue, 1964, pp. 161-167.

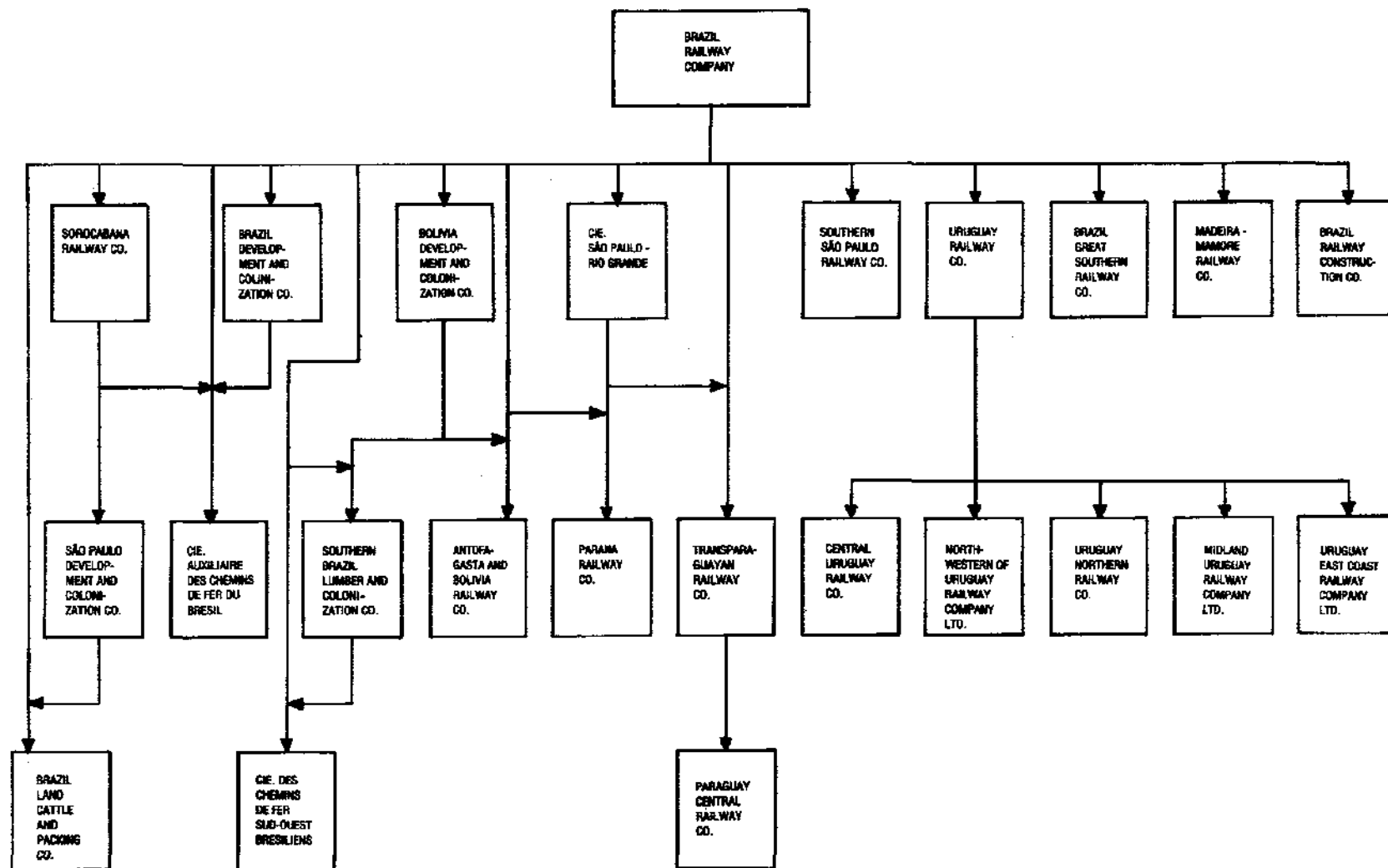
¹⁰*Ibid.*, p. 233.

¹¹*Ibid.*, p. 126.

¹²*Ibid.*, pp. 132 and 145.

¹³*Ibid.*, p. 166.

LINKS BETWEEN THE BRAZIL RAILWAY COMPANY AND COMPANIES IT DIRECTLY OR INDIRECTLY CONTROLLED OR INFLUENCED, IN 1915



Source: Frederick A. Molitor, *Report on the Railway Properties in Southern Brazil leased, owned or controlled by the Brazil Railway Company* (New York, John Ward and Son, 1915).

Curitiba to the port of Paranaguá, the Dona Teresa Cristina railway, the Norte do Paraná Railway and the Sul de São Paulo railway.¹⁴

Also in 1910, Farquhar purchased more than 70% of the shares, and thus gained control, of the 2,100 km system belonging to the Compagnie Auxiliaire des Chemins de Fer du Brésil which served the State of Rio Grande do Sul. This railway connected with the São Paulo-Rio Grande railway at Marcelino Ramos, and had already extended its lines up to Uruguaiana, on the border between Argentina and Brazil. As a result of the construction and consolidation of lines in Brazil, including the new line to the border with Uruguay, a direct service between São Paulo and Montevideo was begun in 1913.¹⁵

His success in Brazil induced Farquhar to look towards the neighbouring countries. In 1912 he set up the Argentina Railway Company, which also had its headquarters in the State of Maine. This new company offered US\$ 70 million to the Government of Argentina for the acquisition of the State railways, but the Government demanded US\$ 100 million, together with an undertaking to standardize the gauge of all the lines. Although Farquhar did not succeed in reaching agreement, the Argentine Government supported his idea of centralizing control of the railways north of Mesopotamia. Farquhar immediately gained control of the Ferrocarril Entre Ríos, the Ferrocarril Noreste de Argentina, and the Ferrocarril Rosario y Puerto Belgrano, which he consolidated with the Ferrocarril Central Córdoba.¹⁶

Despite this success, there were heated protests in Argentina at this interference in the national railways by the United States promoter, and the reaction was not limited to Argentina, but was substantial in Brazil also. This was partly due to Farquhar's acquisition of control of the Ferrocarril Central del Uruguay, which gave him a line between Montevideo and the border towns of Rivera and

Livramento. Meanwhile, in London Farquhar gained control of the Ferrocarril Central de Paraguay, which was still being built between Asunción and Encarnación.¹⁷ In 1912, at the climax of his efforts to consolidate the railways in the Southern Cone, he acquired a large share in the Antofagasta to Bolivia railway through his Bolivia Railway Company. His aim at that moment was to extend a new line across Paraguay in order to build a transcontinental railway. Nevertheless, the following year he sold his shares at a very substantial loss.¹⁸

Farquhar did not restrict himself to buying railway concessions and lines to consolidate an international system: following the successful model used in Canada, he also sought to settle the land along his railways in order to generate demand for freight which would make them pay.

For this reason, he had great interest in the land included in the railway concessions in Brazil, and on the basis of such concessions established colonization companies. These companies developed the areas with greatest economic potential, selling land to colonists from Europe and other parts of Brazil. As a complement to development based on settlement in Brazil and Paraguay, Farquhar saw the potential of livestock raising and the timber industry. In 1910 and 1911, Farquhar opened large sawmills in Brazil to process Paraná pine destined for the markets of São Paulo, Montevideo and Buenos Aires, while in 1912 he constructed the first meat packing plant in Osasco, some 10 km from São Paulo on the Sorocabana railway. In Paraguay, through such companies as the Paraguay Land and Cattle Co., and the Compañía Industrial Paraguaya, Farquhar obtained huge stretches of land, about 5 million hectares, and set up meat packing plants.¹⁹

By the end of 1912, Farquhar controlled an enormous empire of railways, ports and land.²⁰ In Brazil alone he estimated that he

¹⁴*Ibid.*, pp. 172-176.

¹⁵*Ibid.*, p. 178.

¹⁶Simon C. Hanson, "The Farquhar Syndicate in South America", *The Hispanic American Historical Review*, (Durham, N.C.), vol. XVII, N.º 3 (August 1937), p. 321.

¹⁷Gauld, *op. cit.*, pp. 239-241.

¹⁸Hanson, *op. cit.*, p. 323.

¹⁹Gauld, *op. cit.*, pp. 209-221.

²⁰The diagram reproduced below indicates the complex financial structure which still existed in 1915.

had invested about £ 45 million,²¹ which, taking into account inflation between 1912 and 1978, would amount to some US\$ 1,700 million today. Even so, the Brazil Railway Company was seriously underfinanced, because of the losses inevitably incurred by the subsidiary companies in livestock raising, land settlement and timber, which required a long gestation period. Keeping the empire going was possible only through new infusions of capital, but the capital market in Europe on the eve of the first world war was not favourable. Farquhar himself was speculating in shares in the Brazil Railway Company, and at the beginning of

1913 realized that he was personally ruined.²² Furthermore, the Brazil Railway Company, the owner and operator of a rail system covering more than 4,300 km, with an interest in a further 2,400 km, had largely been financed through the sale of bonds instead of shares; in 1914 it could not pay the interest on them, and passed into the hands of a receiver from the State of Maine.²³ Farquhar's empire had collapsed, and with it disappeared too the possibility of realizing the dream of an integrated railway system in the Southern Cone of America.

III Identification of the international railways

It is clear, from this summary of the experience of the promoters of a Pan-American Railway and the effort of Percival Farquhar to consolidate an international railway system, that despite the emphasis of these men on integration, these episodes led only to the construction of connexions which would have been built in any case. Although foreign capital was frequently indispensable, and although the example of railways as driving forces of development in other continents had served as an inspiration, the thrust in favour of the construction of international railways did not come from outside the continent, but from within the South American countries themselves.

Before exploring in greater detail the role of South American governments in the construction of the international railways, it is necessary to identify the sections which can be considered as genuine international railways. Thus, for example, although a railway exists between Valparaíso and Buenos Aires, the sections between Valparaíso and Los Andes, and between Buenos Aires and Mendoza, were built for the purpose of national integration. In the case of the section between Buenos Aires and

Mendoza, one of its objectives was to direct towards the ports of Buenos Aires and the Paraná river the trade which previously used Pacific ports.²⁴ This does not mean that the governments did not have such a vivid awareness of the role of international railways as foreign diplomats, engineers and promoters, but merely that the railway would have been built to Mendoza in any case, even if it had been impossible to extend the line into Chile.

