THE DEVELOPMENT OF THE MEXICAN RAILWAY SYSTEM
FROM ITS EARLY BEGINNINGS DOWN TO 1911

by

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ABSTRACT

The purpose of this work is to present a detailed and comprehensive study of the development of the major Mexican railways from their beginnings down to the year 1911.

The choice of this subject was conditioned by the awareness that no such work existed and the hope that such a work, besides its intrinsic interest, would prove a useful basis for a study of the wider implications of the development of railways on Mexico's economic and social life. Such a study is beyond my resources in time, material and experience, and so I have confined myself to describing the concessions, construction and operation of the railways themselves.

There is no detailed general history of the Mexican railways available in English. Such works as exist deal with one specific aspect of the railways or give a very superficial outline of the overall development, or else approach the subject purely from the viewpoint of the foreign investor. The amount of material, both primary and secondary, available in Spanish is, of course, much larger, but the only historical work which is both detailed...
and comprehensive is the series of chapters on the railways written by Sr. Francisco Calderón for Daniel Cosío Villegas's monumental "Historia moderna de México". These chapters contain a wealth of information and I here acknowledge the great debt which I owe them in the preparation of this thesis.

However, Sr. Calderón deals with all the railways in chronological periods which makes it difficult to follow the development of individual undertakings. Therefore, I have attempted to discuss the railways as entities and, for the purposes of this thesis, I have selected the pioneering F. C. Mexicano and the four major companies which were consolidated in 1908 to form the basis of the Ferrocarriles Nacionales de México. These represent the main railways built prior to the Revolution.

Thus, after a brief introduction to 19th-century Mexico, the first chapter describes the protracted building of the F. C. Mexicano line to Veracruz and its subsequent development. The second chapter relates the battle for the concessions and the construction and operation of the lines to the U. S. border, the F. C. Central, F. C. Nacional and F. C. Internacional, whilst the third chapter deals
with the building of the F. C. Interoceánico line to Veracruz and some of the problems faced by the railways. The fourth chapter describes the formation of the Ferrocarriles Nacionales de México and, finally, the conclusion summarizes and sums up the preceding chapters. There then follow a bibliography and an appendix containing tables and graphs relating to the railways under consideration.

Where primary materials have not been available to me, I have relied heavily on Sr. Calderón's work, as mentioned above, cross-checking and supplementing it, where possible, from other sources. Every effort has been made to ensure the accuracy of the dates and figures given but the usual reservations regarding Latin American statistics must be made here also; many potentially useful statistics have had to be discarded because one source fails to correspond with another (and sometimes they conflict with themselves!)

All the railways, being American or British-owned, had titles both in English and Spanish, but for the sake of consistency, only the Spanish names have been used in the text of this work. Similarly, all distances have been given in kilometres (1 km. = 0.62137 or approximately 5/8
mile) but to avoid excessively complicated exchange calculations, bearing in mind the fluctuating exchange rates, I have left money sums in the currencies in which they have come to me.
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INTRODUCTION

Legend has it that when the Emperor Charles V asked Hernán Cortés about the general configuration of the Mexican landscape, the Conquistador replied by crumpling a piece of paper. The story sounds apocryphal but its grim appropriateness would be appreciated by all who have ever been concerned with the building and operation of railways in Mexico. For Mexico is an extremely mountainous country in which communications have always presented great difficulties. A large proportion of the population lives on the central meseta which is cut off from the coastal lowlands by altitude and by the twin barriers of the Sierra Madre mountain ranges. In addition to the mountains, vast areas of desert or tropical rain-forest combine to produce a terrain nine-tenths of which are unsuitable for agriculture. In short, Mexico, unlike Argentina, is not a propitious land for the construction of railways.

In the 19th century the situation of the country did not favour the operation of railways either. The harsh terrain, together with the maldistribution of land, produced an agricultural economy which depended largely on
subsistence farming or a sluggish latifundism with little in the way of commercial or export agriculture to provide a potential traffic for the new method of transport. The mining industry, once the mainstay of the Mexican economy, was in decay owing to the damage caused by the War of Independence and the many later revolutions and to a chronic lack of capital. Mexican manufacturing industry was at a most rudimentary stage whilst transport costs and customs duties so inflated the cost of imported foreign goods that they were the exclusive property of the rich minority. The grinding poverty of the vast majority of the population served to keep all sectors of the economy at a low level. In consequence, the outlook for railways in Mexico could scarcely be described as promising.

However, if the difficulties presented by nature and the state of the economy were discouraging, they paled into insignificance in comparison with the obstacles created by man. The first 50 years of Mexican independence have something of the character of a comic opera with gradations varying from the farcical antics of General Antonio López de Santa Anna to the melo-
dramatic tragedy of the Emperor Maximilian. Mexico, involuntarily or otherwise, became the prototype of the "typical" Latin American republic as a procession of splendidly-uniformed generals, sinister priests, earnest parliamentarians and hack journalists paraded across the stage of history into unhappy oblivion. From time to time the picture dissolves beneath a paper shower of constitutions, decrees, concessions, revolutionary manifestos, pamphlets, plans and worthless bonds, and as the air clears nothing is visible except the eternal peasant labouring in his fields and the shadow of the English debt.

Such was the first half century of the Mexican republic. Then, in 1876, the Revolution of Tuxtepec brought General Porfirio Díaz to the presidency and initiated the period of Mexican history known as the "Porfiriato" which lasted until 1911. The situation was transformed as if by magic. Under the benign guidance of the canny Díaz, who was president throughout these 35 years except for the 4 years between 1880 and 1884 during which the presidential chair was kept warm for him by his crony Manuel González, a new seriousness, marvellous for foreigners to
behold, descended upon the country. The generals returned to their barracks, the priests to their churches, the local chieftains to their state capitals and the journalists to the society columns and the ruling class gave up fighting each other in order to devote themselves full-time to the exploitation of the lower classes. Commerce expanded, agriculture and mining developed, the treasury was full. Progress was triumphant and the spectre of prosperity stalked the balance books as the volume of foreign trade climbed to unprecedented levels. Díaz presided over the transformation of Mexico from the colonial country which it was when he assumed office to the neocolonial country which it had become by the time he left it.

In his classic study on "Imperialism", Lenin says that railways "are the most striking index of the development of international trade and bourgeois-democratic civilization". While the Mexico of Porfirio Díaz lagged behind on the "bourgeois-democratic" part, it is nevertheless true to say that the prosperity of the regime, indeed its very existence, rested upon the development of international trade, particularly the export of raw
materials and staple commodities, and that an important contribution to this development was made by the railways which were built in Mexico both before and during the Porfiriato.

The first important railway to be built in Mexico was the line between Mexico City and the port of Veracruz. The first concession for this route was granted in 1837 but the project shared in the general agony of 19th-century Mexico and it was not until 1850 that the first short section of the line was opened to traffic. Even then another 23 years elapsed before the line was finally completed in 1873. The "Ferrocarril Mexicano", as it was called, was 423 kms. long, standard gauge and owned by a British company. It thus set a precedent for later railway development in Mexico, nearly all of which in the 19th century was foreign-owned. In a way, the F. C. Mexicano harked back to the old colonial structure in Mexico since it was hoped that one of its main sources of traffic and revenue would be manufactured goods imported from Europe through the port of Veracruz.

The next important group of lines to be built paved the way to the new neocolonial structure in which Mexico
exported raw materials to the rapidly developing industries of the United States. These lines, the F. C. Central, F. C. Nacional and F. C. Internacional, were all American-owned and ran to the U. S. border where they connected with the American railroads. The F. C. Central, running from Mexico City to El Paso, received its concession in 1880, began construction in the same year and was finished in 1884. The narrow gauge F. C. Nacional, which ran from Mexico City to Laredo, also received its concession in 1880 but its construction was slower and it was not completed until 1888. The F. C. Internacional received its concession in 1881, began construction in 1882 and ceased work on its main line, which in the event only served the north of Mexico, in 1892. The contrast between the time taken to build the F. C. Mexicano and the F. C. Central is an indication of the change which had come over Mexico with the advent of Porfirio Díaz. 23 years elapsed between the opening of the first section of the Veracruz line and the eventual completion of its 423 kms. in 1873 whereas the 1,970 kms. of the F. C. Central were inaugurated less than 4 years from the date of its concession.
The F. C. Interoceánico was formed in the early 1880's with the purpose of building a line from the Pacific to the Atlantic Ocean which would also destroy the monopoly of the F. C. Mexicano on the Mexico-City-Veracruz route. Only the latter aim was fulfilled when the railway completed its line from the capital to the Gulf Coast in 1891. Besides these railways many other secondary railways, subsidiaries, feeders, branches and mineral lines were built during the Porfiriato so that the total length of the Mexican railway system, which was about 650 kms. in 1876, reached over 19,000 kms. in 1910.

However, apart from the F. C. Mexicano which enjoyed a relatively sound business, the railways generally failed to fulfil the hopes fastened on them by their proponents, both Mexican and foreign. High operating costs caused by the difficult terrain, the relative scarcity of traffic, especially in the north, excessive competition, including the building of rival lines parallel to each other, and the adverse silver exchange rate, which seriously affected the earnings of these foreign-owned companies in their own currencies, were all responsible
for the failure of the railways to flourish. Therefore, in the early years of the 20th century, the Mexican government, largely at the instigation of the Minister of Hacienda, José Ives Limantour, began to acquire control of the ailing undertakings and in 1906-08 arranged the consolidation of the F. C. Central, F. C. Nacional and F. C. Internaciona l into the "Ferrocarriles Nacionales de México", a private joint-stock company in which the government was the majority shareholder and held absolute control. This company also controlled the F. C. Interoceánico and of the railways mentioned in this thesis, only the F. C. Mexicano remained aloof, retaining its independence until 1946. The Ferrocarriles Nacionales de México managed to survive the upheaval of the Mexican Revolution and continued as a private company until 1937 when the railways were nationalized by President Lázaro Cárdenas.
I. FERROCARRIL MEXICANO: THE MEXICAN RAILWAY

The first main line railway in Mexico, the "Ferrocarril Mexicano" running from Mexico City to Veracruz, was not finally completed and opened to traffic until 1873 but this late entry into the Railway Age does not do full justice to the efforts of the progressive elements in 19th-century Mexico. Indeed suggestions for building railways in Mexico were made as far back as the 1830's, soon after railways were first invented, but the turbulent history of the republic in the following 40 years rendered abortive nearly all the many attempts to give material expression to these projects. The spirit was very willing but the flesh, alas, was weak.

Some of the earliest suggestions and projects concerned a railway across the Isthmus of Tehuantepec which would make Mexico an indispensable link in the trade between the Atlantic and Pacific Oceans and between Europe and the Far East, but the great majority of the proposals concerned the route between Mexico City and Veracruz. The virtual unanimity of this choice may come as something of a surprise today but it must be remembered that ever since the days of the Spanish conquest, Mexico's
main trading links had been with Europe and Veracruz was the principal port of entry. Furthermore, at this time, most of the population was concentrated in the centre and south of the country and the north was largely unexplored and unpopulated, whilst the United States had not yet assumed its dominating world role.

Enthusiasm for the Veracruz railway was unlimited. As one deputy said: "Without the railway from Mexico City to Veracruz, we shall not be able to do anything... with it, we shall have everything." However there were many obstacles to its completion, not least of which were the novelty of the undertaking, the political instability in Mexico, the shortage of capital within the country and Mexico's notorious lack of credit abroad, and, last but not least, the engineering difficulties involved in making the ascent from the coast to the central meseta. Thus over 35 years elapsed between the first concession for the route and its eventual completion.

This first concession was granted in 1837 and had no material result. Another concession, granted in 1842, led to the construction of a short section of line at Veracruz which was opened to traffic in 1850 but a third
concession, granted in 1853, proved fruitless. Yet another concession, granted in 1855, resulted in the construction of a short line at Mexico City which was opened in 1857, in which year the line and the concession were sold to the Escandón brothers who were to be responsible for the eventual completion of the railway. These promoters obtained another concession in 1861 but their affairs received an unexpected jolt the following year with the French Intervention which lasted until 1867. Both the French and their puppet emperor, Maximilian, were anxious to see the Veracruz railway completed for military and prestige reasons and in 1864, Antonio Escandón organized a company in London known as the "Imperial Mexican Railway Company" to take over the construction of the line. The company survived the fall of Maximilian, dropping the word "Imperial" from its title and receiving a new concession from President Benito Juárez on 27 November, 1867, which, after a long wrangle in Congress, obtained congressional approval on 11 November, 1868, with a few minor modifications. Construction work now began in earnest and in 1869 the line from Mexico City to Puebla via Apizaco was opened to
traffic. Work now concentrated on the main line from Apizaco to Veracruz and, in January 1873, the entire line from Mexico City to Veracruz was formally inaugurated.

The F. C. Mexicano was built under the European system of constructing railways, i.e., a heavy initial capital outlay to secure low maintenance and repair costs later, unlike the northern trunk lines which, being constructed under the American system, were built as cheaply as possible in the hope that future revenues would cover the cost of maintaining and improving the original work. Thus the time and money taken to build the F. C. Mexicano seemed to contemporaries scandalously excessive when compared with the initial cost of the F. C. Central and F. C. Nacional but, on the other hand, when the traffic on the railways failed to live up to the more sanguine hopes of their promoters, the F. C. Mexicano was in a more secure position than its northern rivals. It thus managed to survive the formation of the Ferrocarriles Nacionales de México and the years of the Revolution and continued as an independent concern until 1946.

(i) Ferrocarril Mexicano: The Building of the Line from Mexico City to Veracruz

The first known suggestion for building a railway in
Mexico concerned the Mexico City-Veracruz route and was contained in an anonymous pamphlet written in Spanish and published in New York in 1833.² This pamphlet praised British and American achievements in railway construction and claimed that the building of railways in Mexico would be easier and cheaper than in the United States because of the absence of cold weather; it gave the first, and lowest ever, estimate for the cost of the Veracruz line, 4,200,000 pesos, and the accompanying map shows that the proposed route ran through Tlaxcala, a region avoided by the later builders because of the difficult terrain. The author indicates that he, or the group he represented, had petitioned the Mexican government for a concession but no evidence of such a concession has yet been found either in the "Historia Parlamentaria" for 1832-33 or in the various published collections of laws.

The first known Mexican railway concession was granted by President Anastasio Bustamante to Francisco Arrillaga, a wealthy citizen of Veracruz, on 22 August, 1837, for the construction of a railway between Mexico City and Veracruz. The concession promised that no
harmful competing concessions would be granted in the area for 30 years and granted the right to use lands for the line itself or as a source of construction materials and to import certain machines, although not rails or rolling stock, through Veracruz duty-free. The government, however, would not pay any subsidy and in return for the above-mentioned privileges, imposed upon the construction company the obligations of paying 50,000 pesos annually to the Treasury for public works from the eleventh year to the end of the concession period, of beginning construction within 2 years and of completing it within 12 more years, of accepting a scale of maximum rates (e.g., 11 pesos for a load of 4 quintals from Veracruz to Mexico City) for an indefinite period, of building a branch line to the city of Puebla and of carrying the public mails free of charge.

In a pamphlet, Arrillaga outlined a route via Paso del Macho, Córdoba and Orizaba, with a single track branch to Puebla (the route eventually adopted by the F. C. Mexicano), the total initial cost of which he estimated at 5,000,000 pesos, of which over half was to be spent in building the first forty leagues west of
Veracruz through the mountainous section. He thought that Mexico was ripe for railways because of her agricultural and mineral wealth and expected to issue a dividend of at least 20% after only one year of operation and of almost 50% by the end of the tenth year.

Arrillaga showed great initial enthusiasm and undertook a survey personally but no construction work resulted because too few people had any real confidence in the new method of transport and internal disorders, the "Pastry War" with France and finally the death of Arrillaga himself intervened to put an end to any hopes of immediate progress.

Five years after the granting of the first concession, President Santa Anna, in response to pressure by the shareholders of the Mexico City-Veracruz road-building company formed in the 1820's, re-established the customs duty known as the "avería" and granted a new concession to the group responsible for the section of road between Veracruz and Perote on 31 May, 1842. This group was to receive an amount equal to 2% of all imports through Veracruz until the government's debt to them was liquidated; in return the group agreed to re-
pair the Veracruz-Perote road and construct a short railway line from Veracruz to the Río San Juan, both of which were to become the property of the government after the liquidation of the outstanding debt.

The group failed to fulfil its obligations. It drew up a construction contract with Antonio Garay without the authorization of the government and showed many signs of corruption and inefficiency: from 1842 to 1851, the promoters and Garay together received 1,939,131 pesos in "avería" returns and other forms but built only 11½ kms. of track which were later valued at 500,000 pesos. In early 1849 resolutions were introduced into Congress demanding the cancellation of the concession and Congress finally took action in November 1850, but the government did not secure control of operations until September 1851.