Accordingly, identifying the international railways is not easy, since the criterion used is not whether they are used for international traffic or not, but the reason for which specific sections were constructed. Even in the apparently very clear case of the railway between Tacna, Peru and Arica, Chile, from this point of view it is not an international railway, since both towns belonged to Peru when the railway was completed in 1856, and it was not converted into an international route until 1929, when the border between the two countries was fixed between these two localities.

The table below shows the 13 border connexions which will be examined in this study; it also attempts to identify the sections built largely in order to provide an international

²¹ Hanson, *op. cit.*, p. 319.

²² Gauld, *op. cit.*, pp. 247-248.

²³ *Ibid.*, pp. 255 and 263.

²⁴ Eduardo A. Zalduendo, *Libras y rieles* (Buenos Aires, El Coloquio, 1975), p. 352.

INTERNATIONAL RAIL SECTIONS

Countries	Border connexion	International section	Distance to border (km)	International line	Distance to border (km)
Chile	Ollagüe	Antofagasta	439	Antofagasta	439
Bolivia	Frontera	Uyuni	175	La Paz	734
			614		1 173
Peru	Puno	Juliaca-Guaqui	252 ^a	Matarani-Guaqui	728
Bolivia	Guaqui	Guaqui-La Paz	107	Guaqui-La Paz	107
			359		835
Chile	Caracoles	Los Andes	71	Valparaíso	211 ^b
Argentina	Las Cuevas	Mendoza	185	Buenos Aires	1 239 ^b
			256		1 450
Argentina	Paso de Los Libres	Monte Caseros	98	Buenos Aires	716 ^c
Brazil	Uruguaiana	Cacequí	261	Rio de Janeiro	2 659 ^d
			359		3 375
Brazil	Livramento	Entroncamento	156	Rio de Janeiro	2 559 ^d
Uruguay	Rivera	Tacuarembó	118	Montevideo	555
			274		3 114
Chile	Visviri	Arica	206	Arica	206
Bolivia	Charaña	Viacha	210	La Paz	252
			416		458
Argentina	Posada	Paso de Los Libres	347	Buenos Aires	1 062 ^e
Paraguay	Encarnación	Asunción	376	Asunción	376
			723		1 438
Argentina	La Quiaca	Jujuy	284	Buenos Aires	1 797 ^e
Bolivia	Villazón	Atocha	196	La Paz	848
			480		2 645
Brazil	Jaguarão	Basilio	114	Rio de Janeiro	2 869 ^d
Uruguay	Río Branco	Treinta y Tres	123	Montevideo	460
			237		3 329
Chile	Socompa	Augusta Victoria	181	Antofagasta	334
Argentina	Socompa	Salta	571	Salta	571
			752		905
Brazil	Corumbá	Campo Grande	514	Santos	1 824
Bolivia	Puerto Suárez	Santa Cruz	651	Santa Cruz	651
			1 165		2 475
Argentina	Pocitos	Embarcación	145	Buenos Aires	1 849
Bolivia	Yacuiba	Santa Cruz	539	Santa Cruz	539
			684		2 388
Uruguay	Salto	Salto	13	Montevideo	594
Argentina	Concordia	Concordia	10 ^f		
Paraguay				Asunción	1 009
			23		1 603

^aIncludes 204 km. of lake crossing between Puno and Guaqui.

^bVia the 1.676 m. gauge San Martín railway between Mendoza and Buenos Aires. By the 1 m. gauge Belgrano railway the distance is 1.636 km.

^cIncludes a 67.8 km. ferry crossing to Zárate. When the bridge for rail traffic is open the distance will be shorter.

^dVia Marcelino Ramos.

^eBy the 1.676 m. line between Tucumán and Buenos Aires. By the 1 m. gauge line the distance is 2.119 km.

^fEstimated distance.

SOUTH AMERICAN RAILWAYS CONTROLLED BY THE FARQUHAR GROUP AROUND 1912

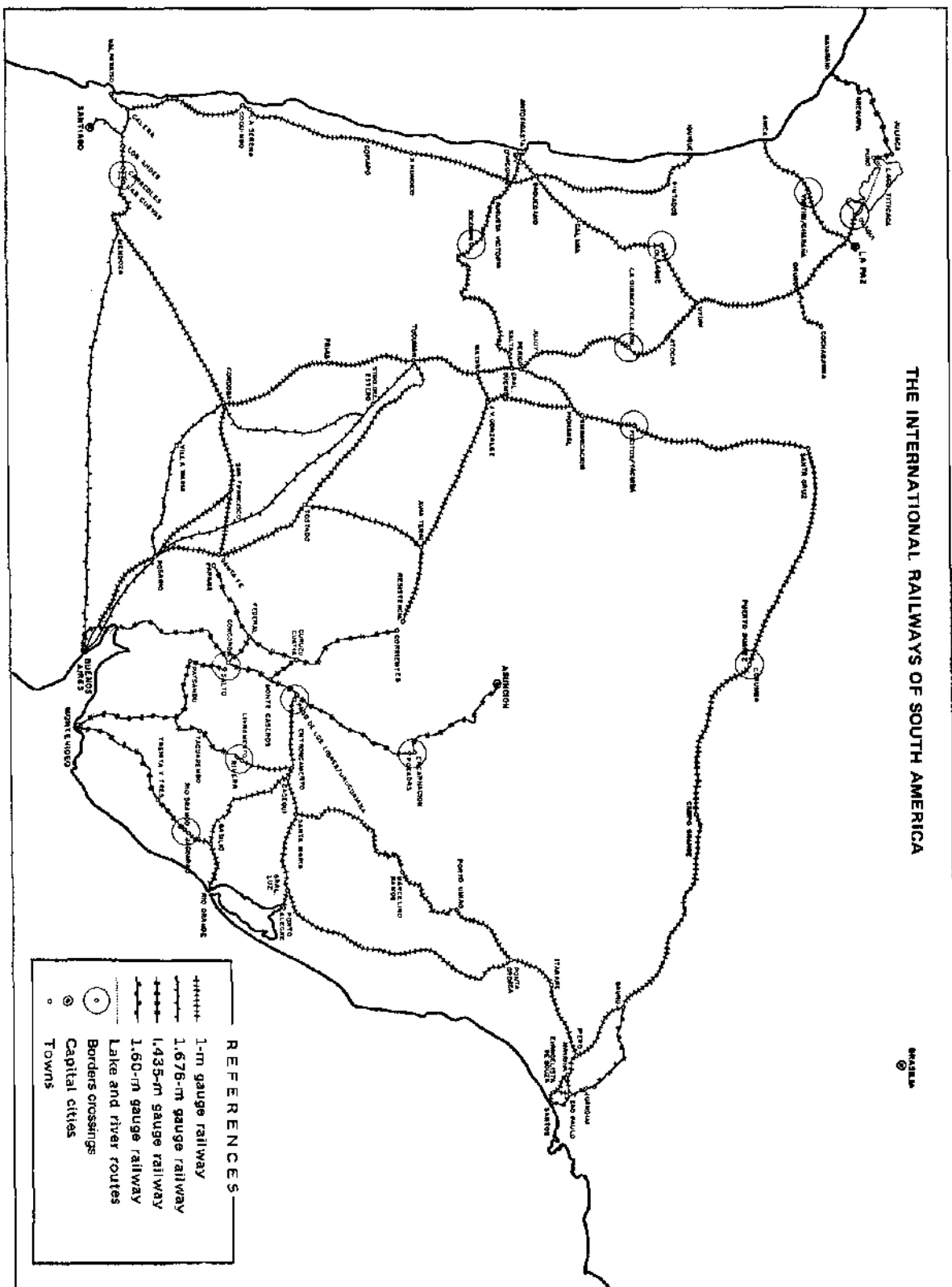


service. As will be seen below, this classification is sometimes arbitrary, and in more than one case it is certainly erroneous. The table also shows the international railway route of which

the section is part. In order to indicate the geographical setting of the various connexions, sections and routes within South America, the table is followed by a map.

THE INTERNATIONAL RAILWAYS OF SOUTH AMERICA

BRASIL



REFERENCES

- 1-m gauge railway
- 1.676-m gauge railway
- 1.435-m gauge railway
- 1.60-m gauge railway
- Lake and river routes
- Borders crossings
- Capital cities
- Towns

IV

Role of governments in the construction of the international sections

An analysis of the planning and construction of the international sections identified in the text above shows that, with a few exceptions, these sections were the result of the efforts of the governments of South American countries. Until the last decade, which saw the emergence of such initiatives as the creation of LAFTA and the agreements for the construction of the binational dams in the River Plate Basin, it was no exaggeration to say that these sections represented the best example in the continent of economic co-operation among developing countries. Indeed, in some cases where interests from outside the continent played an important role, such as the trans-Andean railway between Los Andes and Mendoza, the result of the intervention of the foreign companies was actually prejudicial to the countries, and it was not possible to secure significant benefits until the governments took over the management of the sections.

The reasons which prompted the governments to undertake these major enterprises in economic co-operation ranged from some self-interested local pressure to obtain railway links of local benefit to the attitude of those who saw international railways as the motive for Latin American integration and development. Among the latter, few could surpass in enthusiasm Guillermo Rawson, the Argentine Minister of the Interior, when he wrote in 1870:

"When we have constructed the scarcely two hundred leagues that separate us from Chile, an immense revolution will have taken place in the commercial routes of the world. Then it will be necessary to widen the streets and highways of Buenos Aires so that there will be room for the masses of human beings, made up of all races and laden with the infinite variety of their wealth, who will comfortably transact their business, leaving behind them among us the trail of gold and of light which the civilization of

this century displays in its most splendid manifestations."²⁵

Nevertheless, the fact that the governments have continued to construct international sections up to the present indicates that the existing connexions are not solely due to temporary enthusiasms of the past.

Since the management, financing and construction of some of the international sections do not differ greatly from those of the national railways, it appears useful to summarize the three principal ways of carrying out these activities in South America since the middle of the past century. The first, and probably the most widespread in the countries of the River Plate Basin, took the form of concessions to private companies accompanied by substantial State incentives and subsidies. Under this formula, a promoter sought a State concession for the construction and operation of a railway line. Sometimes, the line formed part of a State plan for railway construction, while at other times the promoter himself planned it. The typical concession granted an implicit monopoly on transport in the area served by the new line, and involved exemptions from customs duties for materials imported for its construction. It also frequently happened that the government guaranteed interest on the capital invested on the line for a certain number of years, so that if the profits on the line did not reach the rate of return laid down, the government paid the difference. Finally, the concession frequently included the granting of large areas of land adjacent to the line, which the holder of the concession could settle, in order to increase traffic on the new line. Under the first formula, the promoters, bank agents and con-

²⁵Marín Vicuña, *Política ferroviaria de la América*, *op. cit.*, p. 61.

struction contractors had their profits practically guaranteed, and returns on the capital of the investors—generally European—were assured for 20, 40 or more years, under the State guarantee of minimum interest on the capital.

The second manner of approaching the construction of national railways, and one which was applied in particular in the Pacific countries, was direct investment by the State, frequently financed by loans obtained by the governments in Europe. Under this formula, the government undertook the construction of the new line and operated it on its completion, although subsequent problems occasionally made it necessary to sell or lease the line to a private company for operation.

The third formula was less widely used in Latin America, and was applied almost exclusively in the case of what might be called industrial railways serving mineral deposits. In these cases, concessions were granted to private companies for the construction and operation of railways, but without State guarantees relating to capital invested or other important subsidies; the entire risk in construction was borne by the private company, and it would be correct to say that the existence of this type of railway was due to private initiative.

Against this general background on national railways, we will now examine the international sections identified above. Of particular interest in this study is the role of the governments and the financial arrangements and distribution of risk between the governments and the private companies. The basic objective is to determine how far the section in question is the result of economic co-operation among Latin American countries.

*a) International sections constructed by
and at the risk of capitalists
from outside the continent*

None of the 13 international railway sections identified in the previous part could be described as primarily the result of an initiative by capitalists from outside the continent with full acceptance of the risks involved. All the sections owe their existence to subsidies granted by the governments to the holders of concessions or to

direct efforts by Latin American governments and individuals.

The sole case which might be considered an exception was the change of gauge from 0.76 m to 1 m effected by the Compañía Antofagasta-Bolivia on the Antofagasta-Uyuni section between 1926 and 1928, in order to link it with the Bolivian and Chilean systems.^{26, 27}

*(b) International sections constructed by
concession holders from outside the
continent which were given incentives
by Latin American governments*

The international section from Los Andes to Mendoza, which is part of the transcontinental route from Valparaíso to Buenos Aires, is a good example of a section constructed by concession holders who received substantial guarantees from the two countries involved, Chile and Argentina.²⁸ In 1872, the Anglo-Chilean brothers Mateo and Juan Clark secured from the Argentine government a concession for the construction of a railway from Buenos Aires to the Chilean border, with interest guaranteed at 7% for 20 years. Two years later, the Chilean government authorized the construction of the section in Chilean territory, but as a result of certain financial problems the start of work was postponed. In 1882 the Ferrocarril de Buenos Aires al Pacífico was set up in London, acquired the Clark brothers' concession for the section between Buenos Aires and Mendoza, and initiated the construction work; the first locomotive reached Mendoza from Buenos Aires in 1887. In the same year the Compañía del Transandino Argentino began construction from Mendoza to the Chilean border, reaching Las Cuevas in 1903.

²⁶Brian Fawcett, *Railways of the Andes* (London, Allen and Unwin, 1963), p. 119.

²⁷*Los ferrocarriles internacionales de Sudamérica y la integración económica regional* (United Nations publication, Sales N.º S.72.II.G.4), p. 132.

²⁸Zalduendo, *op. cit.*; Fawcett, *op. cit.*; United Nations (CEPAL), *Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*; INTAL/CEPAL, *Servicios de transporte terrestre...*, (E/CEPAL/1007), *op. cit.*; R. Simón, M. Araya and J. S. Contreras, *Informe sobre la situación del Ferrocarril Transandino Chileno* (Santiago, Chile, Imp. Nascimento, 1927).

On the Chilean side, the Clark brothers encountered various financial problems, and the Law of 1874 was replaced in 1887 by a more favourable law, which made it possible for work to begin in 1889. Nevertheless, despite new changes in the concession in 1893 and 1895, a combination of political and financial problems in Chile prevented the line from advancing beyond El Salto del Soldado. Finally, a new law in 1903 granted guaranteed interest of 5% for 20 years on a capital of £ 1,485,000 and, with the reorganization of the company holding the concession, which was converted into the Transandine Construction Company Ltd., the work continued and the link was made with the Argentine section in 1910.

The international section between Monte Caseros, Argentina, and Cacequí, Brazil, is another example of an international railway whose construction was due to subsidies granted to the concession holders by the governments concerned. Monte Caseros was selected as the starting point of the international section to Brazil because the section between Concordia and Monte Caseros had been established in 1875 as an isolated railway designed to avoid the waterfalls which impede navigation on the river Uruguay. The initial concession for the line between Concordia and Monte Caseros was authorized in 1864 in a law passed by the Argentine government, and it was granted in 1869 to an Argentine citizen, who sold it to a company established in London, the *Compañía Ferrocarril del Este*. The concession enjoyed a State guarantee of 7% a year for 40 years.²⁹

The section between Monte Caseros and Paso de Los Libres, where there is a connexion with the Brazilian section between Cacequí and Uruguaiana, is part of the concession granted to Juan Clark by the Argentine Government in 1872 for the construction of an 812-km railway from Monte Caseros to Corrientes and Posadas. The concession included a State guarantee of 6% for 20 years. In order to carry out the undertaking the *Compañía Ferrocarril Noreste Argentino* was set up in London, and in 1890 completed an initial 65-km section. According

to indirect information, the section to Paso de Los Libres was completed between 1890 and 1900, while the extension to Posadas, opposite Encarnación, in Paraguay, was completed between 1900 and 1910.³⁰ Later the *Compañía Ferrocarril del Este* and the *Compañía Ferrocarril Noreste Argentino* were consolidated into a single company, which took the name of the latter.³¹

In Brazil, the section between Uruguaiana and Cacequí is part of the line from Porto Alegre to Uruguaiana, construction of which was decided upon by the Imperial Government of Brazil in 1873.³² The nature of the initial concession is not clear from the materials available in the CEPAL Library, but it is to be supposed that it included a State guarantee of a certain level of interest on the capital invested.

In 1898 the Federal Government of Brazil leased the line between Porto Alegre and Cacequí to Affonso Spée, who in turn transferred the concession to the *Compagnie Auxiliaire des Chemins de Fer du Brésil*, a Belgian company authorized—also in 1898—to operate in Brazil. In 1905 the *Compagnie Auxiliaire* received another concession to complete the construction of the section Cacequí and Uruguaiana,³³ which it did in 1910. In the same year Percival Farquhar purchased 70% of the shares in the *Compagnie Auxiliaire*,³⁴ while in 1912 he acquired control of the *Compañía Ferrocarril Noreste Argentino*.³⁵ Nevertheless, only in the 1940s was the dual-gauge international railway bridge between Uruguaiana and Paso de Los Libres completed.³⁶

A third example of an international section constructed as a result of subsidies paid to the concession holders is the section which links Brazil and Uruguay through Santa Anna do Livramento/Rivera. It is easy to define the

²⁹Zaldueño, *op. cit.*, pp. 335-336 and 577.

³⁰Scalabrini Ortiz, *op. cit.*, p. 339.

³¹*Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 136.

³²Frederick A. Molitor, *Report on the Railway Properties in Southern Brazil Leased, Owned or Controlled by the Brazil Railway Company* (New York, John Ward & Son, 1915), pp. 60-61.

³³Gauld, *op. cit.*, p. 178.

³⁴Hanson, *op. cit.*, p. 321.

³⁵*Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 137.

²⁹Raúl Scalabrini Ortiz, *Historia de los ferrocarriles argentinos*, 4th ed. (Buenos Aires, Ed. Plus Ultra, 1964), pp. 341-342.

international section on the Brazilian side, since it is a branch which leaves the line between Porto Alegre and Uruguaiana at a point named Entroncamento, near Cacequí. The concession obtained by the Compagnie Auxiliaire in 1905, whose exact terms are not known, provided for the construction of this branch to be completed.³⁷

On the Uruguayan side, in contrast, it is more difficult to define the international section since this forms part of a line which leaves Montevideo and continues directly northwards to Rivera, so that it is impossible to know which section was constructed only to carry national traffic and which was constructed to create a link with the Brazilian railway system. The Ferrocarril Central was organized in Uruguay in 1863, and in 1869 the section between Montevideo and Las Piedras was opened, but in 1876, because of financial difficulties, the Compañía Ferrocarril Central del Uruguay was set up in London to operate the Montevideo-Durazno concession. In 1884, law N.º 1751 on railways routes guaranteed companies holding concessions interest of 7% a year for forty years. Under this law, the Ferrocarril Central extended its line to Río Negro, which it reached in 1886. Later, the line was extended to Rivera, a sector which the Ferrocarril Central was granted a concession to operate in perpetuity.^{38, 39, 40}

Although there is no doubt that the Government of Uruguay provided subsidies for the construction of the international section, identification of the length of the section is arbitrary, since it is not possible to find convincing reasons for deciding on one cut-off point rather than another. For the purpose of this study Tacuarembó, a livestock centre, has been fixed as the end of the Tacuarembó-Entroncamento section.

In 1912 Percival Farquhar acquired control of the Ferrocarril Central de Uruguay and built a

railway bridge between Livramento and Rivera.⁴¹

(c) International sections constructed directly by governments

The international section between Augusta Victoria, Chile and Salta, Argentina is perhaps the best example of a case where two Governments decide on the construction of an international railway as a means of economic co-operation, with each country directly financing its share in the total costs. This section was first officially approved in Argentina in 1896, when a commission was appointed to study the route. Originally both Governments had hoped to construct the section by means of concessions, and to that end in 1907 they separately authorized Emilio Carrasco to link Salta and Antofagasta using the Huaytiquina pass. However, Carrasco's efforts were unsuccessful, and his concession on the Argentine side lapsed in 1914.⁴² When his concession in Chile was to be renewed for the third time, a serious conflict rose between the Executive and the Congress of Chile in 1912, when "there suddenly arose great alarm among the livestock fatteners and producer of fodder and meal, who were alarmed and afraid of losing the northern market for their products..."⁴³

Following continued local pressure by the Salta producers and the Antofagasta mineral products consumers, the decision to construct the section was formalized in an agreement signed in 1922 by Ernesto Barros Jarpa, Chilean Minister for Foreign Affairs, and Carlos M. Noel, Argentine plenipotentiary. The agreement provided for the simultaneous construction of the Antofagasta-Salta connexion and another in the south, between Lonquimay, Chile and Zapala, Argentina, thus reducing the opposition of the Chilean producers in the south to the connexion in the north. In the same

³⁷Molitor, *op. cit.*, p. 61.