Meanwhile, however, the first railway to operate in Mexico was inaugurated on 16 September, 1850, when the section of 13 km. 150 m. from Veracruz to El Molino was opened to traffic. The original passenger and freight rates were modified on 25 January, 1851, so that the journey from Veracruz to El Molino for passengers cost
1 peso in a covered carriage, first class, 50 centavos second class, and 2 reales in open wagons, and for freight, 6 reales for 16 arrobas and for cattle, 1 real per head. No construction took place between September 1850 and December 1853 but between December 1853 and September 1854, 1 km. 630 m. was added to the main line and a short branch to La Caleta built at a cost of 103,065 pesos. A vigorous and efficient engineer, Santiago Méndez, then took over construction; he took up the Caleta branch, which had proved useless, built approximately 13 kms. of line in a space of 3 years and put a line of 25 km. 671 m. into perfect state of service at a cost of 313,088 pesos. By 1858, the line was operating 4 trains a week between Veracruz, Tejería and the Río San Juan, using rolling stock consisting of 2 locomotives, 3 passenger coaches and 8 freight cars.

Meanwhile, other parties were showing interest in improving transport facilities in this central region of the country. Proposals to form an interoceanic route by means of the Atoyac and Zempoala Rivers and portage railways were considered by a commission of the state legislature of Puebla between 1849 and 1851 and
by the "jefatura" of the city of Veracruz between 1851 and 1853. However there were no material results. In 1853, President Santa Anna granted two concessions to Juan Laurie Rickards, one, that of 31 October, to build a railway from Veracruz to Mexico City and the other, that of 28 November, for a line to a port on the Pacific coast. The concessionaire was bound to give 10% of all dividends declared to the government and to form a company in London within 8 months. Since he failed to do so, the concession was cancelled by President Ignacio Comonfort.

More positive results derived from the concessions granted by the government to the Mosso brothers (as they are always referred to in contemporary documents). The first was for a railway to run north-east from Mexico City to Santa Anna de Tamaulipas and the second, more important one was granted on 2 August, 1855, (the same day that the Rickards concession was cancelled) for a railway from the Río San Juan through Mexico City to Acapulco or some other point on the Pacific coast. By the terms of the concession, the undertaking guaranteed 10% of all dividends to the government and agreed to
transport government trains, munitions and troops at half rates in exchange for which it was empowered to use government and private lands along the route under the usual terms and to import construction materials and rolling stock free of all taxes.

The Mosso brothers appointed Manuel Restory to superintend construction but later replaced him with the American engineer Robert Gorsuch who built the first section of the route from Mexico City as far as Villa de Guadalupe. This section, about 5 kms. in length, was inaugurated by President Comonfort on 4 July, 1857.

The Mosso brothers, however, lacked capital and so they sold their concession together with the Mexico City-Guadalupe section, the rolling stock and the tools to the brothers Manuel and Antonio Escandón. The Escandón brothers then bought the Veracruz-Río San Juan line from the government for 750,000 pesos and secured a concession of their own from President Comonfort on 31 August, 1857. This concession was the first in which the government granted a subsidy instead of imposing financial obligations upon the concessionaires. The subsidy was to be 8,000,000 pesos in a new series of 5% bonds of the public debt,
amortizable in 50 years at the rate of 2% p.a.; to ensure payment of these annual charges, the government set aside half of a special fund known as "derecho de mejoras materiales", recently established in the customs law of 31 January, 1856, which amounted to one-fifth of all import duties; thus the government pledged 10% of the annual customs duties, its principal source of income, to the railway promoters. In return, the concessionaires were to buy up 8,000,000 pesos of the current series of public debt bonds, then quoted at about 3% of their nominal value, and present them to the Treasury within 6 years. Other privileges and obligations contained in the concession included the right to import any necessary materials duty-free, exemption from all other taxes for 50 years, permission to fix rates provided that the government was kept informed, the obligation to open 30 leagues of track for public use within 6 years, except in case of "fuerza mayor": if the undertaking failed to fulfill this obligation, it faced a fine of 150,000 pesos and the loss of its privilege and the fund of 8,000,000 pesos; the company was forbidden to mortgage its concession or property without official consent or to allow
the undertaking to pass into foreign hands; the line and its appurtenances were constituted as the perpetual property of the shareholders, the government was to receive 20% of the liquid profits and the company was to build a hospital and a prison for the government within 6 years at a minimum cost of 1,000,000 pesos, although the government also assigned certain funds to help defray the cost.

It is uncertain how much money actually changed hands as a result of this concession but it seems that whereas, in all probability, the Escandón brothers fulfilled their part of the contract by presenting 8,000,000 pesos in bonds to the government, the government did not pay even the first installment due to the contractors.

The new concessionaires retained Santiago Méndez to supervise construction at the Veracruz end but dismissed Gorsuch at the Mexico City end and replaced him with a group of American engineers under Colonel Andrew Talcot. Talcot surveyed both the Jalapa and the Orizaba regions for possible routes, finally deciding upon the latter. He estimated construction costs at 15,000,000 pesos. Manuel Escandón published a pamphlet entitled "Breve
Exposición" in 1858, setting out the advantages of the proposed railway but no work could be done because of the civil war known as the War of the Reform which, beginning in 1858, lasted until 1861.

An informal agreement was reached in July 1859 between the liberal government of Benito Juárez and the Escandón brothers in which the government attempted to ensure payment of the subsidy by creating special vouchers, known as "papel", which the railway company would sell to importers and which would be required by the government for payment of part of the customs duties. The government also granted the undertaking a portion of the public lands in Sonora and the Isthmus of Tehuantepec and released it from the obligation of building the hospital and prison, substituting a public monument and a small annual contribution to the National School of Agriculture. However no formal decree was issued and no positive action could be taken until the cessation of fighting.

The War of the Reform ended in January 1861 and on 5 April of that year the victorious liberal government of Benito Juárez granted a new concession to the Escan-
dón brothers. The main innovation of this concession was the establishment of a new government obligation consisting of 8,000,000 pesos of special "Bonds for the construction of the railway from Veracruz to Mexico City"; these bonds were to yield 5% interest and the interest and amortization on them were to be paid by 560,000 pesos to be set aside annually by the government for 25 years; the payments were to be guaranteed by the full amount of the "derecho de mejoras materiales", which represented one-fifth of all customs receipts and to guarantee payment, the government would issue special vouchers or "papel" which the company would sell to importers and which the government would require for the payment of import duties. The undertaking was released from the obligation of building the hospital and prison mentioned in the concession of 1857 as compensation for the interest not received between 1857 and 1861, could import articles necessary for construction and operation duty-free for a period of 30 years and could freely export the subsidy of 560,000 pesos to buy these articles abroad. In return the concessionaires promised to complete 44 leagues of track from Mexico City to
Puebla within 5 years, with a fine of 300,000 pesos if it failed to fulfil these conditions, whilst the government promised certain public lands in Sonora as a prize for the company on the day that the first train ran between Mexico City and Puebla. Finally, the concessionaires wrote off all their claims against the government under the concession of 1857.

Having obtained the concession, the Escandón brothers then proceeded to form a company to which they turned over their rights and obligations. This, the "Compañía del ferro-carril de México a Puebla", was capitalized at 5,000,000 pesos with the right to issue an additional 3,000,000 pesos of bonds. To increase public confidence, the services of the distinguished politicians Gregorio de Mier y Terán and Mariano Riva Palacio were obtained as president and vice-president of the administrative council.

Manuel Escandón wrote a "Segunda exposición", another optimistic pamphlet about the prospects of the line, whilst Antonio Escandón secured in the same year, 1861, separate concessions from the state of Veracruz covering the section of the proposed main line from Veracruz to
Orizaba and a branch line to Jalapa. A second company, similar to that for the Puebla section, was formed in Mexico City, with Ignacio de la Llave, the governor of Veracruz, as one of the founders, although he died soon after.

Little interest was shown in the shares of the railway in Mexico because of the uneasy political situation and so no construction was undertaken. In 1863 Manuel Escandón died but in any case the situation of the company had already been radically altered by the landing of French, Spanish and English troops at Veracruz in January 1862 which marked the beginning of the French Intervention. The railway undertaking, like many individuals and institutions in Mexico, was not averse to cooperating with the invaders and on 23 December, 1862, Antonio Escandón and certain representatives of the French army signed an agreement for the extension of the Veracruz line from Tejería (El Molino) to Chiquihuite, to be completed one month after the French had established themselves in Mexico City, i.e., by July 1863. However nothing was done and on 8 September, 1863, a new contract was signed whose terms were considerably more precise than those of the Juárez
concession. It stipulated the standard of construction and the wages for all classes of labour, obliged the undertaking to follow the directions of a French engineer and provided that the company would receive payment for all legitimate expenses through bi-weekly orders, with a general reckoning to be made after the completion of the line.

These two contracts apparently did not violate the concession of 1861 but were treasonable by the laws of 25 January 1862 which forbade Mexicans to collaborate with the invaders, although, in fact, many did so. The second contract stipulated that the line was to be extended to Chiquihuite, just beyond Paso del Macho, by 30 April, 1864, but it is uncertain whether this was fulfilled: according to a later engineer, Edward Jackson, most of the construction was temporary and unsuitable for heavy traffic and some of the bridges had not been built.

In August 1864, Antonio Escandón, now in Europe, organized a new company in London called the "Imperial Mexican Railway Company, Limited" to which he transferred all the various concessions and property which he and his Mexican company had formerly held in exchange
for 2,000,000 pesos in bonds and 4% of the net annual profit of the company, after the payment of all expenses and charges and a dividend of 8% p.a. to the shareholders, in perpetuity for him and his descendants. The capital of the English company was £2,700,000 divided into 135,000 shares of £20 each and the company estimated the total cost of the line, including the sections already built at £5,239,120 (27,000,000 pesos). Several reputable English financiers were on the board of directors in order to attract investors although, in fact, they only bought small blocks of shares.

Antonio Escandón had to apply for a new concession since that of 1861, obtained from a seemingly discredited government, forbade him to mortgage or transfer his rights to a foreign government or company. A concession was duly granted by the Emperor Maximilian in January 1865 which recognized the transfer of the railway from Escandón to the Imperial Mexican Railway Co.; permitted the free importation of construction materials for 10 years of operation; promised to pay 140,000 pesos every 3 months for 25 years, equivalent to the 560,000 pesos p.a. of the concession of 1861, and, in addition, 15% of
all customs returns for 5 years in exchange for which the company was to give the government the equivalent value in shares of the Imperial Mexican Railway Co. at par and without interest during the construction of the line and stipulated a list of maximum rates and a discount of 75% on the normal tariff for the transport of Imperial troops and war materials. The company, for its part, promised to finish the entire line including the branch to Puebla, by 1 January, 1870, and to give one-fifth of the net operating receipts to the government after the payment of a 6% dividend.

The full story of the financing of the Imperial Mexican Railway Co. is unknown since on this occasion, Escandón published few reports and pamphlets. Construction work was resumed in February 1865 by two English construction companies, Smith, Knight & Co. and G. B. Crawley & Co., who worked consecutively, but the operations of both concerns were supervised by the same engineer, William Lloyd. The latter produced a formal report on 1 March, 1866, which, not unnaturally, gave a very favourable picture of the state of the line and the stage of construction reached.
However, in May 1866, Eustaquio Barrón, a powerful Mexican financier and one of the leading creditors of the company, became alarmed at the mounting construction costs and on his own responsibility ordered the suspension of all operations except those necessary for the security of the installations. The employees were discharged, William Lloyd resigned his post and left for London, and rumours circulated of approaching bankruptcy. Nevertheless, on 21 January, 1867, Maximilian was able to inaugurate the 139 km. section from Mexico City to Apizaco, the junction for the Puebla branch.

Five months later Maximilian lay dead, executed by the victorious republican government of Benito Juárez, and the French Intervention was at an end. The Imperial Mexican Railway Co. tottered on the verge of bankruptcy, ready to share in the ruin of the Imperial government, but it managed to save the situation by judiciously mending some of its bridges with the republican government. The first step was taken on 16 July, 1867, when the company quietly dropped the word "Imperial" from its title and assumed the name by which it was to be known until its demise in 1946: the "Mexican Railway Co."
rendered in Spanish as the "Ferrocarril Mexicano" (although it was often simply referred to as "la compañía inglesa", the English company). The policy was obviously successful for on 27 November, 1867, President Juárez issued a decree pardoning the company for collaboration with the French and confirming its concession. He did so under the extraordinary wartime powers granted to him by Congress, a fact which assumed considerable importance in the subsequent congressional debates, and gave as his reasons the great importance to Mexico of the Mexico City-Veracruz line, the important interests engaged in the railway, the credit of Mexico, which was obligated by the bonds in circulation, especially in Great Britain, and the danger that cancellation of the concession would paralyse the building of the railway since its shares would lose the little value remaining to them. It is worth setting out the provisions of the concession of 27 November, 1867, in detail since it was under the terms of this document plus a few modifications added later as a result of congressional pressure that the Mexico City to Veracruz railway was finally completed. The concession pardoned the company for colla-
boration with the French and granted it an exclusive concession for the construction and operation of a railway between Mexico City and Veracruz for 65 years\textsuperscript{5} with the sole limitation that the government reserved the right to contract with one Ramón Zangronis for the continuation of the line from Veracruz to Jalapa, thus ratifying an act of Maximilian of 24 December, 1865. The railway was to be the perpetual property of the company which in return promised to complete the Apizaco-Puebla branch line by 31 December, 1868, and the Apizaco-Paso del Macho section of the main line by 31 December, 1871. The company was to have preference in constructing branches for a radius of 25 leagues on each side of the main line and was to receive the federal lands through which the track passed free of charge, the municipal lands in the path of the line expropriated and paid for by the company with shares in the railway according to a valuation by experts and private lands similarly expropriated and paid for in cash in accordance with the land tax assessment. The company was permitted to import the materials for construction and operation free of customs duties for 10 years and similarly to export
the 560,000 pesos annual subsidy for 25 years whilst the line and its appurtenances were to be exempt for 10 years from the payment of all taxes or duties, decreed or to be decreed. Workable mineral deposits found along the line of work were to become the property of the company, the company would fix the passenger and freight rates but without exceeding the maximum rates for Mexico City-Veracruz traffic set down in the concession while the rates for the transport of passengers and freight between intermediate points were to be proportional to the distance covered. Mexican products were to enjoy a 40% reduction for transport from Mexico City to Veracruz and intermediate points, the government was to receive a 50% reduction for the transport of troops, munitions and equipment and the mails were to be carried free of charge. The company could mortgage the completed sections except to a foreign government. The government promised to give the company an annual subsidy of 560,000 pesos for 25 years, to be guaranteed by the revenue of the "derecho de mejoras materiales" collected at the maritime customs, the collection of the subsidy being effected by means of special vouchers or "papel" to be issued by the govern-
merit, sold by the company to importers and required instead of cash to pay customs duties. If the company did not fulfill the above conditions, it would lose the concession and would have to pay a fine of 300,000 pesos; stoppage of the work for a month would bring a fine of 25,000 pesos and suspension of the subsidy. To hasten completion of the work, the government suspended until 31 December, 1871, the duty for amortization of the public debt, i.e., the additional payment of a quarter of import duties in bonds of this debt, replacing these bonds with shares of the railway company; the shares thus obtained by the government were to be inalienable and not to earn interest during the construction of the line.

The concession of 27 November, 1867, immediately encountered bitter opposition and criticism both in Congress and in the press. In the press, Manuel Payno wrote a series of critical articles for the leading newspaper, "El Siglo XIX", which were published in book form the same year, 1868, under the title "Memoria sobre el ferrocarril de México a Veracruz". The newspapers "El Ferrocarril" and "El Globo", supporters of General Porfirio Díaz, also attacked the concession. In Congress also the conserva-
tive and "porfirista" opposition attacked the concession. In some cases, the motive was the bitter partisan political feeling of the times which seized upon any pretext to attack the liberal government, but in other cases there was genuine alarm at the generosity of the terms offered to the company.

The debate in Congress began in January 1868 and lasted, with interruptions, until November of that year. The main supporters of the railway company and the concession were José María Iglesias, appointed Minister of Gobierno in June 1868, Blas Balcárcel, Minister of Fomento, Sebastián Lerdo de Tejada, Minister of Foreign Affairs, and Agustín Siliceo. The main opponents were Manuel Mendoilea, a deputy from Yucatán, Manuel Zamacoza, Hilarión Frías y Soto and Juan Zambrano.