³⁸Zalduendo, *op. cit.*, p. 415.

³⁹Joseph L. Fitzmaurice and Hardy Osgood, *The Railways of Uruguay* (Washington, U.S. Department of Commerce, [1942]), p. 4.

⁴⁰Uruguay. Administración de Ferrocarriles del Estado y Comisión de Inversiones y Desarrollo Económico, *Diagnóstico del transporte ferroviario* (Montevideo, 1966), p. 23.

⁴¹*Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 136.

⁴²*Proyectos multinacionales de infraestructura física. Fórmulas jurídico-administrativas* (Buenos Aires, Instituto para la Integración de América Latina, 1970) pp. 222-223.

⁴³Marín Vicuña, *Política ferroviaria de la América*, *op. cit.*, p. 63.

year a protocol was signed which laid down a policy for the fixing of railway tariffs.⁴⁴

In 1929 a joint Argentine-Chilean commission specified the technical characteristics of the section, but construction was slow. In 1943, under the Fernández-Storni Agreement, the two countries reaffirmed their agreement to speed up the construction work. Finally, government agencies completed the construction using the Socompa pass—some 200 km south of the Huaytiquina pass—and starting on the Chilean side from Augusta Victoria, 152 km from Antofagasta on the line belonging to the Compañía Antofagasta a Bolivia. The line was opened in February 1948.⁴⁵

The second case of an international section constructed by two governments working together is the section between Atocha, Bolivia and Jujuy, Argentina. On the Argentine side, a concession was granted in 1889 to Julio Achával y Cía., for the construction of the section between Jujuy and La Quiaca, but the concession lapsed in 1894.⁴⁶ Information available in CEPAL indicates that the section was constructed by the Argentine State as part of Ferrocarril Central Norte Argentino, but it does not indicate the date of its completion.

On the Bolivian side, construction by the State of the section between Villazón and Tupiza began in 1912 and ended in 1924. Construction of the section between Tupiza and Atocha, also by the State, lasted from 1920 to 1925. Meanwhile, the section between Atocha and Uyuni had already been completed in 1913, by the Ferrocarril Antofagasta a Bolivia.⁴⁷

The category of sections constructed directly by the State also includes the section between Juliaca, Peru and La Paz, although this is a special case. On the Peruvian side, the line from Mollendo to Juliaca, built by the Peruvian Government and completed in 1876,⁴⁸ has not been defined as an international section, since the line continues to Cuzco and would probably have been constructed even if it had not been

possible to use it for international traffic. This line passed in 1890 to the Peruvian Corporation, a company set up in London by the holders of the unpaid bonds of the Peruvian State.⁴⁹

On the Bolivian side, construction of the section from Guaqui to La Paz was begun in 1901, with financing from the Departamento de La Paz. When national finance ran out, the work continued using a loan from the Peruvian Corporation, reaching El Alto in 1903. In 1904 the section was leased to the Peruvian Corporation, which completed construction all the way to La Paz. In 1910, the section was sold to the Peruvian Corporation.⁵⁰

(d) *International sections constructed with financing from another Latin American country*

Of particular interest for the present study from the viewpoint of economic co-operation among developing countries are those international sections which were constructed as a result of a contribution made by one Latin American country to another.⁵¹ The decision of two countries to construct a railway to link them is in itself an example of economic co-operation, but if in addition one of the countries provides financial assistance to the other, this gives it a special character. In 7 of the 13 international sections examined here, one of the countries co-operated in financing construction in the other.

In chronological order, the first case is the international section between Antofagasta, Chile and Uyuni, Bolivia. Construction began in Chile in 1872, when the Compañía de Salitres y Ferrocarril de Antofagasta, a company formed by Chilean shareholders, obtained a concession for the construction of a railway to the interior and for exploitation of the saltpetre deposits. In 1882, when the railway had reached a point 150 km from Antofagasta, the Chilean Government authorized its extension to the Bolivian border,

⁴⁴*Ibid.*, p. 65.

⁴⁵*Los ferrocarriles internacionales de Sudamérica...*, op. cit., p. 140.

⁴⁶Zalduendo, op. cit., p. 580.

⁴⁷*Los ferrocarriles internacionales de Sudamérica...*, op. cit., pp. 138-139.

⁴⁸*Ibid.*, p. 132.

⁴⁹C. Reginald Enock, *Peru* (London, T. Fisher Unwin, 1908), pp. 104-105.

⁵⁰*Los ferrocarriles internacionales de Sudamérica...*, op. cit., pp. 132-133.

⁵¹This does not mean that economic co-operation among developing countries should be identified with concessional assistance; co-operation should essentially be beneficial to both parties.

on condition that it provided a public service. The Bolivian Compañía Huanchaca co-operated with the Compañía de Salitres y Ferrocarril de Antofagasta in financing the extension to the mines in the interior of Bolivia, and in 1888 the Bolivian Government authorized an extension to Uyuni, which was completed in 1889, a year after the formation in London of the Antofagasta (Chile) and Bolivia Railway Co. Ltd. This company bought the Chilean section and the Compañía Huanchaca concession, which included the extension of the line to Oruro with State-guaranteed interest of 6%.⁵²

Since the Antofagasta-Uyuni section was originally a saltpetre railway, and currently carries heavy traffic from the Chuquibambilla copper mine in Chile, objections may be made to its inclusion as an international section of the total length of the line between Antofagasta and Ollagüe. Nevertheless, it is felt that the enormous effort required to convert the original gauge of 0.76 m to 1 m between Antofagasta and Uyuni constitutes a justification. This conversion, carried out between 1926 and 1928, in addition to movement of the rails themselves over 614 km, involved the modification of the bogies of 61 locomotives, 103 passenger coaches and 2,140 wagons in the Mejillones workshops, and was carried out without any interruption to traffic, except for six days in July 1928.⁵³

The international railway section between Arica, Chile and Viacha, Bolivia was constructed by Chile in pursuance of the 1904 Treaty of Peace and Friendship between Chile and Bolivia, the pertinent section of which reads:

"Art. 3. In order to make closer the political and trade relations of the two Republics, the High Contracting Parties agree to link the Port of Arica with El Alto de La Paz by a railway, which will be constructed by the Government of Chile at its expense, within a period of one year from the ratification of the present Treaty.

"Ownership of the Bolivian section of this

railway will be transferred to Bolivia on the expiration of a period of fifteen years from the day on which it is totally completed.

"To the same end, Chile undertakes to pay the sums which may be incurred by Bolivia for guarantees of up to 5% on the capital invested in the following railways, construction of which may be undertaken within a period of thirty years: Uyuni to Potosí; Oruro to La Paz; Oruro to Santa Cruz, *via* Cochabamba; La Paz to the Beni region; and Potosí to Santa Cruz, *via* Sucre and Lagunillas.

"This undertaking shall not involve for Chile expenditure of more than one hundred thousand pounds sterling a year, nor more than a total of one million seven hundred thousand pounds sterling, established as the maximum which Chile will pay for the construction of the Bolivian section of the railway from Arica to El Alto de La Paz and for the guarantees mentioned above, and it shall expire and be null and void on completion of the period of thirty years indicated above."⁵⁴

Construction was initially entrusted to the Sindicato de Obras Públicas de Chile, a company formed using national capital, for the sum of £ 2,152,000. When this company could not fulfil the contract, the work was entrusted in 1909 to Sir John Jackson (Chile), Limited, of London, represented in Chile by Mateo Clark, for £ 2,750,000 - £ 1,645,000 for the Chilean section and £ 1,105,000 for the Bolivian section. The railway was opened in 1913.⁵⁵

Although the international section of the line between Paso de Los Libres, Argentina and Asunción, Paraguay, has some characteristics of a section constructed by concession holders from outside the continent with financial support from Latin American governments, there is one element which justifies its inclusion in the present category. Paso de Los Libres has been fixed as the end of the section on the Argentine side, on the assumption that the extension between that point and Posadas was made principally with the aim of linking up with the Paraguayan railway. The history of the cons-

⁵²Fawcett, *op. cit.*, pp. 112-113; *Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, pp. 131-132; Humberto Aldazosa Villamil, *Los ferrocarriles de Bolivia* (La Paz, mimeo, 1977), p. 2; Francisco A. Encina and Leopoldo Castedo, *Resumen de la historia de Chile* (Santiago, Chile, Zig-Zag, 1970), pp. 1408-1414.

⁵³Fawcett, *op. cit.*, pp. 118-121.

⁵⁴Alberto Decombe, *Historia del ferrocarril de Arica a La Paz*, (Santiago, Chile, Lib. e Imp. de Artes y Letras, 1913), p. 9.

⁵⁵*Ibid.*, pp. 87 and 112.

truction of the section has already been examined in the course of the description of the section from Monte Caseros, Argentina to Cacequí, Brazil.

On the Paraguayan side, the section between Asunción and Encarnación began as the Ferrocarril del Estado. In 1861 the first section to Trinidad (6.4 km) was opened, and in 1864 the line reached Paraguairí, 72 km from Asunción.⁵⁶

The railway was subsequently sold to Luis Patri, a Paraguayan, who repaired the damage caused by the War of the Triple Alliance, and later sold the railway to the Government in 1886, retaining a contract for the extension of the line to Villarrica. However, construction was held up by the absence of State financing.⁵⁷

In 1889 the Paraguay Central Railway Company Limited was established in London and purchased the existing line, agreeing with the Government to extend the line to Encarnación with a guarantee of 6% interest.⁵⁸ In the same year the first train covered the 150 km between Asunción and Villarrica.⁵⁹ The new company began construction in Encarnación, but in 1891 work stopped again at 250 km because of lack of finance, giving rise to litigation which lasted for 15 years, and ended only in 1907 with the reorganization of the company and a new agreement with the Government which made it possible to restart construction.⁶⁰ Finally, in 1913, when Percival Farquhar controlled the Ferrocarril Central de Paraguay, the line reached Pacú-Cúa, beside Encarnación, where the rolling-stock crosses the river Paraná on a ferry to continue from Posadas to Buenos Aires. Farquhar himself was on the train which inaugurated the direct service.⁶¹

This short outline of the history of the section from Paso de los Libres to Asunción indicates that the section should be classified in the category of railways links constructed by concession holders from outside the continent with support from the State. One might also wonder why the final point of the Paraguayan section is Asunción instead of Villarrica, but there are reasons for this.

Towards the end of the last century, during the litigation between the British Company and the Government of Paraguay, Argentine capitalists (including shareholders in the Ferrocarril Noreste Argentino, which runs to Posadas) acquired shares in the Ferrocarril Central de Paraguay. In 1906 the Argentine shareholders had 85% of the shares, while the bonds remained largely in British, French and North American hands.⁶² Furthermore, the Paraguayan railway was built with a broad gauge of 1.676 m, which would have prevented a connexion to Buenos Aires without transshipments. In 1911-1912 the gauge was changed to 1.435 m, thanks to a contribution from the Government of Argentina of £ 380,000, in exchange for deferred bonds worth £ 220,000.⁶³

The international section between Treinta y Tres, Uruguay and Basilio, Brazil is a particularly clear example of economic co-operation between developing countries. A 1918 agreement between Brazil and Uruguay, modified by another in 1928, established Uruguay's remaining debt to Brazil in respect of the War of the Triple Alliance and laid down that it should be applied to the construction of an international railway section between Treinta y Tres and Basilio. The first point was the northern terminal of a branch of the Ferrocarril Central del Uruguay, and the second a point on the Brazilian line between Cacequí and Río Grande. The construction work, including the Mauá bridge on the river Yaguarón between Río Branco, Uruguay and Jaguarão, Brazil, was completed in 1931.⁶⁴

⁵⁶ *Estudio sobre el Ferrocarril Central del Paraguay*, Secretaría Técnica de Planificación del Desarrollo Económico y Social, (Asunción, 1964), (mimeo), p. 1.

⁵⁷ Gaylord Warren Harris, "The Paraguay Central Railway, 1856-1889", *Inter-American Economic Affairs* (Washington), Vol. 20, N.º 4, (Spring 1967), pp. 15-17.

⁵⁸ *Ibid.*, pp. 20-21.

⁵⁹ *Estudio sobre el Ferrocarril Central del Paraguay*, *op. cit.*, p. 2.

⁶⁰ *Ibid.*, p. 2; Gaylord Warren Harris, "The Paraguay Central Railway, 1889-1907", *Inter-American Economic Affairs* (Washington), Vol. 21, N.º 1, p. 35.

⁶¹ Gauld, *op. cit.*, p. 241; Hanson, *op. cit.*, p. 322.

⁶² Harris, "The Paraguay Central Railway, 1889-1907", *op. cit.*, p. 40.

⁶³ *Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 135.

⁶⁴ *Ibid.*, p. 137.

The Brazilian part of the international section between Campo Grande, Brazil and Santa Cruz, Bolivia was initially conceived as part of the feeder line which would link the State of Matto Grosso with the coast of the country. The 1890 Plan de Viação Férrea e Fluvial (Railway and River Transport Plan) laid down special incentives for the constructions of railways to Corumbá and other distant points in the interior, including a transport monopoly for 60 years, guaranteed interest of 6% for 30 years and land grants 20 km wide along the entire length of the lines.⁶⁵ At all events, when construction from Baurú was finally commenced in 1905, there was probably a clear intention to build a railway link with Bolivia: indeed, the extension from Campo Grande to Corumbá was only justifiable with that in mind. Construction was slow, and only in 1926 was the bridge over the river Paraná completed, while the bridge over the river Paraguay was not finished until 1947.⁶⁶

Construction on the Bolivian side was financed by the Government of Brazil. The 1903 Treaty of Petrópolis obliged Brazil to construct at its own expense the Madeira-Mamoré railway, with a branch to Villa Bella, a Bolivian village on the river Mamoré, and to pay Bolivia an indemnity of £2 million.⁶⁷ By the Flores-Pacheco Protocol of 1925, which apparently was not ratified, Brazil agreed to use this indemnity to construct the section from Santa Cruz to Corumbá, provided that Bolivia did not delay construction of the section between Cochabamba and Santa Cruz.⁶⁸ In April 1928, using a loan of US\$ 6 million from Dillon Read & Co., the Government of Bolivia engaged the firm of Kennedy & Carey, of New York, to reconstruct the section from Cochabamba to Cliza and extend the line to Aiquile, 220 km from Cochabamba towards Santa Cruz.⁶⁹ Under the Decem-

ber 1928 treaty between Bolivia and Brazil, it was agreed that Brazil would not construct the branch to Villa Bella, but would undertake to assist in financing the section from Cochabamba to Santa Cruz.⁷⁰ Nevertheless, construction did not continue beyond Aiquile.

In 1938 the Treaty on Railway Links between the two countries stipulated that Brazil would devote half the indemnity laid down in the Treaty of Petrópolis to the construction of the section between Corumbá and Santa Cruz, and that it would lend Bolivia the difference between that sum and the actual cost of construction, to be repaid by Bolivia over 20 years following the completion of the work. Construction began in Corumbá in 1939, and in 1954 the line reached Santa Cruz,⁷¹ although the bridge over the Río Grande in Bolivia was completed only in 1958. In 1964, under a further protocol, the two countries agreed that Bolivia's debt would be invested, by common agreement, in development projects in eastern Bolivia which could benefit from the presence of the railway.⁷²

The international section from Embarcación, Argentina to Santa Cruz, Bolivia originated in a 1906 agreement between the two countries which provided for an extension of the line of the Ferrocarril Central Norte Argentina to Yacuiba and over a further 100 km in Bolivia towards Santa Cruz, and also provided for a system of guarantees for construction up to Santa Cruz.⁷³ Although the line reached the border, implementation of the agreement within Bolivia was not successful.

The possibility of extending the railway to Santa Cruz arose again in 1922, when another agreement between Bolivia and Argentina was signed in La Paz stipulating that the Argentine Government would construct the line without requiring immediate expenditure by the Bolivian Government. In fact, the agreement granted a generous concession to Argentina for

⁶⁵Zalduendo, *op. cit.*, p. 215.

⁶⁶*Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 141.

⁶⁷John Henry Merryman, *The International Agreements of Bolivia as they Relate to Transportation. Prepared in Conjunction with the Bolivia Transport Study* (La Paz, Stanford Research Institute, 1968), p. 14.

⁶⁸Marín Vicuña, *Sobre ferrocarriles internacionales*, *op. cit.*, pp. 17-18.

⁶⁹"Bolivia —Ministerio de Fomento— Contrato de

construcción", *Boletín de la Sociedad de Ingenieros de Bolivia* (La Paz), Vol. 4, N.º 11 (December 1928), p. 57.

⁷⁰Merryman, *op. cit.*, p. 16.

⁷¹*Ibid.*, p. 16.

⁷²*Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 141.

⁷³*Ibid.*, p. 139.

the operation of the railway on its completion, although article 4 stated that:

"The Government of Bolivia may at any time acquire ownership of the line, once it and its branches have been completed, by paying the total value of its cost and interest at 6% a year on the capital invested; however, until such time as this value has been repaid, the Argentine Government will be responsible for the administration and management of the line, on the same terms as those which would apply to a private company, without prejudice to the rights inherent in Bolivian sovereignty."⁷⁴

However, the agreement was not ratified.

Finally, under the Preliminary Railway Convention of 1937, a joint commission was set up to carry out engineering studies on the extension of a line to Santa Cruz and branch to Sucre, while under another convention in 1940, Argentina agreed to advance funds for the section between Yacuiba and Villa Montes. These agreements were consolidated in 1941 in the Treaty on Railway Links, which, in addition to establishing an Argentine-Bolivian Joint Railway Commission, to be responsible for all the railway works, laid down the terms on which Bolivia would repay with petroleum or cash the credits granted by Argentina.⁷⁵

Construction of the line began in 1944, and in 1957 the line reached Santa Cruz, although in

a temporary state in some sections. However, in 1958 a flood destroyed the bridge over the river Parapetí, and it was necessary to change part of the route. In 1966 regular service was initiated between Santa Cruz and Buenos Aires, and in 1967 the line was officially handed over to the Government of Bolivia.⁷⁶ When construction to Santa Cruz was nearly completed, both countries agreed to extend the line to the town of Trinidad in the Amazonian region. At present the railway reaches the river Yapacaní, some 204 km from Santa Cruz.

Construction of the Salto Grande dam on the river Uruguay made possible an international section between Salto, Uruguay and Concordia, Argentina, since this enormous construction, costing some US\$ 1 billion, includes an international road and railway over the dam. The work began in 1974, and the opening of the railway section is planned for 1979; this will make it possible to integrate the Paraguayan railway with that of Uruguay *via* the Argentine line between Posadas and Concordia. Although a substantial part of the cost of the dam is being financed with a loan from the Inter-American Development Bank (IDB) and suppliers' credits, the Argentine Government is financing the local currency costs, which will be repaid by Uruguay in the future in the form of supplies of electricity.⁷⁷

V

Administration of the international sections

As can be seen from the preceding section, it was the South American governments themselves which promoted or constructed the international railway links, bearing the financial risks and, sometimes, financing construction work in other countries. This approach of

economic co-operation reflected a clear idea of the role which could be played by an international railway and the benefits which its construction brought with it. The following table indicates the two principal purposes of the various sections.

⁷⁴Marín Vicuña, *Política ferroviaria de la América*, op. cit., pp. 122-128.

⁷⁵Merryman, op. cit., p. 7.

⁷⁶*Los ferrocarriles internacionales de Sudamérica...*, op. cit., p. 139; Merryman, op. cit., p. 7; Comisión Mixta Ferroviaria Argentina Boliviana, *Construcción Ferrocarril*

Santa Cruz-Trinidad. Informe de la gestión 1974-1975, p. 43.

⁷⁷Uruguay - Administración de los Ferrocarriles del Estado, "Las interconexiones ferroviarias sobre el Río Uruguay", *Revista ALAF*, Vol. 1, N.º 21 (April-June 1976).

PRINCIPAL PURPOSES OF THE INTERNATIONAL RAILWAY SECTIONS

International section	To provide access to overseas ports	To stimulate regional trade
Antofagasta-Uyuni	X	
Juliaca-La Paz	X	
Los Andes-Mendoza	X	X
Monte Caseros-Cacequí		X
Tacuarembó-Entroncamento		X
Arica-Viacha	X	
Asunción-Paso de los Libres	X	X
Jujuy-Atocha		X
Treinta y Tres-Basilio		X
Augusta Victoria-Salta	X	X
Campo Grande-Santa Cruz	X	X
Embarcación-Santa Cruz	X	X
Salto-Concordia	X	X

Regrettably, after major efforts to provide suitable physical infrastructure to achieve the purposes set out above, two fundamental errors were committed in the administration of the sections, which often made it impossible to obtain the hoped-for benefits. Firstly, each part of the railway was allowed to be administered independently, with little commercial and operational co-ordination; secondly, the directors and principal staff of the private companies holding concessions were allowed to centralize the most important decisions abroad, so that local power to take decisions remained very limited.