The first question raised was: did Juárez have the power to issue the decree granting the concession of 27 November, 1867, under the extraordinary powers granted to him by Congress during the French Intervention and, related to this, did Congress have the right to discuss the validity of this concession. Congress appointed to study the matter a committee consisting of the
deputies Barrón, Montiel, Mancera, Mirafuentes and Zamacona, which handed in two reports towards the end of February 1868. The majority report, prepared by Barrón, Mancera, Mirafuentes and Zamacona, recommended that the decree be revised in order to achieve a substantial reduction in tariffs, to fix the value of the shares before the government engaged itself to buy them, to stipulate more precisely the time limits and conditions for the construction of the line, to obtain greater governmental supervision in the construction and operation of the line, to dispense with the special vouchers as a means of paying the subsidy and to stipulate in advance that the government could buy the line. The minority report prepared by Montiel said that the decree was not subject to revision since, as the Executive still enjoyed extraordinary powers when it issued it, it was then a competent legislator.

The two reports provoked a bitter polemic in Congress, the eventual result of which was to admit that the Executive had the authority to legislate until 8 December, 1867, on which day President Juárez returned his authority to Congress. Therefore the decree of
27 November, 1867 was valid. However, on being put to the vote, the majority report was approved by 71 votes to 38, thus declaring that Congress could revise the concession, like an international treaty. Although the Executive undoubtedly had the power to make the contract, the approval of Congress was necessary to make it valid.

The congressional committee next studied the modifications to be made to the concession and again presented two reports. The majority report, prepared by Barrón, Saavedra and Montiel, wished to limit the modifications to matters of little importance; it suggested that the special vouchers to pay the subsidy be replaced by "Bonos del Ferrocarril de Veracruz a México", which bonds were to be admitted in payment of 12% of import duties, the so-much-per cent being increased if disposal of the bonds was insufficient to cover the 560,000 pesos of the subsidy; that the bonds be used during the construction of the line and that after completion, the subsidy be paid in cash; that the reduction of 40% on freight rates for Mexican products transported from Mexico City to Veracruz be increased to 60% and that these products enjoy a reduction of 20% in the opposite
direction; that Antonio Escandón give back the 8,000,000 pesos in bonds received under the concession of 1857 before being given the new subsidy and that the exclusive privilege of construction granted to the company be replaced by a promise by the government not to subsidize for 65 years any other railway which attempted to build a new line from Mexico City to Veracruz. The minority report, prepared by Zamacona and Mancera, advocated more important changes: it suggested prohibiting the company from issuing mortgage obligations whose total sum would exceed one-quarter of the cost of the line; withdrawing the privilege and preference in constructing branches; liquidating the accounts with Escandón in order to deduct from the subsidy the amounts already received by the company; dispensing with the special vouchers and paying the subsidy in cash, and, finally, reducing the tariffs by 25% for foreign products, by 50% for Mexican products transported from the coast to the interior, by 75% for Mexican products brought from Mexico City to Veracruz and by 25% for passenger fares.

The company indicated that the conditions proposed by the minority were unacceptable and that it would sus-
pend construction if Congress approved them. In fact, all work did cease while the debate in Congress went on.

The debate was long and bitter with the opposition using three main groups of arguments to attack the concession. Firstly, there were the political arguments intended to demonstrate that the government lacked the power to legislate in this matter; these we have already discussed. Secondly, there were the economic arguments intended to prove that the obligations undertaken by the government could have been less or that the usefulness of the line was not sufficient to justify the subsidy. Thirdly, there were the purely formal arguments concerned with the question of national sovereignty and the dignity of Mexico. The arguments on economic grounds discussed in turn the subsidy, the purchase of shares by the government, the financing of the undertaking, the exemptions from duties and taxes, the privilege, the perpetual ownership clause and the freight rates and tariffs. They revealed a complete lack of knowledge and many misconceptions about the probable total cost of the line; the confusion was only increased by the widely varying estimates produced by the opposition as they attempted to
prove that the government subsidy would cover all or most of the cost of construction. Other attempts were made to prove that the freight rates of the railway would be only slightly lower, and perhaps higher, than those of the muleteers or to cast doubts on the solvency and honesty of the company, doubts which were not allayed by the company's refusal to reveal details of the capital subscribed. Attacks were launched against the company's right to mortgage although this was essential to its well-being since fear of political instability in Mexico made it difficult to sell the shares in London, where they were quoted at 18-25% of their nominal value. Other attacks on the exclusive privilege of construction were a reflection of the doctrinaire liberal ideas of the time but the company was finally forced to renounce this privilege and the right to construct branches in return for the promise that the government would not subsidize any other railway between Mexico City and Vera-cruz for 65 years, with the exception of that of Zangronis; this promise was enough to guarantee the elimination of future competition and served to quieten the protests in Congress and the press. Amongst the arguments
on the grounds of national dignity was the claim that the company had offered more favourable rates to the Imperial government than to the republican one although closer inspection of the arrangements concerned showed that this was not true. The method of paying the subsidy was also attacked since obligations on customs receipts often led to difficulties with foreign creditors, including armed interventions, and made it impossible for the government to make reliable budgetary and financial plans based on the accurate accounting of revenues and expenses.

Meanwhile, a company formed of the principal merchants and landowners of Puebla, associated with the government of the state, sought a concession for a line from Mexico City to Veracruz. It offered more favourable terms than the English company, such as requesting a smaller subsidy and promising lower rates, but the request was not convincing as the company obviously lacked the funds necessary to carry out the work.

Nevertheless the appearance of these new potential concessionaires won over to the opposition many deputies who had previously been convinced that the choice was between the English company or no railway at all.
Thus a vote of Congress on 1 October, 1868, rejected the majori-
yty report of the special congressional committee. But now the
opposition hesitated. If Congress approved the minority
recommendations, the English company would refuse to
continue construction whilst the opposition had no practicable alternative to offer in order to get the railway built. Furthermore, Lerdo de Tejada, a go-

government minister, had warned the Chamber that the govern-
ment considered itself obligated by the concession of 27
November, 1867, and that the national honour and good
faith were dependent upon its approval, even with minor
modifications. Consequently, in another vote, Congress
rejected the minority report by 79 votes to 62.

Thus Congress had rejected both the majority and the
minority reports. There was only one possible explana-
tion for this apparent paradox, namely that Congress de-
sired a solution halfway between the extremes of the two
reports. The government believed that it could make an
agreement based on the following points, which were also
acceptable to the company: the company would renounce
its right of preference in the construction of branches;
the reduction in freight rates for Mexican products.
would be 75% and the government would supervise the issue of securities made by the company to finance the work. A new report was then drawn up unanimously by the special committee; it was almost identical to the earlier majority report and did not significantly alter the terms of the concession of 27 November, 1867. This report was approved by Congress with the overwhelming majority of 107 votes to 20, mainly because Zamacona and Mancera supported it, and was embodied in a formal decree issued the following day, 11 November, 1868.

The decree of 11 November, 1868, stipulated the continuance of the concession of 27 November, 1867, with certain modifications, as follows. The company renounced the exclusive privilege of construction in return for the promise by the government not to subsidize any other railway between Mexico City, Veracruz and intermediate points for 65 years; because of the time lost through the congressional debates, all completion dates were set back by one year so that completion of the Apizaco-Puebla section was now scheduled for 31 December, 1869, and that of the Apizaco-Paso del Macho section, which completed the main line from Mexico City to Veracruz, for
31 December, 1872; the company renounced its preferential position in the construction of branch lines. The reduction for Mexican products transported from Mexico City to Veracruz and intermediate points was increased from 40% to 60% and a reduction of 20% was stipulated for Mexican products carried in the opposite direction. The government was empowered to alter the tariffs two years after the completion and opening of the line but in such a way that the profit to the shareholders would not be less than 12% p.a. The company was to turn in within 8 months all the outstanding bonds and coupons of the 8,000,000 pesos in bonds given to Antonio Escandón under the concession of 31 August, 1857. The annual subsidy of 560,000 pesos for 25 years was retained, payment to be effected initially by the issue of 560,000 pesos of "Bonos del ferrocarril de Veracruz a México" for each of the four years during which construction was continuing; these bonds were to be accepted in payment of 12% (instead of 20% as before) of the import duties collected in the customs houses of Veracruz, Tampico, Matamoros, Manzanillo and Mazatlán; after completion of the line the subsidy would be paid in cash. The reduc-
tion in charges for government passengers and freight was increased from 50% to 75% of the ordinary rate; the government required an official inspection of the construction and operation of the line as well as the approval of the articles of incorporation; the latter were to fix the maximum capitalization at 27,000,000 pesos, to be divided equally into shares and debentures, with interest on the latter not exceeding 8% p.a. without government approval; finally, the government demanded a fixed minimum representation of two-sevenths or three-elevenths on the board of directors, without prejudice to its representation as a shareholder.

Thus the terms under which the railway was to be completed were finally settled and construction work could now be resumed. Nevertheless the long debate left an unfavourable impression. It had exacerbated the ran-cour amongst politicians and journalists, caused doubt amongst the general public as to whether the interests of Mexico had been safeguarded and diminished the government's prestige by casting doubt on its authority and patriotism in issuing the decree of 27 November, 1867.

The situation facing the Mexican Railway Co. as it
resumed work in late 1868 was later to become familiar in the railway history of Mexico. The undertaking had two unconnected sections of line completed, from Mexico City to Apizaco and from Veracruz to near Paso del Macho; between the two sections lay a gap of about 200 kilometres including the escarpment which separated the coastal lowlands from the central meseta. The scaling of these heights promised to be both difficult and expensive.

The company resumed work under the direction of William Cross Buchanan, the chief engineer, assisted by four other British engineers named Foot, Murray, Hill and Pringle and the Mexican engineers González Cosío, Bulnes, Bezares and others. Thomas Braniff was the superintendent of construction. In accordance with the terms of the concession, work was at first concentrated on the branch line from Apizaco to Puebla which was inaugurated on 16 September, 1869, three months ahead of the deadline set by the decree of 11 November, 1868. The rate of construction on the main line between Apizaco and Paso del Macho then increased. The line was opened from Veracruz to Atoyac, a distance of approxi-
mately 80 kms., in 1870 and extended another 28 kms. to Fortín, just beyond Córdoba, by December 1871.

There still remained the difficult mountainous section between Fortín and Boca del Monte, especially the part between Maltrata and Boca del Monte. The distance between Orizaba and Boca del Monte as the crow flies is only 24 kms., but in this short space a difference in height of 1,178 m. has to be gained; furthermore the terrain is very uneven and whereas the gradient, if it were uniform, would be an unbroken 5%, if it followed the topographical configuration, it would be more than 12% in some places. Therefore, to lessen the gradient, the railway followed an indirect line taking advantage of the unevenness of the terrain even though the total length of the section was almost doubled in this way, reaching 40 kms.

Another serious obstacle was the Metlac gorge between Córdoba and Orizaba. The engineers at first planned a large and expensive viaduct about 300 m. long but in 1871, Buchanan obtained official approval for a less expensive plan in which the line would descend as far as possible along the sides of the gorge and then cross it
on a curved iron bridge less than 150 m. long. The bridge took nearly two years to build, being completed in September 1872, and on the 5th of that month the first locomotive ran from Veracruz to Orizaba, a distance of about 130 kms.

On 20 December, 1872, the company informed the Minister of Fomento that the rails had been joined at Maltrata summit and that the line was finished and ready to be officially received. The government named a commission composed of the engineers Francisco Chávero, Joaquín Gallo and Mariano Téllez Pizarro to examine the line. In the short time available, the commission made a thorough inspection of the line, including running trains over the three largest viaducts at greater than normal speeds. It then submitted a generally favourable report except to condemn a few sharp curves caused by temporary tunnels, recommending speed limits as low as 10-12 km.p.h. in some places, and concluded that the inauguration ceremonies could be carried out as scheduled with the minimum of danger provided that the ceremonial train did not go too fast.

Approval of the Fortín-Orizaba and Boca del Monte-
Apizaco sections was given on 29 December, 1872, but that of the section over the summit from Orizaba to Boca del Monte was delayed until 31 December, 1872, whilst a few minor adjustments were made.

On the same day, in Mexico City, Archbishop Labyrinth blessed the railway at Buenavista station and the capital gave itself over to celebrations in honour of the latest "material improvement". The following day, 1 January, 1873, the entire line from Mexico City to Vera-cruz was formally inaugurated. A special train carrying President Lerdo de Tejada, who had succeeded Juárez in July 1872, and his official party left Mexico City at 5 a.m., followed an hour later by another train carrying the principal ladies of the capital. A large number of journalists also accompanied the trains and duly reported the marvels of the journey and the speeches and celebrations which marked the frequent stops made at all the large towns. Alfredo Balbot of "El Federalista" described the journey through the mountainous section in enthusiastic terms:

What a horribly beautiful spectacle! The locomotive and the long line of carriages are almost constantly running along the edge of dizzy abysses. At times the line is cut out of the living rock.
Gigantic works have been undertaken and the daring both of the conception and the execution, its very rashness even, bring cries of wonder at every step ... We pass from the top of one hill to another and yet another ... We admire a variety of beautiful landscapes; there must be similar ones in Switzerland but those are viewed from a stagecoach, not a railway ... The track has so many twists and turns that it resembles a huge snake. At half past four, as we found ourselves in the plain of Maltrata, we were able to make out the second train, high up there on the summit from which we had just descended ..., in spite of the distance, we greet it with loud cheers. It was a magnificent and imposing spectacle. In the station at Maltrata, where we did not stop, a priest surrounded by his parishioners greeted the train with enthusiasm. We reached Orizaba at half past five ... Sr. Lerdo was received with a great display of enthusiasm. There were artillery salvoes, rockets and acclamations. In Orizaba we met the journalists from Havana and some of the officers of the "Isabel la Católica", all looking very smart.

The entire journey took two days since apparently the engineers of the company were reluctant to negotiate some of the temporary tunnels and curves at night.

Following the safe arrival of the trains in Veracruz, a great celebration took place in the port city. The railway was formally opened to public traffic on 22 January, 1873.

The line thus inaugurated amidst such great public rejoicing was Mexico's first railway of more than purely
local importance. The main line from Mexico City to Veracruz was 423 km. 750 m. long whilst the branch from Apizaco to Puebla measured 47 km. giving a total length of approximately 470 kms. The railway was noteworthy not only because it inaugurated the railway age in Mexico but also as an engineering work in its own right. The section between Orizaba and Boca del Monte in which the line scaled the heights leading to the central meseta in particular excited comment. In all, the line of the F. C. Mexicano, including the branch to Puebla, counted 10 viaducts, 55 iron bridges, 93 wooden bridges and 358 culverts of various descriptions. The main bridges were those of Soledad (228 m.), Paso Ancho (50 m.), Paso del Macho (80 m.), San Alejo (97 m.), Atoyac (100 m.), Río Seco (76 m.) and Metlac (137 m. on a curve); the main viaducts were those of Winer and Infiernillo between Orizaba and Boca del Monte. The bridges and viaducts built of wood were temporary structures which were gradually replaced by permanent iron structures. There were 15 tunnels and one covered gallery, all between Chiquihuite and Boca del Mónte; the four longest tunnels were respectively 107, 91, 80 and 61 m.
long and the total length of the 15 tunnels was 897 m.; the covered gallery was 76 m. long. There were 30 stations on the whole line, some built of rubble-work and adobe, some of rubble-work and wood and some of wood alone; of the main stations only that of Puebla was completed although most of the work on the Orizaba station had been finished. The rolling stock which provided the service on the newly-completed line consisted of 26 locomotives, 36 passenger coaches and 341 freight cars.

The company was registered in London and governed there by a board of 10 directors, two of whom were appointed by the Mexican government according to the terms of the concessions of 1867 and 1868. In Mexico, the company's affairs were attended to by a local staff which initially comprised one chief engineer, three superintendents of maintenance, one local superintendent in Jalapa, two locomotive superintendents, one chief accountant and one head of company stores.

The total cost of the F. C. Mexicano was a subject of controversy both before and after the completion of the line, no reliable estimate being available until Matías Romero, the ex-Minister of Hacienda, published a
study in the "Memoria de Hacienda" for 1879 in which he stated that in accordance with the contract signed between the original concessionaire and Messrs. Smith, Knight & Co. and recognized by the company in the agreement transferring the concession, the total cost of the railway and its appurtenances was 26,195,600 pesos which, spread over 470 kms., would give a cost of 55,735 pesos per km.

Even greater controversy surrounds the total amount of the subsidy paid by the government to aid the construction of the line. Estimates vary from 10 to over 50 million pesos but the true figure is probably somewhere between 10 and 30 million pesos. One of the reasons for the confusion is that during the early years of construction the government issued a large but undetermined amount of paper which probably bought far less than its face value on the open market. Apparently Escandón and the company never repaid much of this (probably this was not seriously expected of them). Then, after renewal of the concession in 1867, the government promised an annual subsidy of 560,000 pesos for 25 years but it would appear that it never paid all of this. Another matter for debate
is how much of the money realized from government paper actually went into construction and how much was lost due to corruption and inefficiency.