Dividing the administration of international sections between two companies has especially serious consequences, since each side of these sections is often, in turn, an unimportant branch within the national railway network, and the border connexion itself is often located in an inhospitable place. Operational and commercial co-ordination, in these circumstances, is difficult, and is generally carried out at a middle or low level in the hierarchy, so that as a result it does not reflect a decision by the senior management of the companies to use the railway as a fundamental tool

for expanding international trade and economic integration.

Without wishing to embark on an analysis of the particular cases of each international section, it is worth while giving a few illustrations. The railway between Arica and La Paz was administered as a single company for 15 years by Chile until, under the 1904 Treaty, ownership and administration of the Bolivian sectors was transferred to Bolivia in 1928. Although the purpose of the railway is to give Bolivian imports and exports access to the port of Arica, this fragmentation of the administration led to the creation of two classifications of freight and the separate payment of freight charges in each country.

In the case of the railway between Augusta Victoria and Salta, the Chilean side was administered by the Antofagasta to Bolivia railway between 1948 and 1965. The agreement between the company and the Government of Chile stipulated that FCAB wagons would not enter Argentina, which made it necessary to transship the freight at Socompa on the border. The Additional Protocol on Zonal Trade, signed by Argentina and Chile in 1957, set up a Joint Commission whose functions would include

the fixing of tariffs, "bearing in mind the purposes of developing trade and the mutual supply of goods for which it was constructed", the exchange of rolling-stock and the general co-ordination of both sections; however, this commission never met.⁷⁸

Earlier in this study reference was made to the efforts of Percival Farquhar to consolidate into a single system the railways in southern Brazil, Uruguay, Paraguay, Chile and Argentina. Farquhar grasped very clearly the importance of co-ordinating international railway operations and services and establishing a commercial policy which would encourage traffic. After securing control of the *Compagnie Auxiliaire de Chemins de Fer du Brésil*, which had connexions with Argentina and Uruguay, he cut tariffs by 15% with the aim of stimulating traffic,⁷⁹ probably partly because it was the Buenos Aires and Montevideo markets for timber which would make his large sawmills in southern Brazil profitable. As noted in the previous section, it was Farquhar who in 1912 built the bridge between Livramento, Brazil and Rivera, Uruguay. Nevertheless, when in 1915 Frederick Molitor, adviser to the receiver of the Brazil Railway Company after its bankruptcy, prepared his report on the situation of the railway, he wrote as follows concerning the Livramento-Rivera connexion:

"In consignments destined to Uruguay, the shipper bills to Sant'Anna and is obliged to employ a broker there to attend to the rebilling over the Uruguay railways. Facilities for transfer exist between these two railways of different gauge, but the stations are four and a half miles apart. There is a switching rate between them which amounts to about US\$ 20.00 per car at the present rate of exchange. In consequence of this prohibitive rate, lumber is unloaded on the sidings of the *Auxiliaire* at Sant'Anna and hauled piecemeal to Rivera over a wagon road only three miles long, then reloaded on the Uruguay railway cars - all at half the cost of rail transfer.

"Despite the fact that this connexion with the Uruguay Railway, controlled by the Brazil

Railway Company, has been in existence for a number of years, no effort seems to have been made even to assist through traffic that is seeking to use the lines. Thus, the lack of co-ordination before mentioned extends to interline shipments, and until this is remedied the Brazil Railway Company cannot hope to increase its earnings. Such local business as the Company enjoys is almost forced upon it, and interline business is effectively prevented."⁸⁰

Thus, in this case not even the visionary Farquhar managed to introduce commercial procedures and practices which would revitalize the international railway, even though he controlled the railways on both sides of the border.

It was mentioned above, on the subject of the section between Concordia and Monte Caseros, that the concession granted to an Argentine in 1869 by the Government of that country was immediately sold to the *Compañía Ferrocarril del Este*, a British firm. The sale of the concession provoked objections in Argentina, and in 1871, when the *Ferrocarril del Este* requested approval of its articles of incorporation, the Procurator General prophetically pointed out in his report the drawbacks of administrative centralization outside the country:

"The transfer substantially alters the terms of the concession. The concession was made to a person resident in the Republic and domiciled in Buenos Aires. Today the contractor is a private company formed in London, and it will set up a very expensive board of directors in London, which will prepare the accounts there in pounds and which will even have to pay the British Government tax on income from a line situated in the Argentine Republic. The inevitable result will be questions and arguments similar to those already arising today between the Government and the *Compañía del Central Argentino*. The considerable salaries which the directors award themselves, although in reality they direct nothing, because it is impossible to watch over the administration from 2,000 leagues away; the unlawful tax paid to the British Government and discounts in the

⁷⁸*Proyectos multinacionales de infraestructura física...*, op. cit., pp. 224-225

⁷⁹Hanson, op. cit., p. 317.

⁸⁰Molitor, op. cit., p. 263.

remitting and exchange of money, which absorb a large part of the proceeds and which the Government will have to offset; and also the fact that this situation will place Argentines who wish to buy shares in the Company in an intolerable position.”⁸¹

Nevertheless, the articles were approved.

Perhaps the clearest example of the results of dividing the administration of an international section between two companies, and allowing them to maintain residence abroad, is that of the trans-Andean railway between Los Andes, Chile, and Mendoza, Argentina. The fact that this is a classic case justifies a rather detailed description of how it was operated in the initial period.

Section IV above contained an examination of the financing and construction of the railway, and the reasons which led to the setting up of two companies separately answerable to the Governments of Argentina and Chile. What happened after the opening of the line in 1910 is very well summed up by the Chilean engineer Santiago Marín Vicuña, who wrote in 1927.

“Something anomalous, which should be noted and explained, has occurred in the operation of this line: the expected economic benefits for our country have been relatively small, if they are compared with the monetary sacrifices which the State has been obliged to bear.

“This was due to the undesirable and unacceptable fact that the Chilean and Argentine sections constitute separate companies which—though this may seem paradoxical—had opposing interests, since once the administration of the latter section had been entrusted to the railway from Buenos Aires to the Pacific, the financial interests of this company lay in *hampering trans-Andean traffic to Chile*.

“As a result, because of a curious and irritating tariff-fixing system, the products from Mendoza province had to travel 1,043 km to Buenos Aires, instead of coming only 387 km to Valparaíso. And to make this imposition even more flagrant, there were goods with a higher tariff between Los Andes and Mendoza than between

Los Andes and Buenos Aires, so that a partial journey cost more than the whole!”⁸²

Obviously, this had not been the intention of the two Governments when granting the concessions and guaranteeing interest on the capital invested. Accordingly, after the line had been opened, Argentina and Chile appointed a commission which met in 1911 to study a tariff structure which would stimulate international traffic and to arrange a fair distribution of freight between the two Andean railway companies. On the completion of their meetings the delegates proposed the establishment of a Standing International Commission to study and resolve the problems of the trans-Andean railway. The results of the 1911 meetings were summarized in the *Informe sobre la situación del Ferrocarril Transandino Chileno*, ordered by the Chilean Minister of Communications in 1927, in the following words:

“The result of the 1911 conferences may be outlined as follows: The question of splitting the freight between the companies remained pending. The trial tariffs were not put into practice, and the Standing International Commission was never appointed. As a result, each company continued to charge the tariffs which it had already established...”⁸³

The problem of drawing up tariffs which suited both countries remained unsolved for the next six years, until it was agreed to submit the question to the joint arbitration of the Governments of Argentina and Chile, with the appointment of a commission which met in 1917. Nevertheless, the only issue on which a decision was sought was that of the splitting of the freight between Los Andes and Mendoza, and the level of the tariff was not brought up. The arbitration commission drew up a formula based on the work necessary to pull the train, which calculated the compensated distance of ascent in each section and applied the real distance in the case of a descent. As the compensated distance of ascent was calculated at 940 km (185 real km) in the Argentine section and 780 km (71 real km) in the Chilean section, the splitting formula was:

⁸²Marín Vicuña, *Política ferroviaria de la América*, *op. cit.*, p. 50.

⁸³Simón and others, *op. cit.*, p. 31.

⁸¹Scalabrini Ortiz, *op. cit.*, pp. 341-342.

$$\begin{array}{lcl} \text{Argentine trans-Andean quota} & = & 1120 Q + 940 Q_a + 180 Q_c \\ \text{Chilean trans-Andean quota} & & 850 Q + 780 Q_c + 70 Q_a \end{array}$$

where Q is the total dead weight of the trains which have made the trip during a period of several months, Q_a is the freight tonnage from Mendoza to Los Andes and Q_c the freight tonnage from Los Andes to Mendoza.⁸⁴ The formula was frequently recalculated to take into account variations in the imbalance in traffic in each direction.

By agreement between the two Andean railways and the railway from Buenos Aires to the Pacific (three British companies), combined tariffs were established between Los Andes and Buenos Aires, based on the compensated distances on each section, but the tariff for livestock was not calculated on the same basis. As a result of these agreements, the breakdown of charges for some typical products, expressed in Chilean currency per metric ton in a full wagon, was as follows:

Products	Valparaíso- Los Andes (140 km)	Los Andes- Border (71 km)	Border- Mendoza (185 km)	Total Valparaíso- Mendoza (396 km)	Mendoza- Buenos Aires (1,053 km)
From Chile to Argentina:					
Beans	39.50	33.43	46.85	119.78	87.72
Cement	20.60	25.61	35.89	82.10	131.22
Wine in casks	39.50	40.11	56.22	135.83	105.27
Wine in bottles	51.30	40.11	56.22	147.63	292.90
From Argentina to Chile:					
Wheat	29.70	34.32	48.09	112.11	85.59
Cotton seed	29.70	35.64	49.95	115.29	85.59
Sheep (per head)	2.12	8.50	11.92	22.54	3.34
Cattle (per head)	17.25	37.79	52.96	108.00	14.83

Source: Marín Vicuña, *Política ferroviaria de la América*, op. cit., p. 49.
Simón and others, op. cit., p. 36.

Although the tariffs reflected the agreement on the splitting of freight between the two sides of the trans-Andean railway, anomalies persisted which impeded rational use of the international section. Thus, for example, the rate for cement from Mendoza to Buenos Aires was comparatively high, since it was equivalent to an implicit tariff on Chilean exports of that product to the Buenos Aires market. Furthermore, the trans-Andean rate for live cattle was very high compared with that for the section between Mendoza and Buenos Aires, thus lessening the possibility that livestock would

be exported from Mendoza through the port of Valparaíso. At all events, the basic problem was the freedom of the three British companies to fix charges at rates which maximized their own profits, without taking into account the effect on the development of international trade.