It is worth noting that the subsidy promised to the F. C. Mexicano in the concessions of 1867 and 1868 was to be paid as a fixed annual amount whereas in all later railway concessions the subsidy was calculated at so-much-per-km. and paid as each allotted stretch was completed. If, however, for purposes of comparison, we take the annual subsidy of 560,000 pesos for 25 years and divide it over the 470 kms. of the line, we may calculate a subsidy of 29,787 pesos per km. Even allowing for the government's probable failure to pay the whole amount of the subsidy, this figure is obviously far in excess of the subsidy paid to later lines. For instance, the F. C. Central from Mexico City to El Paso was promised 9,500 pesos per km. and the narrow gauge F. C. Nacional from Mexico City to Laredo, 6,500 pesos per km. Mexican writers have often commented unfavourably on this contrast but in all fairness it is only right to note that the F. C. Mexicano was the first important railway to be built in Mexico and was therefore
something of an experiment, that it had to contend with a difficult and costly mountain section, that hopes of seeing the line completed had been dashed so many times before that the government was compelled to give the maximum official support possible, even if it were more than was strictly necessary, in order to prevent another delay or failure, that completion of the line to Veracruz was an indispensable prerequisite in order to make the cost of constructing lines from Mexico City into the interior cheaper and finally that the Mexican economy urgently needed railways to aid its development.

(ii) Results of the operation of the Ferrocarril Mexicano

The F. C. Mexicano continued to be a subject of controversy, with criticism being levelled particularly at its subsidy and its rate levels, but at least the line was now open to business and both supporters and opponents could sit back and see what the results of operation would be.\(^9\)

The immediate effect of the opening of the railway was to put a large number of carters, muleteers and stagecoaches on the Mexico City-Veracruz road out of business. However many moved to side routes feeding the
main line of the railway while others found employment with the railway itself. At the same time there was a sudden glut of imported goods in Mexico City as merchants put on sale goods which they had stockpiled at Veracruz in anticipation of the opening of the new line. Indeed so heavy was the initial traffic that the railway became congested, causing considerable delays which forced some merchants to return to the muleteers and carters.

At first the service was restricted to one train per day, a quite inadequate number made unavoidable by the failure of the Fairlie Locomotive Co. to deliver 6 locomotives on time and by the fact that of the 28 locomotives in service, only 6 were sufficiently powerful to haul a normal load of cars; the number of cars per train had to be reduced for the smaller locomotives. Furthermore most of the rolling stock was not new but purchased second-hand and in need of frequent repairs and the 7 Fairlie locomotives already delivered were also in need of repairs owing to mishandling while the line was under construction. To provide a stopgap remedy for these deficiencies, the company quickly bought 4
locomotives, 95 cars and 150 renovated wheels in the United States with which it was able to improve the service but at the price of greatly increased operating costs.

On 15 March, 1873, an agreement was signed between the Minister of Fomento and the Mexican Railway Co. whereby the rates for Mexican products destined for export were reduced to 3 pesos per load; the company committed itself to building an unloading wharf at Vera­cruz, to be owned in perpetuity by the company and agreed to charge 2 pesos for freight until it was completed, and finally the company was authorized to issue mortgage bonds with an interest rate of less than 12% p.a. for the sum of shares not subscribed.

The dock facilities of Veracruz at this time were very inadequate. The existing wharf could only accommodate one ship at a time and was unusable when a North wind was blowing. Consequently most of the loading and unloading had to be done by means of barges, resulting in high handling charges.

As the situation became more stabilized, it could be seen that the greater volume of traffic was towards
the coast but this was comprised mainly of articles of little value and intermediate traffic. The industry most affected by the opening of the F. C. Mexicano was the pulque industry. In the period 1873-75, pulque formed 20% of all freight carried by the new railway; revenue from hauling pulque, which was 248,240 pesos in 1873, rose to 290,344 pesos in 1874, an increase of 42,104 pesos, whilst the amount of pulque arriving by train in Mexico City rose from 34,963,527 litres in 1873 to 38,966,750 litres in 1874. The result was a glut in the capital which caused a sharp drop in prices but the ensuing distress amongst the producers eventually eliminated the inefficient ones and produced a better localization of the industry. At the same time, the railway opened up new markets for pulque such as Orizaba and Veracruz.

The railway was soon carrying an average of 16 tons a day of Mexican products destined for export, of which the most important items were 9 tons of flour, destined for Havana, and cattle feed. The trains also carried wheat from San André’s Chalchicomula and Tehuacán to the mills at Orizaba and stimulated the beginnings of ex-
periments with tropical and semitropical products such as coffee, tobacco and sugar cane in the region of Córdoba. However the agricultural economy needed time to adjust to wider markets and new export opportunities. Mexican industry was in any case still at a very rudimentary stage and so was not greatly affected by the new means of transport. Imports increased but not so much as some enthusiasts had hoped due to the lack of elasticity in demand; the high price of imports caused by customs duties and the adverse silver exchange rate and the low purchasing power of the great majority of the population diminished the effects of lower transport costs. However the railway did produce new categories of imports directly attributable to its own existence, such as railway machinery and equipment, coal, sleepers, etc.

The opening of the F. C. Mexicano obviously had an important effect on the freight traffic between Mexico City and Veracruz, as is evident from contemporary writers and the subsequent development of the line, but to calculate this effect with any accuracy, it is necessary to ascertain the amount of freight carried by
road before the coming of the railway. No reliable statistics exist for this road traffic but in his chapter on railways in Daniel Cosío Villegas's "Historia Moderna de México", Francisco Calderón has tried to estimate it using what evidence is available from contemporary writers. According to this estimate, the freight handling facilities available before the opening of the F. C. Mexicano comprised 350 carts and 1,500 mules. The average cartload was 350 "arrobas" and a mule could carry 16 "arrobas" (1 arroba = 11.502 kg.). Both carts and mules made an average of 8 journeys a year, charging an average freight rate of one peso per "arroba". The estimated annual traffic using these facilities between Mexico City and Veracruz was 980,000 "arrobas" (11,272 metric tons) by cart which paid 980,000 pesos in freight charges and 192,000 "arrobas" (2,208 metric tons) by mule which paid 192,000 pesos. To this should be added 5,990 metric tons at 75 centavos per "arroba" between Mexico City and Puebla which paid 390,666 pesos and 6,295 metric tons at the same rate between Mexico City and Apam which paid 410,625 pesos. This gives a total of 25,765 metric tons paying freight charges of
1,873,291 pesos per year. The approximate nature of this estimate is obvious and in any case it is deficient because of its omission of intermediate traffic but it is possible to suppose the total amount of freight traffic along the route of the F. C. Mexicano before its opening was approximately 30-35,000 metric tons per year.

If we then compare this estimate with the figures for the F. C. Mexicano from 1869 onwards as detailed in Table I and Graphs 1 and 2, the superiority of the railway immediately becomes evident. In 1870, even before the line was opened throughout, the trains carried nearly 79,000 tons of freight and by 1877, five years after the inauguration, freight tonnage had reached over 158,000 tons which represented respectively double and quadruple the tonnage carried by the older methods of transport. At the same time the cost of transport dropped drastically, from nearly 1.9 million pesos to carry approximately 26,000 tons by road to just over 600,000 pesos for 79,000 tons carried by rail.

The receipts from freight traffic increased con-
stantly until 1882 except for a slight decrease in 1876 due to the Revolution of Tuxtepec. On the other hand, the amount of freight carried did not rise constantly nor did it follow the rise in receipts from freight; for example, the tonnage carried decreased from 150,000 tons in 1873 to 122,000 in 1874, yet revenue from freight continued to rise and since there was no increase in freight rates, there must have been more First Class articles carried than in 1873. Similarly revenue from passenger traffic followed a fairly even course while the number of passengers actually carried fluctuated considerably. The number of passengers carried in 1873 and 1874 was quite extraordinary as curious sightseers hastened to try out the novel invention but by 1875 it had declined to little over half the figure of 1873. Yet here again, passenger receipts for 1875 actually increased over those for 1874 and as there was no increase in fares, one can only suppose that proportionally more journeys were being made in First or Second Class than in Third, or that the average length of journey per passenger increased.

In short, the table and graph of the traffic and revenue for the first five years of operation of the F. C. Mexicano present a perfectly respectable picture of a
sober business undertaking. Apart from the easily explicable peak following the opening of the line in 1873, there are no wild fluctuations in either an upward or downward direction. Thus neither the extreme hopes of the supporters nor the extreme fears of the detractors of the line were entirely satisfied. The effect of the railway on the Mexican economy and national life was clearly going to be in the long rather than the short term. Francisco Calderon's conclusion sums up the effect of the opening of the F. C. Mexicano:

In short the progress achieved with the establishment of the Ferrocarril Mexicano was enormous both in respect to the increase in trade between Veracruz and Mexico City and the decrease in freight rates; nevertheless it was not sufficient to satisfy the excessive hopes of those who believed that it would transform the national economy as if by magic nor to quieten the political antagonisms produced by the discussion of the concession of the 11th of November and the electoral struggle.11

However despite this feeling of disappointment in certain circles that the goose had not laid a golden egg, the company continued operations. Some damage was done to the property of the railway in 1876 during the disturbances preceding the overthrow of President Lerdo de Tejada and the decline in traffic and receipts in
1876 may be attributed to the Revolution of Tuxtepec which brought General Porfirio Díaz to the presidential chair, and initiated the period of Mexican history known as the "Porfiriato".

Comparative peace returned to Mexico after 1876, aiding the operations of the F. C. Mexicano and traffic and receipts increased steadily from 1877 to 1882. However there were adverse factors also, such as the inability of the Mexican government to pay the subsidy in full in 1877 and 1878, the attempt by the Veracruz dock-workers to prevent the opening of the company's new wharf there since they feared that it would threaten their jobs and the slight but continued decline in the price of silver which adversely affected the undertaking's earnings in sterling. Thus no dividends were paid on First Preference shares until a 5% dividend was declared in 1879 followed in 1880 by dividends for Second Preference and Ordinary shareholders of 5% and 1/2% respectively (see Table II detailing dividends paid to shareholders).

The returns to the investor in 1879 and 1880 were a reflection of the marked improvement in the company's business in those years. This improvement was due largely
to careful management, a decline in foreign fuel prices, a substantial payment on the subsidy by the government, the long-delayed opening of the Veracruz dock and most important of all, the carriage of building materials for new railways which were being constructed from Mexico City.

In 1880, the F. C. Mexicano embarked briefly upon its Golden Age which lasted until 1882. Total receipts rose from nearly 3.8 million pesos in 1880 to over 6 million in 1882 before declining to 3.8 million again in 1884. This sudden prosperity was almost entirely attributable to the traffic in railway supplies for the two lines which began building out of Mexico City towards the U. S. border in 1880, the F. C. Central and the F. C. Nacional. In 1879, the F. C. Mexicano carried 58,732 tons of freight under this heading, in 1880 it carried 14,739 tons and the total for the years 1881 and 1882 was 84,943 tons. In 1883 it transported 44,391 tons of railway equipment but nearly two-thirds of this was carried in the first six months and as the northern trunk lines progressed further from Mexico City, they began to ship supplies in direct from the United States,
so that in 1884, the Veracruz line carried only 2,331 tons of railway equipment, less than half the figure for 1879.

The improvement in the company's finances, due largely to this exceptional traffic in railway supplies, was reflected in the dividend record of the undertaking. The first dividend on First Preference shares was paid in 1879 and dividends were paid on all three classes of shares in 1880 and the three following years with Ordinary shareholders receiving an unprecedented 23½% in 1882. The improved financial situation of the company and the promise of greater revenues in the future enabled it to raise capital more easily, so that the £265,000 in 8% bonds issued by the company in late 1879 were rapidly subscribed. In 1882, when a total dividend of 23½% was paid, the Ordinary shares were quoted at 147 on the London Stock Exchange. However as the realization gradually dawned that the company's sudden prosperity was due to exceptional circumstances, interest in its shares declined and the quotation for Ordinary shares began to drop in February 1883, reaching 100 in March of that year. The wariness of inves-
tors was increased by the decline in freight receipts which, beginning in 1883, became precipitous in 1884.

The situation of the F. C. Mexicano was indeed becoming uncomfortable for not only were the new lines ceasing to provide it with their traffic, but they also threatened to deprive it of some of its own traffic. The F. C. Central, opened in 1884, and the F. C. Nacional, whose completion was in fact delayed until 1888, promised to siphon off much of the American traffic which, up till then, had passed through Veracruz, whilst the F. C. Interoceánico, which was gradually constructing a rival narrow-gauge line from Mexico City to Veracruz, represented a particularly acute menace. In June 1883, this railway opened a short line from Mexico City to Irolo which attracted some of the older line's pulque traffic; the F. C. Mexicano responded by lowering its freight rates from Mexico City to Irolo in an attempt to gain control of the traffic between these two points.

Other adverse circumstances also affected the F. C. Mexicano's earnings for 1883. An epidemic of yellow fever in Veracruz in the second half of the year kept
shippers away from the port, a drought which reduced the average yield of sugar, grain and other produce outside of Veracruz, the continuing default of the government on the subsidy which it owed the company and on the sum due for carrying government freight and the continued drop in the price of silver combined to reduce the company's sterling receipts by almost £130,000 during the last 6 months of 1883, with the result that the Ordinary shareholders received a much smaller dividend. The company's net receipts for 1884 totalled £16,000 less than in 1883; thus only the First Preference shareholders received a full dividend in 1884 and no dividends were paid to Second Preference and Ordinary shareholders in the second half of 1884.

The F. C. Mexicano, which had been conceived and built amidst the sound of battle, continued to cause controversy throughout this period, largely on account of its rates which were considered by many to be too high. For example, in its issue of 18 September, 1885, the "Railroad Gazette" said that the lowest freight charges from Chicago to Mexico City via the newly-opened F. C. Central were only slightly higher than the rates charged
by the F. C. Mexicano for the much shorter journey from Veracruz to Mexico City. Matías Romero, one of Mexico's leading authorities on railways at that time, attributed the high rates to poor management, the excessive initial outlay caused by the decision to begin construction from Mexico City as well as from Veracruz and abuse of the company's monopolist position and claimed that the high rates were adversely affecting Mexico's export trade. The company replied that the high rates were due to the high operating costs caused by the steep gradients and tortuous line which meant that the locomotives could only haul small loads although their fuel costs were high; maintenance costs were also heavy owing to the effects of tropical rainstorms and falling rocks. There were also other factors not mentioned by the company such as the adverse silver exchange rate, the government's failure to pay its debts and the failure of Mexican agriculture to develop an export trade, which failure was due more to the primitive state of agriculture and the maldistribution of landownership than to high railway charges.

By 1885 the newly-completed F. C. Central had es-
established itself and was undercutting the freight charges of the F. C. Mexicano. The ensuing loss of traffic was a serious blow both to the F. C. Mexicano and to the port of Veracruz and as a consequence the merchants of that city petitioned President Díaz to compel the railway to reduce its rates and to take various other measures to protect the interests of the port. In response Díaz cut the tariff on a few foreign goods, outlined an extensive programme of harbour improvements (although in fact little was actually achieved at this time), promised a vigorous assault on the yellow fever problem at Veracruz and, in late 1887, announced that a London syndicate had agreed to take over the F. C. Interoceánico and finish it under a bonus contract that placed a premium on speed.

The F. C. Mexicano then cut its freight rates by approximately 18% with particularly drastic reductions being made on the First and Second Class freight hauled along the entire route from Veracruz to Mexico City. The F. C. Central cut its rates even more drastically but in 1886 and 1887, the value of the freight passing through Veracruz increased for the first time since the
F. C. Central was opened to traffic. However the record of the F. C. Mexicano from 1885 to 1892, when the last major line in Eastern Mexico to be built during the Porfiriato was completed, shows that the lowering of the freight charges did not bring back the high returns of the early 1880's. The amount of goods, by weight, hauled on the F. C. Mexicano increased after 1884 but the annual revenue from freight in the years from 1885 to 1892 did not again reach the level attained in 1881 or 1882. Nor did the total receipts, for the lowering of the freight rates and the slow increase in passenger travel combined to keep them at a relatively low level. Furthermore the increase in freight hauled between 1885 and 1892 was again largely attributable to the traffic in railway supplies occasioned by the construction of the F. C. Interoceánico and the F. C. Mexicano del Sur. In 1884 the F. C. Mexicano carried 2,331 tons of railway equipment but this had risen to 54,723 tons in 1889 and to 68,813 tons in 1890. However this traffic would obviously not form a permanent source of income.

From the mid-1880's and especially after 1890,
the F. C. Mexicano was experiencing increasing competition from the other main railways in Mexico. This competition culminated in an open rate war from June to August, 1892, which was followed by a series of pooling agreements involving two or more of the F. C. Mexicano, F. C. Interoceánico, F. C. Central and F. C. Nacional. These will be discussed in more detail in a later chapter but they will be briefly enumerated here for the sake of completeness. The first agreement to pool freight receipts, involving all four railways, lasted from August 1892 to June 1895 when the F. C. Central again resumed the rate war. Between September 1895 and October 1896 the F. C. Mexicano and the F. C. Interoceánico operated a temporary pool between themselves. This was replaced in October 1896 by a new pooling agreement involving all four railways which was renewed in 1899 and 1902, halted in 1903, resumed in 1905 and still used with slight modifications in 1910 at the end of the Porfiriato.

Passenger and freight traffic increased steadily between 1892 and 1900, exceeding all previous levels reached in the earlier history of the line. However this
increase was not fully reflected in the company's receipts since the increase in traffic was not sufficient to compensate for lower rates, especially on freight, caused by the competition from other lines after 1892. There was a large increase in the earnings in pesos in 1902 but this was not reflected in the payment of dividends owing to increased working costs caused mainly by the rise in wages from 1892 to 1902 and the decrease in net profits in sterling, which were £158,000 less in 1902 than in 1892, due to the continued fall in the price of silver. The price of silver was 35% lower in 1892 and 50% lower in 1902 than in 1876. There is also the suspicion that overcapitalization, high construction costs and bad management may also have reduced the profitability of the concern.

In the first decade of the 20th century, which proved to be the last of the Porfiriato, Mexico's foreign trade expanded phenomenally, the value of her exports and imports rising from 291,029,000 pesos in 1900 to almost 500,000,000 pesos in 1910. The F. C. Mexicano naturally participated in this great expansion of trade. Passenger traffic grew at an increased rate from 1902 to
1910 and the line carried 75% more freight, measured by tonnage, in 1910 than in 1902. The greater proportion of the increased traffic receipts came from carrying goods originating outside Mexico such as coal, dry goods, hardware, machinery, liquor, etc. It is noteworthy that although most of these imported goods continued to go to Mexico City, an increasing proportion was unloaded at intermediate stations, suggesting that the prosperity of the Porfiriato in its last years was beginning to spread into the provinces. At all events, this prosperity had a favourable effect on the finances of the F. C. Mexicano and in 1907, 1908 and 1909 full dividends were paid to the First Preference shareholders for the first time since 1890; dividends of varying amounts were paid to the Second Preference shareholders from 1906 to 1910 and in the latter year a small dividend was paid to the Ordinary shareholders for the first time since 1891.

The affairs of the F. C. Mexicano in the early years of the 20th century were affected by a number of factors besides the rapid increase in Mexican commerce. Chief amongst these were the thorough modernization of
the port of Veracruz between 1895 and 1902 by the contracting firm of Weetman Pearson, Mexico's adoption of the gold standard in 1905 which caused an immediate rise in the quotation of Mexican Railway Co. shares in London and the organization of the "Ferrocarriles Nacionales de México" which took over and consolidated the systems of the F. C. Nacional, F. C. Internacional and F. C. Central in 1909.

Throughout the period under discussion, the railway had not greatly increased its physical assets. After an unfortunate experience in the 1870's with the acquisition of Ramón Zangronis's branch from Veracruz to Jalapa, a bad bargain which the company was later happy to rid itself of, the F. C. Mexicano devoted itself entirely to the operation of its main line and the Puebla branch, eschewing the generally expansionist attitude of the two main northern lines, the F. C. Central and F. C. Nacional. Naturally the Veracruz railway benefitted from the general expansion of the Mexican railway system after 1880 and the successive improvements to the dock facilities in the port of Veracruz also aided its operations, but its own activities were
restricted to the opening of a small number of branches to serve as feeders to the main line. The most important of these was the 46-km. branch from Ometusco to Pachuca built under a 99-year concession granted on 12 April, 1889, and opened on 20 December, 1890. This line was steam-powered in contrast to the 8-km. branch from Santa Ana to Tlaxcala which was operated with animal traction (i.e. mules). This line was built under a 99-year concession granted on 11 December, 1882, and acquired by the F. C. Mexicano on 30 April, 1900. In the early years of the 20th century the company also built or acquired a few narrow gauge branches which served as feeders.

The development of the company is also reflected in the increase in its rolling stock. When the line opened in 1873, it owned 26 locomotives, 36 passenger coaches and 341 freight cars; in 1890 it had 56 locomotives, 73 coaches and 603 freight cars; in 1903 the figures were 72 locomotives, 82 coaches and 945 cars, in 1904, 82 locomotives, 75 coaches and 1,051 cars, and in 1909, 83 locomotives, 75 coaches and 1,265 cars.

In conclusion, therefore, the situation of the
F. C. Mexicano in 1910 may be described as "satisfactory". The undertaking had proved to be neither an Eldorado nor a white elephant and generally bore most of the marks of a reasonably sound business venture. Conceived as a pioneering enterprise, it had opened an efficient channel of communication into the interior and had inaugurred the Railway Age in Mexico. Subsequently, it had been content to develop business through its existing facilities but it had managed to establish itself sufficiently firmly to withstand the competition not only from railways in other parts of Mexico but also from a direct rival on the Mexico City-Veracruz route (the F. C. Interoceánico). Proof of the basically healthy situation of the railway is the way it held aloof from the consolidation of the northern lines which led to the formation of the Ferrocarriles Nacionales de México. Criticism of the F. C. Mexicano had by this time become virtually a national institution in Mexico but as one writer, Mariano Téllez Pizarro, said in 1904: "This is one of the railways which provides a better service".12
Notes


2. The story of the building of the F. C. Mexicano is told in detail in Cosío Villegas, op. cit., II, pp. 608-61, and David M. Pletcher: "The Building of the Mexican Railway", HAHR, III, pp. 26-62. This chapter is indebted to both these works.

3. Pletcher, op. cit.; Cosío Villegas gives 10% of the "derecho de mejoras materiales".

4. Pletcher, op. cit.; Cosío Villegas gives 20% of the "derecho de mejoras materiales".

5. Pletcher, op. cit.; Cosío Villegas gives 75 years.

6. Pletcher, op. cit.; Cosío Villegas gives 20% of the "derecho de mejoras materiales".


9. Material for this section has been drawn largely from Cosío Villegas, op. cit., II, pp. 661-70, and Alfred Tischendorf: "Great Britain and Mexico in the Era of Porfirio Díaz" (Durham, N. C., 1961), pp. 31-63.


II. THE NORTHERN TRUNK LINES -- F. C. CENTRAL, F. C. NACIONAL AND F. C. INTERNACIONAL

The F. C. Mexicano was, in a way, the product of Mexico's traditional economic structure, responding as it did to her historical orientation towards trade with Europe, most of which passed through the port of Veracruz. However, by the second half of the 19th century, the United States had begun to emerge as a dynamic and powerful industrial nation and it was inevitable that American capitalists and industrialists should begin to look south of the border for sources of cheap raw materials and potential markets for manufactured goods. Equally inevitable was the fact that this interest should be partly expressed in projects for railway lines to link Mexico with the rapidly expanding railroad system of the United States.

Nevertheless, there still remained many obstacles to railway construction in Mexico even after the completion of the F. C. Mexicano. The main liabilities, from the American investor's point of view, were enumerated in the reports of John W. Foster, the U. S. Minister to Mexico in the late 1870's. He cited, in particular, Mexico's reputation for political instability.
and as a bad credit risk, the poverty of the majority of the population and the barrenness of much of the land and, finally, the likelihood that any railway built would need a subsidy which, in all probability, the Mexican government would be unable to pay in full.

The Mexicans themselves were not wholly enthusiastic about the idea of closer links with the United States. Strong opposition developed in Congress and the press when the first proposals for lines to the U. S. border were made in the 1870's, and the President at this time, Lerdo de Tejada, if not wholly opposed to the projected railways, was at least unwilling to back them publicly. Indeed, history has attributed to him the remark: "Between the strong and the weak, the desert". Mexico had lost almost half her national territory to the United States in 1848 and so it is scarcely to be wondered that American-sponsored railway projects aroused fears of further annexation. The dissenters were especially opposed to connections with the U. S. railroad system, which they saw as a direct threat to the future of the northern states of Mexico.
Despite these obstacles, however, American railway promoters were active in Mexico from the late 1860's and throughout most of the 1870's Congress and the press were engaged intermittently in discussing the rival projects of the flamboyant William S. Rosecrans and the more retiring Edward Lee Plumb. The plans of both promoters were dressed up as schemes for "interoceanic" lines (i.e. lines to join the Atlantic and Pacific Oceans, usually involving a connection with the F. C. Mexicano at Mexico City) with, incidentally, a branch to the U. S. border. The projects which were eventually approved and constructed were also presented under the same guise but it is doubtful whether the promoters were seriously interested in the interoceanic line, at least, as a primary objective. Certainly nobody was deceived as to the true import of the proposals and they raised a corresponding uproar, replete with predictions of foreign intervention and threats of annexation which the assurances of the promoters were unable to quieten. Rosecrans added to his difficulties by insisting upon adopting a narrow gauge for his proposed railway. This was essential in order to make connection with the U. S.
Denver & Rio Grande railroad and its subsidiaries, which provided the main backing for Rosecrans, but for Mexico it raised the problem of a diversity of gauges on a large scale (hitherto, narrow gauge lines in Mexico had been confined to minor railways). Informed and uninformed opinion was divided on the issue and a veritable "battle of the gauges" took place with economy in construction and operation being weighed against the inconveniences of a break of gauge. Finally, the interests represented by Rosecrans won the day and the future F. C. Nacional was built to the narrow gauge, but both Mexico and the railway were later to regret the victory and eventually a costly conversion to standard gauge was undertaken. In the meantime, however, both projects were rejected.

Opposition to American-sponsored railways continued unabated and the various proposals for lines to the U. S. border failed to progress beyond the paperwork stage until 1880, in which year concessions were granted to three undertakings, the F. C. Central, F. C. Nacional and F. C. de Sonora. The reason for this change of heart was basically the altered political situation in Mexico. The
country was as desperate as ever for railways, particularly lines which would link the isolated northern states to the more populous central region of the country, and was also eager to develop foreign trade. But now, after 4 years in power, Díaz had consolidated his position and was able to secure authorization from Congress to make the necessary contracts as he thought best, with certain stipulated limitations. The more stable political situation in Mexico encouraged the American investors, who foresaw an opportunity to win new markets and sources of raw materials in Mexico, whilst the U. S. railroad systems had now actually begun to reach the border and were anxious to obtain outlets to the south as part of their bitter internecine rivalry. The Southern Pacific reached Yuma, Arizona, in 1877 and El Paso, Texas, in 1881; the Santa Fe arrived at El Paso in 1881 and at Nogales, Arizona, in 1882; the International & Great Northern was built to Laredo, Texas, in 1882 and the Galveston, Houston & San Antonio reached Eagle Pass, Texas, in 1883. The narrow gauge Texas-Mexican was completed between Corpus Christi, Texas, and Laredo in 1881.
Three railways therefore obtained concessions from the Mexican government in September 1880 and began building immediately. The F. C. Central's line ran from Mexico City via Querétaro, Salamanca, Irapuato, Silao, Aguascalientes, Zacatecas, Torreón and Chihuahua to Paso del Norte (otherwise known as Ciudad Juárez), opposite El Paso, Texas; it was 1,970 kms. long and was completed in March 1884. The F. C. Nacional built its narrow gauge (914 mm. or 3 ft.) line from Mexico City on a more easterly route via Toluca, Maravatío, Acámbaro, San Luis Potosí, Saltillo and Monterrey to the U. S. border at Laredo; work progressed more slowly than on the F. C. Central and was suspended altogether during 1885 and 1886 but, nevertheless, the entire line, 1,351 kms. in length, was inaugurated in November 1888. The F. C. de Sonora built 422 kms. of track from Guaymas on the Gulf of California to the U. S. border at Nogales, completing the work in October 1882.

Meanwhile, in June 1881, another American company obtained a concession for a line between Mexico City and the U. S. border, together with an interoceanic line. This was the F. C. Internacional which, beginning work
southwards from the border at Piedras Negras, managed, in the event, only to reach Torreón, in 1888, and Durango, in 1892, making connection on the way with the F. C. Nacional and F. C. Central.

American trade with Mexico expanded rapidly during the period lasting from the end of the French intervention in 1867 to the overthrow of Porfirio Díaz in 1911. During that time, the annual commerce of the United States with Mexico increased from about $7,000,000 in 1867 to $117,000,000 in 1911 so that by the end of the Porfiriato, the United States accounted for more of Mexico's foreign trade than all the European countries put together. American investment in Mexico increased proportionally and during the first decade of the 20th century, Mexico received between one-quarter and two-fifths of all U. S. direct investments abroad. As David M. Pletcher says: "By 1911 Mexico was truly an economic satellite of the United States."^5

The northern trunk lines participated in this vast expansion of commerce. For example, railways accounted for $644,300,000 out of the total estimated U. S. investments in Mexico in 1911 of $1,044,600,000, a pro-
portion of 61.7%. But the railways also encountered many problems, which will be discussed in later chapters. Thus they were unable to benefit fully from the peace and prosperity of the Porfiriato and were forced into a potentially-productive consolidation in the years immediately preceding the cataclysm of the Revolution.

(i) The Battle for the Concessions

Projects for lines to the U. S. border and proposals for concessions sponsored by American promoters had been under consideration throughout the 1870's and had caused a corresponding furore in both Congress and the press. Now, as the closing years of the decade heralded the end of Díaz's first presidential term, attention came to be focussed on three projects which were eventually to result in the building, respectively, of the F. C. Central, F. C. Nacional and F. C. de Sonora. 7

The F. C. de Sonora is outside the scope of this work since the line which it built from Nogales to Guaymas was later incorporated into the Southern Pacific line to Guadalajara, and today forms part of the F. C.
del Pacífico, but it is important to mention it since all three concessions were usually considered together and the arguments applied to one were generally applied to the others as well. The F. C. de Sonora, in particular, aroused opposition because, it was said, a railway linking Sonora to the railroad system of the United States before the state was connected by rail with Mexico City would mean the virtual American annexation of Sonora and Chihuahua. Even a modification stating that the company and its employees were to be considered as Mexicans and expressly forbidding foreign diplomatic intervention on its behalf failed to allay these fears. Consequently, the contract which had been signed between the government and the concessionaires on 12 October, 1877, was eventually rejected by Congress in 1879.

Shortly after making the contract with the proposed F. C. de Sonora, the Minister of Fomento signed a contract, on 12 November, 1877, with the undertaking of William Palmer and James Sullivan, the representatives of the American Denver & Rio Grande railroad and the heirs of the Union Contract which had initially been
represented by William Rosecrans. This contract was for the construction of a narrow gauge railway and a telegraph line from Mexico City to the Pacific coast and to the U. S. border on the Rio Bravo. The contract was approved by the congressional Commission on Industry on 19 November, 1877, and discussion of it then began in Congress on 4 December, 1877, lasting, with interruptions, until May 1878.

One of the main arguments brought forward during the congressional debate to oppose the project was, again, the danger to Mexican sovereignty and territorial integrity involved in linking the northern states of Mexico to the United States before they were joined by rail with the federal capital and in granting a subsidy which it might prove impossible to pay fully, thus providing a pretext for later American intervention. Another argument stressed the possibility that the advantages accruing to Mexico from the interoceanic line, which, it was hoped, would carry through traffic from Europe to the Far East via the F. C. Mexicano and Mexico City, would be destroyed by the branch to the U. S. border which would cause traffic to and from the Pacific port to use ports on the At-
Atlantic seaboard of the United States and the U. S. narrow gauge lines rather than transfer to the standard gauge F. C. Mexicano at Mexico City. Speeches were also made about the predatory attitude of the United States towards Mexico and the danger that the new undertaking would constitute an excessively powerful influence in Mexican domestic politics, as indeed, the F. C. Mexicano sometimes did.

Finally, to break the deadlock at the end of the Spring 1878 session, Congress authorized the Executive to make a contract during the recess for the construction and operation of an interoceanic line, being careful to safeguard the rights and concessions of the states in the process. The matter was turned into a vote of confidence in Díaz and approved by a large majority. Nevertheless, Congress elected Chavero, one of the main opponents of the concession, as its president and postponed discussion of the matter indefinitely, until another project was presented in August 1880.

Meanwhile, in 1880, a new project was proposed by another American company which called itself the Mexican
Central. This was formed by a group of Boston businessmen with the purpose of building and operating a railway in Mexico and was backed by the Atchison, Topeka & Santa Fe interests. The new scheme suggested a route from Mexico City to the U. S. border running through the centre of the country via Querétaro, Celaya, Salamanca, Irapuato, Guanajuato, Silao, León, Lagos, Aguascalientes, Zacatecas, Durango and Chihuahua, with branches to Salvatierra, Dolores Hidalgo, Guadalajara, San Luis Potosí and a point on the Pacific coast. The founders claimed a capital of $1,000,000 at the time of registration, March 1880, although, in fact, $16,000,000 were later subscribed, and as the company contained many prominent businessmen amongst its directors and founders, it soon received requests for subscriptions totalling more than $5,000,000. The documentation of the company's financial resources and the request for a concession were presented to the Mexican government through Manuel María de Zamacona, the Mexican minister in Washington, but to save time, the promoters decided to request the transfer to the F. C. Central of the concession of 5 December, 1874, now cancelled, for the construction of a
railway between Mexico City and León, together with a proposal for a modification to this concession extending the line to Paso del Norte with branches to Guadalajara and San Luis Potosí.