Between 1916 and 1920, the Ferrocarril Transandino Chileno registered operating profits in three years and losses in two, but even the profits fell far short of what was required to cover the interest on the capital, and the Chilean Government guarantee came into force. Moreover, since this guarantee covered a period of only 20 years, it would expire step by step in 1926, 1928 and 1930, and when it expired completely the company would go bankrupt as

⁸⁴Ibid., p. 35.

a result of its inability to pay interest to the holders of the bonds, to whom the railway was mortgaged. In anticipation of this possibility, the company approached the Chilean Government with a view to avoiding such a disastrous eventuality. The Government, too, wished to avoid the bankruptcy of the company, and was also very anxious to change the form in which the two Andean companies were administered, considering that they would work better under unified control.

As a result of these approaches, in which the Argentine section and the Government of Argentina also participated, the Chilean Government proclaimed law N.º 3803 of September 1921, which represents a classic example of the skills of firms from outside the continent in their negotiations with Latin American governments. Instead of allowing the Chilean Guarantee on interest to expire, as was laid down in law N.º 1588 of February 1903, the new law authorized the issue of Chilean State bonds which would be exchanged for the railway bonds, with the annual amount of interest exactly equal to the former guarantee, but including amortization of 1% a year. In turn, the preference shares were converted into ordinary shares, and 70% of them were transferred to the Government of Chile. Furthermore, the company was authorized to issue new bonds for a total amount of £ 500,000, with State-guaranteed interest of 7.5%, which would be invested in electrifying the line, paying off bank debts and improving protective works. Finally, the law laid down a basis for the unified administration of the two Andean sections in the following terms:

"5. The Company undertakes to unify previously, under the corresponding agreement, the administration of its railway with the administration of the Ferrocarril Transandino Argentino in order to provide services jointly as if there was a single company. The lines will be unified in agreement with the President of the Republic, who shall be authorized to concert with the Argentine Government regulations concerning the exchange of traffic and the role the two Governments will have in fixing charges."⁸⁵

The report to the Ministry of Communications to which reference has been made sums up this episode in the following terms:

"... as far as the trans-Andean railway is concerned, the State has done nothing but maintain, with its own budget resources, the life of a company which would have disappeared many years ago if abandoned to itself. This drain on the National Budget has not benefited either trade or production, but merely the holders of the bonds and the financial agents of the Company."⁸⁶

It may be argued that the Chilean Government had paid too high a price in its eagerness to institute a single administration for both sections of the Trans-Andean Railway. However, at least it received in return an opportunity, as owner of 70% of the ordinary shares, to impose its will and ensure that the railway was administered bearing in mind the national interest. Unfortunately, this did not result either.

In January 1922 the Compañía del Ferrocarril Transandino Chileno and the Compañía del Ferrocarril Transandino Argentino concluded an agreement on the unified administration of both companies, which was endorsed by the Chilean Government in February of the same year. Under this agreement a Joint Committee, composed of equal numbers of delegates from the boards of each of the two companies, was set up to appoint the General Manager of the unified lines and carry out all functions related to operations previously held by the two boards. Specifically, the rolling-stock and locomotives of both companies were to be used jointly, and the charges would be fixed by the Joint Committee. In order to put the agreement into effect, the Ferrocarril Transandino Argentino was to regain administration of its own line, which till then had been under the Ferrocarril de Buenos Aires al Pacífico.⁸⁷

Despite the prospects opened up by the agreement, the Joint Committee when set up was made up of two representatives of the Government of Chile, one representative of the Government of Argentina, and three rep-

⁸⁵ Simón and others, *op. cit.*, pp. 46-47.

⁸⁶ *Ibid.*, p. 49.

⁸⁷ *Ibid.*, pp. 51-53.

representatives of the private shareholders of the two companies, so that the Chilean Government, instead of three representatives out of five, as it had on the board of the Transandino Chileno, came to have two representatives out of six on the Joint Committee. In addition, there was a substantial overlap between the private shareholders in the two trans-Andean companies (the chairman of the board of the Transandino Chileno was a member of the board of the Transandino Argentino), so that the representatives of the private shareholders tended to adopt joint positions. Worse still, the Joint Committee set up its headquarters in London, so that the Chilean Government could only be represented through diplomatic agents in London. Finally, almost all the executives appointed by the Joint Committee to administer the railway were British, with no substantial participation either by Chileans or by Argentines. After all the financial sacrifices made by the Government of Chile, matters remained as before. As the report to the Ministry of Communications said:

"In this way the administration of the Transandino Chileno, as exercised through the Joint Committee, preserved in a national railway all the characteristics of a British colonial line."⁸⁸

The establishment of the Joint Committee, with headquarters in London, did not put an end to the expenditure incurred by the two former boards. More curiously still, while the board of the Transandino Chileno and the Joint Committee were based in London, a three-member local board with rather vague functions was established in Chile. As a consequence of this luxuriant proliferation of boards and authorities, the administration costs of the Transandino for Chile reached more than Ch\$ 557,000 in 1927, whereas the administration costs of a whole zone in the Southern network of the Chilean State railways came to only about Ch\$ 77,000 in the same year. It is also worth noting that the Transandino carried some 40,000 tons of freight and 20,000 passengers, while the zone of the Southern Network referred to carried some 500,000 tons of freight and 3 million passengers.⁸⁹

The verdict of the report to the Ministry of Communications could be no other than the following: "In short, the Transandino Chileno is really a British railway, operated by Britons, directed from Great Britain but paid for with Chilean capital."⁹⁰

Such a situation could not last, and it was obvious that the position of the unified company was totally anomalous. As the report stated several times:

"In fact, both the Transandino Chileno and the Transandino Argentino—standing as they do between the major companies, the Ferrocarriles del Estado de Chile and the Ferrocarril de Buenos Aires al Pacífico—are equivalent to a resistance inserted in a circuit carrying heavy traffic."⁹¹

Sooner or later the Argentine and Chilean sections would be merged with the main railways of which they were actually branches, and this finally was the recommendation made in the report to the Ministry of Communications.⁹²

Nevertheless, it was clear that purchasing the railway would not be easy, especially after having saved the company by means of the 1921 law. The report to the Ministry stated: "If the shares referred to were freely sold on the market, the Government could acquire them in lots on different dates in order not to raise the price.

"However, this is not the case; the minority shares are controlled by a financial group which is ably directed and which has succeeded in obtaining benefits from every negotiation with the Government of Chile. Furthermore, the same group controls a part (we cannot say whether it is the majority) of the shares in the Transandino Argentino. The resistance, accordingly, would be exercised by the two Transandinos and against the two Governments.

"It goes without saying that this resistance would be exercised only to uphold the price of the shares. It is not to be supposed that the financial group in question has the slightest

⁸⁸*Ibid.*, p. 60.

⁸⁹*Ibid.*, pp. 60-64.

⁹⁰*Ibid.*, p. 76.

⁹¹*Ibid.*, p. 70.

⁹²*Ibid.*, pp. 69-74.

interest in ensuring the survival of the companies out of a simple spirit of international philanthropy aimed at encouraging trade between Chile and Argentina."⁹³

In May and December 1932 the Transandino Argentino suspended rail services because of financial losses,⁹⁴ and in 1934 steps were initiated to transfer both trans-Andean companies to the Governments concerned. The negotiations coincided with a break in continuous traffic between 1934 and 1944, after

an avalanche destroyed a substantial part of the track on the Argentine side. In 1935 a protocol between the Governments of Argentina and Chile provided for the establishment of a committee to study the situation, and finally in 1937 the two sections were purchased by the respective Governments.⁹⁵ In 1944, after the line had been reopened to continuous traffic, the railway between Los Andes and Mendoza was in a position to play its proper role for the first time.

VI

Analysis of possibilities of co-ordinating international railway sections

At the beginning of this work, we wondered whether the international sections had ceased to have the justification they had when they were built. If this were the case, then the fact that South America had not obtained the originally hoped for benefits from these sections because it had not ensured proper operational and commercial co-ordination of its railway services would be merely of historical interest. On the other hand, if most of these sections still have a clear role to play today as instruments for integration and development, it is obvious not only that it is vital to correct the mistake of the past, but that it would be irresponsible not to make use of this extensive infrastructure which we have inherited as a result of the sacrifices of our grandfathers. In my view, international railway transport does play precisely this role in South America, and this explains the fundamental meaning of my work.

In recent years CEPAL has carried out various research projects on transport between Lima and Buenos Aires, Lima and São Paulo

and Santiago and Caracas, in co-operation with other regional bodies.⁹⁶ These studies have made it clear that in comparison with shipping, international land transport offers clear advantages to exporters and importers of a wide range of goods. Two factors which have become important only in recent decades underline the role of land transport in the Southern Cone: firstly, the growing trade within Latin America in manufactured products of higher unit value than the commodities which traditionally dominated the area's trade, and secondly, the growing importance of certain poles of development in the interior of the continent, such as Santa Cruz, Salta and Corumbá.

To give a single example of the potential of land transport, table 1 outlines the comparative costs of the transport of copper by sea, by road and by rail between Rancagua and São

⁹³*Ibid.*, p. 72.

⁹⁴*Los ferrocarriles internacionales de Sudamérica...*, *op. cit.*, p. 134.

⁹⁵*Ibid.*, p. 135; *Proyectos multinacionales de infraestructura física...*, *op. cit.*, p. 231.

⁹⁶See "Servicios de transporte terrestre internacional en los corredores Lima-Buenos Aires y Lima-São Paulo" (E/CEPAL/1007) and "Perspectivas del transporte internacional por carretera en la subregión andina" (E/CEPAL/L.154 and Add. 1 and 2).