Opinions were again divided as the transfer came up for approval in Congress and so, as it was obvious that the congressional session would end without any definite decision being reached, Congress authorized the Executive by the decree of 1 June 1880 to make a definite contract and to grant a concession to the company or companies which offered the greatest advantages, whilst safeguarding the rights of the states obtained through earlier concessions. The decree forbade the Executive to include arrangements regarding the English debt while negotiating the railway concessions, stipulated the eventual reversion of the railway to the Mexican nation free of all charges and set the following maximum rates: for passengers per km., 0.03 pesos First Class, 0.02 pesos Second Class and 0.015 pesos Third Class, and for freight per metric ton, 0.06 pesos, 0.04 pesos and 0.025 pesos respectively for the three classes; these charges were to be revisable every 5 years.
The F. C. Central considered the concession, for the Mexico City-León section at least, assured and so resumed the construction work which had been begun by the earlier concessionaires. The Sullivan concern, meanwhile, announced its intention to buy the concession and the sections already built of the Ferrocarril de Toluca in order to incorporate it into their proposed system. But they also decided not to compete with the F. C. Central and sought a different route, through the states of Mexico and Michoacán for the interoceanic line and from Acámbaro to San Luis Potosí and Laredo for the international line.

The government named an assessment committee to study the various proposals and then granted similar concessions for three lines. The concession for the F. C. Central, which included a line through the centre of the country from Mexico City to the U. S. border at Paso del Norte, was granted on 8 September, 1880. The Compañía Constructora Nacional Mexicana, which built the F. C. Nacional along a more easterly route from Mexico City to the border town of Laredo, received its concession on 13 September, 1880. Finally, on the fol-
lowing day, 14 September, 1880, the F. C. de Sonora obtained its concession for a line from the U. S. border to the port of Guaymas on the Gulf of California.

The terms of the three concessions were basically similar although, naturally, they varied in details respecting such things as routes, time limits, subsidies, etc. The F. C. Central's concession stipulated that the Mexico City-León line was to be completed by the last day of 1882, that work was to start on the Paso del Norte and Pacific coast lines within 4 months of the inauguration of the León line, beginning the Pacific line from both ends and working on both sections at the rate of 400 kms. every 2 years, and that the Pacific line should be completed within 5 years and the Paso del Norte line within 8 years of the date of inauguration of the León line. The Constructora was to hand over 450 kms. of track every 2 years, finishing its interoceanic line in 5 years and its route to the northern border in 8 years. The F. C. de Sonora was to build 50 kms. in the first 10 months and then 200 kms. every 2 years until it linked Guaymas and Hermosillo with the U. S. border. 

Each of the new railways was granted a subsidy:
9,500 pesos per km. for the F. C. Central; 7,500 pesos per km. on the Pacific line and 6,500 pesos per km. on the line to the border for the Constructora; and 7,000 pesos per km. for the F. C. de Sonora. To realize the subsidy, the government would issue obligations without interest for an amount equal to the subsidy, redeemable with 6% of the duties collected in the customs houses in the case of the F. C. Central and with 4% in the case of the Constructora. The F. C. de Sonora was to receive cash. The maximum rates for passengers and freight were laid down but no limit was placed on the issue of bonds or mortgage obligations by any of the three companies.

The Constructora was permitted to use the narrow gauge of 914 mm. (3 ft.) but the other two lines were to be standard gauge.

Díaz presented a report to Congress on the use he had made of the authorization to contract for the construction of railways. The report was discussed by Congress and approved unanimously on 8 November, 1880. The position of the three railways was thus secured and they were able to commence construction immediately.
(ii) Ferrocarril Central Mexicano: Mexican Central Railway

The Ferrocarril Central Mexicano received its concession on 8 September 1880 but it had already begun construction on 25 May of that year in anticipation of the approval of its request. Work was now carried on vigorously starting at both ends, at Mexico City and at Paso del Norte, and the section from Mexico City to Tula, almost 100 kms. in length, was inaugurated on 15 September, 1881. This part of the line was extended to San Juan del Río, 97 kms., on 1 December 1881; to Querétaro, 54 kms., on 16 February, 1882; to Irapuato, 108 kms., on 1 May, 1882; and to León, 63 kms., on 28 July, 1882. Meanwhile at the northern end, the section of 360 kms. from Paso del Norte to Chihuahua was opened on 16 September, 1882, whilst the branch from Silao to Guanajuato, 23 kms., was completed on 21 November, 1882. The line was extended northwards from León to Lagos, 59 kms., on 1 May, 1883 and the section from Jiménez to Villa Lerdo, near present-day Torreón, 232 kms., was finished on 11 September, 1883. Meanwhile the southern part of the line continued to advance northwards,
reaching Aguascalientes, 109 kms. from Lagos, on 21 September, 1883; Zacatecas, 120 kms., on 22 December, 1883; and Estación de Fresnillo, 57 kms., on 1 February, 1884. The gap between Estación de Fresnillo and Villa Lerdo was then closed and the last spike was driven on 8 March, 1884, near Fresnillo at Kilometre 764, measured from Mexico City, thus completing the 1,970 kms. of the main line of the F. C. Central.

The first train to traverse the entire line left Mexico City on 22 March, 1884, and travelled to Chicago over the tracks of the F. C. Central and the Atchison, Topeka & Santa Fe, Hannibal & St. Joseph, and Chicago, Burlington & Quincy railroads.

The Mexicans were astonished at the speed with which the F. C. Central was constructed, especially when they compared it with the time taken to build the F. C. Mexicano. The entire line from Mexico City to Paso del Norte was 1,970 kms. long and was constructed in 3 years, 9 months and 13 days or, in other words, in 1,388 days, which gave an average of 1.5 kms. per day, including holidays and the periods when construction was halted by physical obstacles. It is interesting to note
that, in contrast to most American and American-owned lines, the F. C. Central was built without recourse to the formation of a construction company.

Meanwhile, by a decree of 12 April, 1883, the various concessions acquired by the company were consolidated under the terms of the concession of 8 September, 1880, with the exception of routes, time limits, etc. Further modifications were made in 1886 and subsequent years.

The F. C. Central's main effort was concentrated on the line from Mexico City to the U. S. border and work on the interoceanic line proceeded much more slowly. Work began on the Aguascalientes-San Luis Potosí-Tampico section at Tamos, near Tampico, on 13 July, 1881, and 76 kms. of line were completed by the end of 1882. 90 kms. were finished by April, 1883, and another 25 kms. by 28 December, 1883, giving a total of 115 kms. The total length of the line reached 142 kms. in 1884 and 166 kms. in 1888 at which time the line extended from Tampico to Valles. Competition from the recently-completed F. C. Nacional then forced the F. C. Central to hasten construction on the unbuilt section between
Valles and its main line at Aguascalientes and the line from Tampico was extended as far as San Luis Potosí in 1889. The whole line from Tampico to a junction with the main line at Chicalote, 654 kms. in length, was completed in mid-1890, being later extended another 14 kms. to the city of Aguascalientes. Meanwhile, to improve the harbour facilities at Tampico, the F. C. Central contracted with the government for the construction of a port and the dredging of the bar at a cost of 4,000,000 pesos.

On 31 March, 1881, the company announced that surveying for the line to the Pacific was about to begin and after approval of the route selected had been obtained, construction work began at the port of San Blas on 30 March, 1883. A section of 25 kms. as far as Huarestemba was completed by April 1884, but after another 2 kms. were built, work was suspended. Preliminary surveys were carried out on the Irapuato-Guadalajara section of the line but no construction work was undertaken until 1887. Then, on 2 May, 1887, work began at Irapuato and by the end of that year, the line had reached La Piedad. It reached Ocotlán, a distance of 180 kms., in March 1888.
and was completed to Guadalajara, 259 kms., in April 1888. The company, however, was reluctant to build the line on to Nayarit and it secured a deferment of the limits on 5 July and 11 December, 1886, and again 6 years later in 1892. Finally it obtained its objective of being relieved of the obligation to extend the Guadalajara line to the Pacific coast and it also recovered back the money which it had deposited to guarantee construction.

Meanwhile, the F. C. Internacional extended its main line to make a junction with the F. C. Central on 1 March, 1888, thus affording the latter concern an outlet to the United States through Piedras Negras which was almost as far east as that of its main competitor, the F. C. Nacional. Consequently, by 1890 the F. C. Central was in a strong position. It was standard gauge and therefore accessible to through running with other Mexican and U. S. lines, it had two outlets to the United States through Ciudad Juárez (formerly Paso del Norte) and Piedras Negras, it possessed a line to the Gulf Coast at Tampico and another of its lines served the second largest city in Mexico, Guadalajara.
Therefore, for a while, the company relaxed and was content to consolidate its position. Between 1890 and 1895, only 70 kms. of new track were built and these were entirely comprised by the line from Tula to Pachuca, the concession for which was granted to Sebastián Camacho and General Felipe Berriozábal, acting as agents of the F. C. Central, on 20 December, 1889, and formally transferred by them to the latter concern a few months later. The concession permitted the company to extend the line as far as Tampico or Tuxpan and promised a subsidy of 8,000 pesos per km., payable in bonds delivered at nominal value with interest of 5% p.a. The line was completed as far as Pachuca, a distance of 70 kms., in 1892 but the continuation to Tampico required large sums of capital and so the company secured deferments in 1892 and 1895, at the cost of having the subsidy converted into amortizable interior debt bonds. Finally, on 14 September, 1898, it renounced the right to build the line from Pachuca to Tampico altogether. Nevertheless the line from Tula to Pachuca was useful since it gave the F. C. Central a shorter route to Veracruz via the Ometusco-Pachuca branch of the F. C. Mexicano.
In 1895, the F. C. Central again resumed construction, this time of branches and feeders instead of main lines. The company was empowered to build a line from Guadalajara to Ameca, as well as a branch to Tequila, by a concession granted on 17 December, 1895; this concession was almost identical to that of the F. C. Central except that the subsidy was to be paid at the rate of only 2,000 pesos per km. in amortizable interior debt bonds. Work began in mid-1896 and the branch, with a length of 89 kms., was completed in January 1897.

In the following year, on 14 September, 1898, the F. C. Central obtained the concession for a line from Guadalajara to the port of Manzanillo on the Pacific coast. The company was empowered to begin the line from a point on the Irapuato-Guadalajara line or from Ameca and was also authorized to build and operate a line from the station of La Vega, on the Ameca line, to San Marcos; both lines were to receive subsidies, of 8,000 pesos per km. for the former and of 6,000 pesos per km. for the latter. The line from La Vega to San Marcos, 46 kms. in length, was completed in December 1900. The Manzanillo line reached Tuxpan (Jalisco), 192 kms. from Guadalajara,
in November 1901, but the company was then forced to suspend construction for lack of capital and was thus unable to comply with the time limits. The government, which was acting with severity at that time, cancelled the concession and the company lost the guarantee deposit, but the government immediately granted another concession with a subsidy of 12,500 pesos per km. in 5% bonds to a subsidiary of the F. C. Central called the "Ferrocarril Central al Pacífico". This undertaking obtained another deferment of the time limit but finally the line was completed and the first train reached Manzanillo in October 1909.

Another line built by the F. C. Central was the Michoacán branch. On 16 August, 1888, a concession to link Maravatío and Iguala was granted to Sebastián Camacho; in July 1896, this concessionaire obtained a new route, from La Piedad to Ario, via Zamora, Uruapan and Taretan but, in fact, the line as built began at Yurécuaro. Work started in July 1897 and the line reached Chavinda, a distance of 41 kms., by the end of 1897. On 14 September, 1898, the concession was recast with that of the F. C. Central, except that the subsidy was
to be only 6,000 pesos per km., payable in 5% amortizable interior debt bonds; however the subsidy was only to be paid on 190 kms., even if the line turned out to be longer. By the end of 1898, 90 kms. of track had been laid between Maravatío and Zitácuaro, with a 4-km. branch to Angangueo and a 1-km. branch to Trojes.

A concession to build a railway without a subsidy between Lerdo and San Pedro de las Colonias in the state of Coahuila was granted to Manuel Marroquín and Gilberto Montiel on 3 June, 1893. The time limits lapsed and the concession was transferred to the F. C. Central which obtained a deferment. In 1897, the F. C. Central obtained the right to issue shares, bonds and debentures for this line, which could also be mortgaged; however, the company could not have this concession incorporated into its own. The F. C. Central built 25 kms. of track in 1896 and completed the line of 63 kms. in 1897.

In June 1896, the F. C. Central acquired the concession for the Lampazos-Jiménez-Sierra Mojada line in the state of Chihuahua from the British Mexican Railway Co. which had acquired it in 1893 from Enrique Baz who
in turn had been granted the concession for the line in March 1888. The concession promised a subsidy of 8,000 pesos in bonds at 90% of their nominal value with 6% interest; the line carried mainly mineral traffic. Before this acquisition, the F. C. Central had purchased, in September 1895, the concession for the line from Jiménez to Hidalgo del Parral which had been granted to Andrés Horcasitas and David Shaw on 15 December, 1894, with the promise of a subsidy of 3,000 pesos per km. in land promissory notes ("vales de tierra") without interest. The transfer of both these concessions was approved by the government which decreed that the terms of the F. C. Central's own concession were to apply to both lines and that the subsidy was to be 8,000 pesos per km. for 141 kms. and 3,000 pesos per km. in "vales de tierra" without interest for the remaining distance. Work began in 1897 and 84 kms. were finished by the end of the year. The line from Jiménez to Parral was completed in early 1898 with a length of 84 kms. but a deferment was obtained for the Sierra Mojada stretch.

The length of the F. C. Central system was slightly reduced in 1896 when 5 kms. of the Guanajuato branch were
transferred to the local transport undertaking and the railway company was obliged to return 20,000 pesos received as part of the subsidy. On 14 September, 1898, the undertaking renounced its right to construct and operate the system of the F. C. Carbonífero de Oaxaca, the concession for whose 80-km. line it had acquired by transfer. Between 1898 and 1903, the F. C. Central also acquired the line from San Bartolo to Río Verde which was 37 kms. in length.

Besides these lines, which it built on its own account, the F. C. Central also acquired a number of lines whose construction had been begun or for which concessions had been obtained by other parties. The most important of these was the Ferrocarril Monterrey al Golfo, running from Monterrey to the port of Tampico, which was acquired in 1901. In the following year, the F. C. Central took over the partly-constructed Ferrocarril de México a Cuernavaca y el Pacífico and in April of the same year, 1902, it also purchased the property and concession of the Pachuca-Tampico line, which it received in a similar state. These purchases were followed by the acquisition of the Ferrocarril de Coahuila al Pacífico.
in 1905.

The original concession for the F. C. Monterrey al Golfo was granted on 10 November, 1887, to General Gerónimo Treviño and Emeterio de la Garza for the construction of a narrow gauge line from Monterrey to Tampico or Laguna Madre. It stipulated a time limit of 10 years, a subsidy of 5,000 pesos per km., payable in bonds issued at 90% of their nominal value with 6% interest p.a., and gave permission for the company to charge higher rates during the period of construction and the first 3 years of operation. Treviño and la Garza had requested this concession as a speculative venture and they then proceeded to offer it to groups of American capitalists. However, the narrow gauge of the line proved to be an obstacle and so, in August 1888, the concessionaires obtained authorization for standard instead of narrow gauge and an increase in the subsidy of 3,000 pesos per km. The concession was then acquired by "The Monterrey and Mexican Gulf Railroad Company" which was formed for this purpose. In June 1889, the company obtained permission to extend its line beyond Monterrey, which was served only by the narrow gauge
F. C. Nacional, to a junction with the standard gauge F. C. Internacional.

Work began immediately from three places, Tampico, Monterrey and a point on the F. C. Internacional which was named Estación Treviño, and the line of 625 kms. was completed in January 1892. Traffic, however, did not come up to expectations for the line traversed a poor area and there was virtually no traffic on the Monterrey-Tampico section whilst the branch to Treviño could not support the operating expenses of the whole line.

The company was therefore forced to contract numerous debts, the most important of which was a loan obtained on the Belgian market with a first mortgage guarantee. The situation became critical in 1895 when the receipts in silver were not sufficient to cover the mortgage interest, which was paid in gold, and although the company obtained approval for the continuation of its high rates for another year, it was forced to declare bankruptcy. The mortgage creditors then organized themselves under the name of "Société Anonyme Belge des Chemins de Fer au Mexique" but the line which they acquired was in very poor condition. No mainten-
ance had been done on the track or equipment, the bridges were temporary structures and the other creditors were pressing. The mortgage creditors obtained another extension of the high tariffs in 1896 and the situation improved slightly in that year, but in 1901 they sold the line to the F. C. Central which thus obtained a more direct route to Tampico from the north.

The F. C. de México a Cuernavaca y el Pacífico project for a line from Mexico City to Acapulco was not new and by 1898 it had 254 kms. of line constructed between Mexico City and a point beyond Puente de Ixtla. In the same year, 1898, a company was formed with capital from the American mid-west totalling 6,000,000 pesos, of which 2,432,000 pesos were fully paid up so that the financial situation of the undertaking seemed quite sound. The government had not originally granted a subsidy to the Mexico City-Cuernavaca line but the company acquired the concession of the Izucar de Matamoros-Acapulco line and by a decree of 31 December, 1895, inherited the subsidy promised to the latter for a distance of 380 kms. at the rate of 12,000 pesos per km. The concessionaires also made a series of financial arrangements by which
the National Bank and the Bank of London acquired the bonds issued by the railway at par and lent on current account with the pledge of the subsidy and mortgage bonds. The government guaranteed the operation so that on converting the subsidy in cash into 5% bonds, the company, in effect, obtained a subsidy of 23,850 pesos per km., compared with the cost of construction of 39,000 pesos per km. The undertaking was thus able to construct another 38 kms. as far as the Río Balsas in 1899.

The company then realized that the project was beyond its resources owing to the scarcity of local traffic, the high operating costs caused by the steep gradients and the very difficult terrain on the remainder of the proposed line to Chilpancingo and Acapulco. It therefore obtained the authorization of the government to change its route to follow the course of the Río Balsas as far as its mouth and then turn back to Zihuatanejo and Acapulco; this route was longer but it had much easier gradients. The government, however, refused to increase the length of line to be subsidized and obliged the company to build a branch from Acapulco to
Chilpancingo with the small subsidy of 5,000 pesos per km., payable in 5% amortizable interior debt bonds.

By now, investors had lost interest in the project and because of the shortage of funds the company was only able to build a bridge over the Río Balsas. Operating losses increased and the time limits, which had been deferred already, were again passing. In consequence, the company was forced to sell out to the F. C. Central for the sum of U. S. $225,000, of which the buyer was to pay $100,000 in cash and the remaining $125,000 with 5,000 of its own ordinary shares; to this price was added the 1,101,000 pesos of liabilities of the selling concern. The only condition which the F. C. Central set was that the government would allow it to choose any route as selected by its engineers and to this the government immediately agreed, in December 1902.

The F. C. Central soon realized that the cost of continuing to Acapulco was prohibitive and sought the usual deferment of time limits with the pretext of the depreciation of silver. However the government was adamant and cancelled the concession on 5 August, 1905,
with the loss of the guarantee deposit of 30,000 pesos. Thus the line advanced no further than Río Balsas.

The F. C. Central, which finally renounced its right to build a line between Pachuca and Tampico under its own concession in 1898, was not the only party to show interest in this route. A concession for a line between these two points was granted on 5 June, 1880, to León Baldy who immediately transferred it to the American, Richard Honey. The main features of this concession were that the line was to pass through Real del Monte, Regla, Alcholoya, Apulco and Zacualtipán, the gauge was not stipulated, the subsidy was to be 8,000 pesos per km. for standard gauge, 6,000 pesos for 914 mm. gauge and 4,500 pesos for 750 mm. gauge, and, in all cases, the subsidy was to be paid in bonds at par with 6% interest.

The concessionaire decided upon standard gauge but was unable to comply with the time limits which gave the government a pretext to reduce the subsidy, first to 7,000 pesos and then, in 1899, to 6,500 pesos. The company proposed a route which would pass through Apulco with branches to Zacualtipán and to the Trini-
dad mine but by 1898 it had only built 20 kms. of track. Another 50 kms. were built in 1899, followed by 20 kms. in 1900, and by 1901, a total of 100 kms. had been completed, of which the Sandoval-Apulco section comprised 72 kms. and the Tepenasco-Trinidad section comprised 28 kms. The obstacle of the sierra mountains proved too much for the undertaking which, on 20 November 1901, obtained instead the authorization of the government to extend its line from Sandoval to Mexico City, the principal source and destination of its traffic. No subsidy was granted and a 5-year time limit was set for the new section.

However the company was unable to obtain the necessary capital and, in April 1902, it sold its property and rights to the F. C. Central. The latter concern built another 94 kms. in 1903 so that the track stretched from Lechería to Apulco, from Téllez to Pachuca and from Tepenasco to Honey. But the obstacle of the mountains proved too much and no more track was built during the Porfiriato. Following various deferments of the time limits, the concession was cancelled in 1910.
The rather grandiose title of F. C. de Coahuila al Pacífico in fact referred to the line between Saltillo and Torreón, the plan for which was first conceived by Alfred Lilliendhal, an American mining engineer who was general manager of the F. C. Coahuila y Zacatecas. Lilliendhal obtained a concession for the line in November 1898, the main conditions being that the line was to be standard gauge, a time limit of 7 years was set and no subsidy was granted, whilst, on the other hand, the high maximum rates of 8, 6 and 4 centavos per metric ton per km. were established for First, Second and Third Class freight respectively.

The concessionaire then organized the F. C. de Coahuila al Pacífico in New Jersey, U. S. A., with a capital of 1.5 million pesos and contracted large mortgage loans in the United States and in Coahuila with the firm of Madero Hermanos. Construction began in 1900 and the line was completed in 1903 with a total length of 321 kms. between Saltillo and Torreón and some small branches. However, the traffic was insufficient to pay even the interest on the mortgage
obligations and the company declared bankruptcy in 1903, the very year in which the line was inaugurated. The creditors intervened and proposed to sell the line by public auction. Since the railway, although of little value by itself, provided a strategic link between the systems of the F. C. Nacional and F. C. Central, the government stepped in to prevent a ruinous competition for the line between the two latter railways. The line was adjudicated to the F. C. Central on condition that it did not operate it directly but rented it to a new company formed jointly by the F. C. Central and F. C. Nacional.

The rolling stock of the F. C. Central in 1890 comprised 129 locomotives, 120 passenger coaches and 2,929 freight cars; the figures for 1891 are 146 locomotives, 127 coaches and 2,732 cars; for 1903, 317 locomotives, 208 coaches and 5,867 cars; and for 1904, 400 locomotives, 224 coaches and 7,885 cars. 10

Details of the F. C. Central's traffic receipts are given in Table III. They show a slow but steady increase in revenue although, considering the length of the system which, by 1904, was over 3,550 kms., they compare
unfavourably with those of the F. C. Mexicano. The general feeling of disappointment over the results of the F. C. Central is well expressed by Fred Wilbur Powell when he says:

The Mexican Central was Mexico's greatest railroad. It spread over the country from the Capital to the northern border and from the Pacific to the Gulf. There were few cities of importance which it did not touch. It was heavily capitalized, however, and it failed to develop traffic to the extent that its promoters had expected, and it eventually passed out of Boston control.\(^ {11} \)

(iii) Compañía Constructora Nacional Mexicana: Mexican National Construction Company and Ferrocarril Nacional Mexicano: Mexican National Railway

The Compañía Constructora Nacional Mexicana obtained its concession on 13 September, 1880, and then proceeded to constitute itself legally in Denver, Colorado, with a capital of 5,000,000 pesos.\(^ {12} \) Following this, it bought the line of the Texas-Mexican company from Laredo to the port of Corpus Christi, Texas, which enabled it to import supplies direct from Europe. Work began with great energy in October 1880 and by the end of that year, the line from Mexico City to Toluca and Cuautitlán, which had been bought by the Constructora, counted 84 kms., 23 more than at the time of its purchase.
Meanwhile, the Constructora proceeded to acquire the concessions of all potential competitors. In May and June 1881, the F. C. de Toluca y Cuautitlán transferred all its rights and obligations to the new concern; on 24 May, 1881, the F. C. de Matamoros a Monterrey transferred the concession which it had obtained from the state of Tamaulipas and in December 1881, the F. C. Zacatecano transferred all the rights granted to it by the state of Zacatecas and the federal government. The Constructora also obtained new concessions direct from the government: on 24 August, 1881, James Sullivan signed a contract for the construction of a line from Mier to Guerrero and on 29 November, 1881, he signed another contract for the building of a line between Teoloyucan, Huehuetoca and Irolo, both of which were subsequently cancelled on 18 February, 1885. Before this, the Constructora had lost a concession when work on the Morelia section was suddenly suspended in January 1882. A year later, a decree of 10 January, 1883, consolidated all the concessions hitherto obtained by the Constructora under the terms of the concession of 13 September, 1880, except with regard to the time
limits and the routes of the lines. On 2 June, 1883, the government authorized the consolidation of the concessions of 24 January, 1881, and 23 May, 1882, for the construction of a loop line around Mexico City (known as the F. C. de Circunvalación), with a branch to Tlalpan, under the terms of the Constructora's concession. These concessions had been transferred to the Constructora by the original concessionaire, Manuel Loera.

In the meantime, work on the line had begun and initially was carried on at a rapid rate. Construction was undertaken by the Constructora which handed over each section, as it was completed, to the Ferrocarril Nacional Mexicano, the operating company which was also constituted in Denver, Colorado, by the same interests. Construction work was carried on in several different sections at the same time, the first stretch to be completed being the section from Mexico City to Toluca, 73 kms. in length, which was opened on 4 May, 1882. This was followed by the Laredo-Lampazos section of 115 kms., finished on 12 May, 1882; a short stretch on the Colima line from Manzanillo to Tepalcate, 8 kms., finished on 5 September, 1882; the Lampazos-Monterrey part of the main
line, 153 kms., finished on 26 October, 1882, and the section from Manzanillo to Armería on the Colima line, 44 kms., completed on 18 November, 1882. Subsequently, the following sections were completed and opened to traffic: a section of 30 kms. from Zacatecas towards Ojo Caliente on 9 January, 1883; the section from Toluca to Maravatío, 153 kms., on 6 February, 1883; from Maravatío to Acámbaro, 58 kms., on 6 April, 1883; from Monterrey to Saltillo, 106 kms., on 5 September, 1883; from Morelia to Acámbaro, 87 kms., and from Acámbaro to Celaya, 80 kms., on 6 October, 1883; and from Celaya to San Miguel de Allende, 58 kms., on 3 December, 1883.

The Constructora then suspended work on the international and interoceanic lines because of its failure to receive the official subsidy on time and its inability to secure capital in the United States owing to a brief financial crisis there. However, work continued on the Matamoros-Monterrey line until April 1884. 19 kms. were built by January 1883; the line was completed from Matamoros to Reynosa, a distance of 86 kms., on 10 January, 1884, and reached San Miguel de las Cuevas, a total distance of 120 kms., on 23 April, 1884, at which time work
was suspended. Thus, by 1884, the Constructora had built 1,164 kms. of track, which was more than enough to fulfil the terms of its concession. However, this total length was spread over 7 unconnected sections and this, together with its narrow gauge, prevented the F. C. Nacional from competing effectively with the F. C. Central.

The suspension of building operations on the line to the U. S. border lasted until 1887, but some work was done in Michoacán and the section from Morelia to Lagunillas, 36 kms. in length, was inaugurated in November 1885; the line was completed as far as Pátzcuaro, a distance of 153 kms., on 1 June, 1886.

The lack of resources made the position of the undertaking untenable. Its line was divided into isolated sections which discouraged through traffic and made it impossible to increase its receipts whilst the failure to fulfil the terms of some of its concessions had led to the cancellation of those for the Teoloyucan-Irolo and Mier-Guerrero lines. The promoters, Palmer and Sullivan, therefore organized a new company in the United States which was controlled by the British bond-
holders of the original company and which also included the original American capital. The new company took the title of "Camino de Fierro Nacional Mexicano" and on 23 May, 1886, all the rights, obligations and property of the Constructora on all its railway and telegraph lines except the interoceanic line were turned over to Ekstein Norton, the representative of the new company, for the price of 9,732,000 pesos to be shared out amongst the holders of first mortgage bonds. The Constructora retained the isolated sections around Colima and Zacatecas with which to form an interoceanic line whilst the C. de F. Nacional, for its part, promised to spend 10.5 million pesos to complete the Mexico City-Laredo line. The government approved the transfer by a decree of July 1886 which modified the original concession very liberally. The main innovations were the authorization to construct another line from a point situated between Laredo and Monterrey to the coalfields of Nuevo León and Coahuila, for which a subsidy of 7,500 pesos per km. for 120 kms. was promised, authorization to widen its gauge, if it wished, and permission for an increase in freight rates to a
maximum of 6, 4 and 3 centavos per metric ton/km. of First, Second and Third class freight respectively.

Work now resumed on the remaining 565 kms., starting in a southbound direction from Saltillo in October 1887 and northwards from San Miguel Allende, and the entire line from Mexico City to Laredo, 1,351 kms. in length, was completed and inaugurated on 1 November, 1888. The C. de F. Nacional had the advantages of possessing the shortest route from Mexico City to the U.S. border, being 619 kms. shorter than the F. C. Central and 406 kms. shorter than the F. C. Central/F. C. Internacional combined route, and of owning the easternmost terminal, which was thus nearer to the industrial regions of the United States, but, on the other hand, its narrow gauge proved to be a disadvantage since it made trans-shipment necessary in Laredo or Corpus Christi, and often in Mexico as well.

The Constructora undertook some work on the Manzanillo-Colima and Zacatecas-Ojo Caliente sections, which it had retained, building 3 kms. of track in 1888, 62 kms. in 1889 and 1 km. in 1890, to give a total of 94 and 48 kms. respectively on these two sections. No
more construction work was done and following repeated agreements with the government in 1888, 1892, 1893 and 1895 regarding exemptions from customs duties and the deferment of time limits, the company lost the right to build the interoceanic line in 1897.

After the completion of its main line, the C. de F. Nacional undertook no more construction for 10 years, allowing the concessions for the sections of the Mexico City loop line and the Matamoros-Monterrey line as yet unbuilt and for the whole of the line to the Coahuila coalfields to be cancelled by the government. Then, in June 1896, it obtained authorization to construct a line between Pátzcuaro and Uruapan under the terms of its own concession. Work began in 1898 and by the end of the year 30 kms. had been constructed, taking the track as far as Jujucata.

By the mid-1890's, however, the C. de F. Nacional was in a poor position in comparison with its chief rival, the F. C. Central. The trans-shipments made necessary by the narrow gauge caused losses in time and money whilst the round-about route via Toluca and Acámbaro made the line longer than necessary and burdened it with
some steep gradients. The position was becoming criti-
cal and so the company decided to undertake the work
necessary to increase its local and through traffic,
including changing the track to standard gauge and short-
ening the route. Both these operations would involve
the undertaking in heavy capital expenditure and so, in
1897, it began to negotiate with the holders of the A and
B 6% mortgage bonds in order to obtain their consent for
a new issue of bonds to pay for the necessary improve-
ments. Agreement was finally reached in 1901 and, on 29
February, 1902, a new concern called "The National Rail-
way Co. of Mexico" was formed in Utah to take charge of
the properties of the C. de F. Nacional and to carry out
the desired changes.

The "Ferrocarril Nacional de México", as the new
company was called in Spanish, was authorized to issue
U. S. $20,000,000 in 4½% Priority gold bonds, $15,000,000
in 4% Consolidated mortgage bonds, $25,000,000 in 4% non-
accumulative Preference shares and $33,350,000 in Ordin-
ary shares, giving a total of $93,350,000. The securities
of the new company were to be exchanged for those of the
old one as follows: for each old First Mortgage bond of
$1,000, another 4.5% bond of equal value and priority in the new company plus $35 in cash; for each old Second Mortgage A bond, $937.50 in 4% Consolidated mortgage bonds plus $21.88 in cash; for each old Second Mortgage B bond, $900 in old Ordinary shares and a new bond of equal value. The new company also issued $9,221,000 in 4.5% Priority bonds and $3,595,312.50 in 4% Consolidated First Mortgage bonds which were sold by the banking houses of Speyer & Co. and Kuhn, Loeb Co. in New York and Speyer Brothers of London, which were in charge of the reorganization of the undertaking.

The arrangement was approved by the government in the concession of 24 April, 1902, which authorized the transfer of the rights and property of the old C. de F. Nacional to the F. C. Nacional. With the proceeds from the sale of the bonds and shares detailed above, the company changed the gauge of the main line between Empalme González (where the new direct line would join the original line) and Laredo and of the part of the Matamoros branch which had already been completed, beginning the task of conversion in 1901 and completing it in 1903. It also resumed construction on the Mata-
moros line, began work on the direct line from Empalme González to Mexico City which, when completed, shortened the distance to the U. S. border by 60 kms., and purchased rolling stock for the standard gauge lines. When the cost of these improvements had been covered, the company still had enough capital left over from its financial reorganization to buy U. S. $15,786,100 in Ordinary shares of the F. C. Internacional (out of a total of $20,708,200) and all the fixed income bonds of the same line, which amounted to $4,499,000, thus acquiring absolute control of this railway.