Paulo. As can be seen, the lowest-cost option is B.4, exclusively using railways from Rancagua to São Paulo *via* Las Cuevas, while the most expensive is the option using road transport for the whole journey. All the multimodal options which used railways cost less than the multimodal option using shipping.⁹⁷

Table 1

SOME ALTERNATIVES FOR TRANSPORTING COPPER FROM RANCAGUA TO SAO PAULO
(Cost breakdown of the MTE and transport times)

ALTERNATIVES	SECTIONS OR OPERATIONS	COST PER SECTION OR OPERATION US\$/TON.	DIRECT COST OF THE MTE US\$/TON.	AVERAGE TRANS-PORT TIME IN DAYS
By sea: A	Rancagua-San Antonio, by rail ¹	5.00		
	Transshipment in San Antonio	750		
	San Antonio-Santos, by sea	53.17		
	Transshipment in Santos	15.50		
	Merchant navy tax (20% of sea freight charge)	10.63		
	Port improvement tax (3% of cif value at US\$ 1,495/ton)	44.86		
	Customs clearance in Santos	4.00		
	Santos-São Paulo (customer's warehouse) by road	9.00	149.66	40
By land: B. 1	Rancagua-Mendoza, by road (including transshipment in Mendoza)	50.00		
	Mendoza-Buenos Aires, by rail ²			
	Transshipment in Buenos Aires	44.00		
	Buenos Aires-Uruguaiana, by rail ³			
	Transshipment in Uruguaiana	2.00		
	Customs clearance in Uruguaiana	2.00		
	Uruguaiana-Barra Funda, by rail ⁴	25.00		
	Transshipment in Barra Funda	2.00		
	Barra Funda-São Paulo (customer's warehouse), by road	5.00	130.00	18
B.2	Rancagua-Osorno, by rail ¹	15.00		
	Transshipment in Osorno	2.00		
	Osorno-Bariloche, by road	25.00		
	Transshipment in Bariloche	2.00		
	Customs formalities in Bariloche	2.00		
	Bariloche-Buenos Aires, by rail ⁵			
	Transshipment in Buenos Aires	52.00		
	Buenos Aires-Uruguaiana, by rail ³			
	Transshipment in Uruguaiana	2.00		
	Customs clearance in Uruguaiana	2.00		
	Uruguaiana-Barra Funda, by rail ⁴	25.00		
	Transshipment in Barra Funda	2.00		
	Barra Funda-São Paulo (customer's warehouse) by road	5.00	134.00	21

⁹⁷Three taxes are included in shipping costs: the 3% tax on freight levied by the Caja de Previsión de la Marina Mercante de Chile, which is included in the shipping tariff in table 1; the additional freight tax for the renewal

of the Brazilian Merchant Fleet, equivalent to 20% of the value of the cargo imported; and the Brazilian port improvement tax, equivalent to 3% of the cif value of the goods.

ALTERNATIVES	SECTIONS OR OPERATIONS	COST PER SECTION OR OPERATION US\$/TON.	DIRECT COST OF THE MTE US\$/TON.	AVERAGE TRANS- PORT TIME IN DAYS
B.3	Rancagua-Socompa, by rail ⁶	40.00		
	Socompa-Santa Fe, by rail ⁷			
	Santa Fe-Paraná, by road (including transshipment)	50.00		
	Paraná-Uruguaiana, by rail ³			
	Transshipment in Uruguaiana	2.00		
	Customs clearance in Uruguaiana	2.00		
	Uruguaiana-Barra Funda, by rail ⁴	25.00		
	Transshipment in Barra Funda	2.00		
	Barra Funda-São Paulo (customer's warehouse) by road	5.00	126.00	25
B.4	Rancagua-Las Cuevas, by rail ⁸	22.00		
	Las Cuevas-Mendoza, by rail ⁷	12.50		
	Transshipment in Mendoza	2.00		
	Mendoza-Buenos Aires, by rail ²	44.00		
	Transshipment in Buenos Aires			
	Buenos Aires-Uruguaiana, by rail ³			
	Transshipment in Uruguaiana	2.00		
	Customs clearance in Uruguaiana	2.00		
	Uruguaiana-Barra Funda, by rail ⁴	25.00		
	Transshipment in Barra Funda	2.00		
	Barra Funda-São Paulo (customer's warehouse), by road	5.00	116.50	23
B.5	Rancagua-São Paulo (customer's warehouse), by road	170.00	170.00	12

¹Ferrocarriles del Estado de Chile, 1.676-m gauge.

²Ferrocarril General San Martín, 1.676-m gauge.

³Ferrocarril General Urquiza, 1.435-m gauge.

⁴Redo Ferroviaria Federal S.A. and Ferrovias Paulistas S.A. (both 1.080-m gauge).

⁵Ferrocarril General Rosa, 1.676-m gauge.

⁶Ferrocarriles del Estado de Chile, 1.676-m gauge between Rancagua and Calera and 1.000-m gauge between Calera and Socompa. In Calera the bogies of the wagons are changed.

⁷Ferrocarril General Belgrano, 1.000-m gauge.

⁸Ferrocarriles del Estado de Chile, 1.676-m gauge between Rancagua and Los Andes and 1.000-m gauge between Los Andes and Las Cuevas (inside of end of tunnel). In Los Andes the bogies of the wagons are changed.

These same studies show that the potential of the physical infrastructure, built with enormous efforts which are a tribute to the engineering skills and industriousness of South Americans, will remain unused until men emerge who are prepared, with the same imagination which was manifested during the construction of the routes, to embark on the arduous task of joining forces to eliminate the

administrative barriers to the creation of the institutional infrastructure which is essential if international railway services are to begin to operate as they should. In this way we can prove that the expectations suggested by intuition are correct: small investments—added to large doses of goodwill and solidarity—will suffice to overcome some problems standing in the way of the operation of

such services which have not yet been solved because of insufficient willingness to undertake joint action.

Traditionally, international railway transport has been characterized by the transfer of responsibility at the moment of passing the freight wagon on at the point of connexion between the routes of two separately administered companies. In this way, international rail transport is equivalent to the sum of the national transport services of two or more interconnected companies. This type of service must compete in the international market with such means as road transport, where the truck covers the entire route under the responsibility of a single carrier, as is also the case with sea and air transport.

Some studies of the factors affecting demand for international transport services have demonstrated that this demand is determined by the cost of transport and by the quality of service throughout the journey. The users demand that the transport company should solve all the problems which arise in moving the goods from the point of origin to the point of destination. Door-to-door transport service is much more important to users in international transport than in national transport. Hence the greater importance of co-ordination in order to arrange an international transport service.

In view of the fact that the services required by international traffic on international rail routes will continue to be provided within each country by the same companies which are responsible for national traffic, and that in most cases international traffic is of only marginal importance to them, it is necessary to analyse the requirements for co-ordination between these companies at least at the three following levels:

(a) *Operational co-ordination*, which includes agreements on itineraries, exchange of wagons, transshipment, documentation, and so on, and which might be viewed as a question of facilitation, in other words the elimination of physical or administrative obstacles to the expeditious movements of wagons in international traffic;

(b) *Commercial co-ordination*, which relates essentially to relations with the users, the

aim being to enable a customer to solve all his problems through a single company without having to deal separately with each company involved. This co-ordination should include agreements on the harmonization of freight classifications, the fixing of charges, single payment of charges for the entire journey, sales promotion, complaints services, and so on;

(c) *Co-ordination of programmes and plans* which aim at sharing work on the design and implementation of investment projects required to improve the operation of the international sections.

In 1964, at the initiative of the railway companies of the Southern Cone of South America, whose networks make up an international railway system, the Latin American Railways Association (ALAF) was set up for the purpose of "promoting safe, efficient and economic railway transport; stimulating trade by railway; and ensuring the co-ordination and progress of Latin American railways and railway industries, as a means of achieving social and economic integration for the benefit of the peoples of Latin America".⁹⁸

Until the establishment of ALAF, the railways were immersed in their local problems, and possibilities of co-ordination between them were minimal. From the outset ALAF has attached the greatest importance to promoting international rail transport and, with the aim of institutionalizing its work in this direction, it established the Zonal Groups, first binational in nature, and later multinational, as required. The periodic work of these Zonal Groups is a typical example of co-operation among developing countries, and has offered an opportunity for contacts between railway executives at the highest level, so that they can undertake the task of co-ordinating international rail traffic.

Under the sponsorship and co-ordination of ALAF, there has been a vast increase in the meetings of Zonal Groups to analyse the operational problems of all the international railway connexions in order to improve the transport services offered to users, thus making it possible to tackle in the field a series of measures ranging

⁹⁸ Statute of the Latin American Railways Association, art. 2.

from co-ordination of itineraries and work on border interchange stations to the leasing of traction equipment between connected networks in order to facilitate the operation of trains. For some connexions, such as those between Arica and La Paz, and between Los Andes and Mendoza, ALAF has encouraged the railways concerned to co-operate in carrying out comprehensive studies designed to improve the co-ordination of services and the carrying capacity, although the results are still limited.

As a result of the action of these Groups, the traffic agreements between the railways have been improved, and under the direction of ALAF a model agreement has been prepared to guide the modification and adjustment of the standards governing bilateral traffic, with a view to standardization.

An experiment in transcontinental transport carried out in 1974 as part of a joint project by CEPAL and the Instituto para la Integración de América Latina (INTAL), with the co-operation of ALAF and the railway companies of Chile, Argentina, Bolivia and Brazil, demonstrated the technical feasibility of this type of transport between Antofagasta and São Paulo, but there remained a clear need for institutional agreements regulating multinational railway transport. Under the direction and co-ordination of ALAF, and with advisory services from CEPAL and the experience and firm determination of the railway companies of Argentina, Bolivia, Brazil, Chile, Paraguay, Peru and Uruguay, the Agreement on Multinational Freight Transport by Rail, known as the MULTILAF Agreement, was drawn up and is now fully in force, although some temporary restrictions still remain.

As regards concrete progress in international transport since the establishment of ALAF, there has been a very substantial increase in transport on various international rail links, particularly between Bolivia and Brazil and between Argentina and Brazil. It is also possible to note an interesting flow of copper traffic by rail from Chile to Brazil through Argentina, which has demonstrated the technical and economic feasibility of transcontinental rail transport over distances of more than 4,000 km in competition with other forms of land and sea transport.

The active and growing competition provided by road transport for international railways today means that the position of the latter is much more difficult than it was 50 years ago. Nevertheless, the present determination to ensure the essential co-operation and co-ordination among national companies in neighbouring countries opens up better prospects than in the past for more effective exploitation of the inherent advantages of railways in international traffic. If this preparedness and determination had existed at the right time in the past, the economic history of the subregion would have been different, and regional integration would have been a reality at a time when some visionaries looked forward to it as a dream of the future.

The creation of ALAF has led to a profound change in the attitude of the railways to international rail traffic. The repercussions cannot yet be assessed in the absence of a historical perspective, but it is very likely that in coming years the history of international railways in South America will be divided up into two periods: before ALAF and after ALAF.