At the same time, April 1902, the F. C. Nacional obtained the concession for the railway from Guanajuato to Dolores Hidalgo and San Luis de la Paz, including its line of 60 kms. between Rincón and San Luis de la Paz, and also the Salamanca-Jaral line, 35 kms. long, and the Vanegas-Matehuala line, 65 kms. long. Already, in 1900, the C. de F. Nacional had leased the F. C. Michoacán y Pacífico whose line, extending from Moreovatio to Acampo with a branch to Anguagueo, had been built by the Michoacan Railway & Mining Co. in the early 1890's. In 1906, the F. C. Nacional absorbed the F. C.
Hidalgo y Nordeste whose line extended from Mexico City to Tortugas with branches to Pachuca and Irolo, giving a total length of approximately 250 kms.

Meanwhile, in 1905, the F. C. Central purchased a controlling interest in the Constructora company in order to incorporate the latter's Manzanillo-Colima line in its own extension to the Pacific coast.  

The rolling stock of the F. C. Nacional numbered in 1890, 105 locomotives, 151 passenger coaches and 2,556 freight cars; in 1903, 179 locomotives, 135 coaches and 3,692 cars of both standard and narrow gauge; and in 1904, 245 locomotives, 301 coaches and 4,062 cars.  

The improvements and acquisitions made by the F. C. Nacional in the first years of the 20th century turned it into the principal railway undertaking in Mexico. Its financial position was strong, in contrast to the tottering F. C. Central; it already possessed the shortest route to the U. S. border and now this line had the added advantage of being standard gauge; its track and rolling stock was new, again in contrast to the antiquated equipment of the F. C. Central; by its acquisition of the F. C. Internacional it had established con-
control of the three easternmost outlets to the United States, Piedras Negras, Laredo and Matamoros, and deprived the F. C. Central of access to Piedras Negras and Tampico (the latter concern was forced to build a new line from San Pedro de las Colonias to Paredón and purchase the F. C. de Coahuila y Pacífico in order to regain access to Monterrey and Tampico). All the F. C. Nacional needed for its cup truly to run over was access to a Gulf coast port nearer the centre of the country (Tampico or Veracruz) and it was the company's efforts to gain this access which eventually brought about its undoing.

(iv) Ferrocarril Internacional Mexicano: Mexican International Railroad

The third important railway to link Mexico with the United States was the Ferrocarril Internacional Mexicano. This was promoted by General John Frisbie, representing Collis P. Huntington and the Southern Pacific interests, who tried unsuccessfully to obtain a concession under the first Díaz regime. He repeated his request in 1881, after President Manuel González had taken over from Díaz, but the Minister of Fomento
was reluctant to assume the additional burden of subsidizing a third great trunk line from the public treasury. Frisbie therefore sought, and this time obtained, a concession without provision for any subsidy for the construction of a railway from Mexico City via Guanajuato, Zacatecas and Durango to some point on the U. S. border between Piedras Negras and Laredo with two branches, one to a point on the Gulf coast between the ports of Matamoros and Tampico and the other to the Pacific coast between Mazatlán and Guaymas.16

This concession was granted to the Compañía Constructora Internacional on 7 June, 1881, and represented the most important contract relating to railways to be made during the presidency of Manuel González. It stipulated that construction was to begin within 6 months of the date of issue of the concession, that the line was to be completed within 10 years and that the company was to construct minimum lengths of 50 kms. in the second year, 100 kms. in the third year, 160 kms. in the fourth year, etc. Further decrees issued in late 1881 and on 21 April, 1882, clarified and modified certain articles and added powers to construct branches, increased
time limits and established a customs house at the point where the line reached the U. S. border.

After obtaining the concession, Frisbie transferred it to Huntington, who was acting for the construction company which had been organized in Connecticut in March 1881. This company was reorganized as the International Railroad Co. (in Spanish, "Ferrocarril Internacional Mexicano") on 26 April, 1882, on which date it obtained a charter from the Connecticut legislature.

Construction began with the building of an international bridge over the Rio Bravo at Piedras Negras in November 1882. However the work did not really gather momentum until the completion of the Galveston, Houston & San Antonio Railroad's line to Eagle Pass, opposite Piedras Negras, in 1883. By May 1883, the first section of 76 kms. was finished and in July 1883, the next stretch of 41 kms. as far as Sabinas was completed. The track was laid as far as Monclova by January 1884 and the stretch from Sabinas to Castaño, south of Monclova, 141 kms. long, was completed in March 1884, giving the line a total length of 258 kms. by that date. The 16-km. branch from Sabinas to Rosita and San Felipe, used ex-
clusively for coal traffic, was completed in September 1884. Construction was suspended during 1885 and 1886 owing to the financial crisis in the United States but work was resumed energetically in 1887 and on 1 March, 1888, the line reached Torreón where it made junction with the main line of the F. C. Central. The F. C. Internacional then had a trunk line of 617 kms. and was able to provide a through service from Mexico City to New Orleans, New York and Philadelphia, using the lines of the F. C. Central, its own track and the Southern Pacific Railway; this was publicized as the "Sunset Route".

The F. C. Internacional then sought and obtained, on 22 August, 1888, a postponement of the time limit for the completion of its line to Mexico City and permission to have joint lines with other companies and to transfer and lease its lines. In consequence, it became mainly a link line between the F. C. Central, F. C. Nacional and F. C. Monterrey al Golfo. The only construction undertaken between 1888 and 1892 was the branch between Hornos and San Pedro de las Colonias, built in 1890, with a length of 24 kms., but in 1892, building
was again begun with great energy and the line was extended another 250 kms. from Torreón to Durango by 1 October, 1892. This gave the F. C. Internacional a main line of 870 kms. running from Ciudad Porfirio Díaz (the new name for Piedras Negras) to Durango.

After the completion of the line to Durango in 1892, the company ceased construction work on its main line and from then on built only branch lines and feeders. A small branch, 9 kms. long, was built between Pedriceña and Velardeña in 1892, followed by a line 68 kms. long from Monclova to Cuatro Ciéñegas in 1895, and a 70-km. branch built between Matamoros and Zaragoza in 1896 to serve the local cotton plantations. On 30 March, 1896, the company obtained permission to build branches of more than 160 kms. and the guarantee that no subsidy would be given to any other railway established within 40 kms. on either side of its route; it was also given a new and exceptionally high rate structure. In 1898, the company built a branch between Reata and Monterrey, 116 kms. in length, which paralleled the Treviño-Monterrey line of the F. C. Monterrey al Golfo. Subsequently, in 1902, a line was built from Durango to Tepehuanes, a distance of
217 kms., and another, 24 kms. long, was laid from Horizonte to Bermejillo. However, after the acquisition of the F. C. Internacional by the F. C. Nacional, only another 40 kms., consisting of the Mezquite, Purísima and Minas de San Pedro branches, were built, giving the system a total length of 1,456 kms. in 1910.

The rolling stock of the F. C. Internacional consisted of 33 locomotives, 22 passenger coaches and 1,721 freight cars in 1890 and had increased to 73 locomotives, 35 coaches and 2,195 cars by 1903, and to 78 locomotives, 35 coaches and 2,256 cars by 1904.17

Details of the results of operation of the F. C. Internacional are given in Table V. The railway's traffic was primarily freight and consisted largely of iron-ore from the large deposits around Durango, coal from the coal fields of Coahuila, and the industrial output of Monterrey.

Control of the F. C. Internacional passed to the F. C. Nacional in 1901-02 when the latter company bought $15,786,100 of its Ordinary shares, out of a total of $20,708,200, and all its fixed income bonds. Then, in 1909-10, the Southern Pacific transferred a large block
of shares of the company to the newly-formed Ferrocarriles Nacionales de México and the F. C. Internacional passed out of existence.
Notes


3. See David M. Pletcher: "Rails, Mines, and Progress" (New York, 1958), Chapters II and III.

4. Fred W. Powell: "The Railroads of Mexico" (Boston, 1921), pp. 120-21.

5. Pletcher, op. cit., p. 3.


7. This subsection is based on Cosío Villegas, op. cit., VII, pp. 503-17.

8. Details of the F. C. de Sonora's concession were not given for the sake of comparison.


10. Secretaría de Comunicaciones y Obras Públicas: "Album de los ferrocarriles, año de 1891" (México, D. F., 1892); "Reseña sobre los principales ferrocarriles" (Mexico, D. F., 1892); "Reseña histórica y estadística de los ferrocarriles" (México, D. F., 1905); Mariano Téllez Pizarro: "Apuntes históricos sobre los ferrocarriles de la República Mexicana" (México, D. F., 1904).


12. Material for this subsection has been drawn from Cosío Villegas, op. cit., VII, pp. 520-23, 547-49, 602-05; and from Powell, op. cit., pp. 133-35.
13. Powell, op. cit., p. 130.


III. COMPETITION AND COOPERATION -- F. C. INTEROCEANICO

(i) Ferrocarril Interoceánico de Acapulco, Morelos, México, Irolo y Veracruz: Acapulco, Morelos, Mexico City, Irolo and Veracruz Interoceanic Railway

The formation and construction of the F. C. Interoceánico was stimulated by a desire to end the monopolist position of the F. C. Mexicano on the Mexico City-Veracruz route where high rates and indifferent service had been a constant source of complaint since the opening of the line in 1873. The line was not built as a single entity but formed piecemeal from a variety of concessions and existing sections of track. It never achieved the objective suggested in its grandiose title of forming a route between the Pacific and Atlantic Oceans but, on the other hand, it did achieve its more immediate purpose of constructing a competing line to the F. C. Mexicano between Mexico City and Veracruz. This ran via Irolo, San Martín, Puebla, Perote and Jalapa and was opened throughout in 1892. It was narrow gauge and considerably longer than the F. C. Mexicano. If only for these reasons, the railway was not an outstanding success, and in 1905 it was acquired by the F. C. Nacional as part of an arrangement which gave the government, already the majority
shareholder in the F. C. Interoceánico, control of the F. C. Nacional. After 1908, the F. C. Interoceánico was operated as an adjunct of the "Ferrocarriles Nacionales de México", but it retained its formal independence until much later when it was finally absorbed by the latter concern. Its gauge was change to standard in the mid-1940's.

The beginnings of the F. C. Interoceánico are well summarized in the words of Fred Powell, Ph.D.:

The early history of the Interoceanic project is a narrative of petty concessions and of the construction of petty lines; of small corporations, which, failing in their purpose, consolidated with others of like nature which failed in turn.¹

The earliest concession was that of 16 April, 1876, granted to the state of Morelos for a railway from Mexico City to Morelos and Cuernavaca and from one of these points to the Rio Amacusac.² On 5 October, 1878, this concession was transferred to the Mexico & Morelos railway company, headed by Manuel Mendoza Cortina, which began construction and reached Cuautla, a distance of 138 kms., in July 1881.

On 8 July, 1880, a concession was granted by the federal government to the state of Guerrero for a line
from Mexico City to Acapulco via Chilpancingo and Iguala; this concession was transferred to Delfín Sánchez Juárez, a shareholder in the Morelos railway, on 12 February, 1881. Some surveying was done but work was then suspended; a decree of April 1882 set new time limits but deprived the company of all rewards, restricted its powers and obliged it to give the government one thousand iron telegraph poles.

A concession was granted by the federal government to the state of Morelos on 27 November, 1880, for the construction of a railway from Los Reyes, on the Morelos line, to Irolo on the F. C. Mexicano line. This concession was also acquired by Delfín Sánchez, on 11 December, 1880. Work began immediately at Los Reyes; 5 kms. were completed by April 1881; 22 kms., stretching as far as Texcoco were finished by November 1881; 30 kms., as far as Tepetlaxtoc by March 1882; and the entire line from Los Reyes to Irolo, 81 kms. in length, was completed on 31 December, 1882. On 23 December, 1881, the company had sought and obtained from the government a concession to extend the line from Irolo to Mexico City via Peñón; a time limit of 20 months was fixed but the company man-
aged to complete the entire line of 21 kms. by May 1882.

On 21 January, 1882, a concession was granted to Francisco Arteaga for a line from Irolo to Puebla, Izucar de Matamoros, Chietla and a point on the Morelos railway, thus making a circle with the previously mentioned line. The main conditions of the concession were that the line was to be completed as far as Puebla in 3 years and throughout within another 3 years; a subsidy of only 6,000 pesos per km. with no right to any premium was granted whilst the company guaranteed the fulfilment of its obligations with a deposit of 5,000 pesos, which it duly delivered. Delfín Sánchez purchased this potentially competitive concession on 21 February, 1882; work began from Irolo and by the end of 1882, 15 kms. of track had been laid to a point beyond San Lorenzo.

Delfín Sánchez realized that the Morelos and Guerrero lines would run almost parallel in places and so he obtained two new concessions. The concession of 10 October, 1882, replaced the Rio Amacusac branch of the Morelos railway with a line from Cuernavaca to Toluca or
the most convenient point to make a junction with the system of the Compañía Constructora Nacional Mexicana (later the F. C. Nacional). The concession of 19 October, 1882, merged the Morelos company, the México-Acapulco company and the México, Irolo, Puebla & Izucar de Matamoros company into one single concern entitled the "Ferrocarriles Unidos de Morelos, Irolo y Acapulco".

Meanwhile, on 6 September, 1880, a concession had been granted by the federal government to the states of Puebla and Veracruz for a railway from Jalapa to San Andrés Chalchicomula on the F. C. Mexicano main line. This concession was transferred to Ramón Zangronis, to whom was also granted another concession for a line from Jalapa to Veracruz, to be completed within 3 years. Then, on 27 June, 1881, a concession was granted to Francisco M. Prida, representing the same interests, for a line from San Andrés Chalchicomula to a junction with the Morelos railway at Texcoco or Ayotla. This concession stipulated that the line was to be finished within 6 years, that the subsidy was to be 6,000 pesos per km., that there was to be no premium and that a guarantee of 10,000 pesos must be delivered. On 21
November, 1881, the three concessions were consolidated and the "F. C. Nacional Interoceánico" was organized by Zangronis and Prida.

Finally the "Ferrocarriles Unidos de Morelos, Irolo y Acapulco" and the "F. C. Nacional Interoceánico" were merged on 13 February, 1883, by a contract signed between the Minister of Fomento and Francisco Arteaga, the representative of the company, to form the "F. C. Interoceánico de Acapulco, Morelos, México, Irolo y Veracruz". This contract stipulated that the line would not now run from Perote to San Andrés Chalchicomula to connect in Ayotla with the Morelos railway but instead would run from Perote to San Lorenzo on the Irolo line. The undertaking also renounced the extension to Texcoco and the Perote-Teziutlán branch and, in compensation, was permitted a subsidy of 8,000 pesos per km., instead of the earlier 6,000, on the Perote-San Lorenzo section.

Construction soon got under way. A line, 20 kms. in length, was built from Cuautla to Yautepec; 3 kms. were added to the line from San Lorenzo to Puebla and Izucar; and two sections of the Veracruz line were built, from San Lorenzo to La Luz, 22 kms. in length, and from
Veracruz to Jalapa, 25 kms., so that, by December 1884, the total length of the F. C. Interoceánico system was 325 kms. However during 1885 and 1886 the undertaking constructed only a few kilometres, sufficient to bring its main line to Mazapa, in the direction of Puebla.

In the meantime, Delfín Sánchez made a financial arrangement with the Compañía Carbonífera which controlled the railways from Puebla to San Marcos and San Juan de los Llanos, which had been built under a concession granted by the federal government to the state of Puebla on 14 September, 1880, and transferred to Luis García Feruel and Jacobo Ortiz Borballa on 30 September, 1880, and to San Martín Texmelucán. Immediately, on 3 July, 1886, Delfín Sánchez obtained the consolidation of the concessions of these railways with that of the F. C. Interoceánico so that the Carbonífera, without knowing how, suddenly found itself without any rights over its lines. It protested weakly but could only obtain the suspension of the decree. A few months later, on 17 November, 1886, the Carbonífera was obliged to sell out for 2,335,000 pesos, payable in Ordinary shares of the F. C. Interoceánico, of which 1,500,000 were given to the
shareholders of the Carbonífera and the rest to the former San Martín railway which had reserved this right in case of the company being dissolved. In exchange, the F. C. Interoceánico absorbed 624,503 pesos of the floating debt of the Carbonífera.

In 1887, Delfín Sánchez assured the punctual payment of the subsidy of 8,000 pesos per km. in certificates of the Secretaría de Hacienda with a charge on the tax-collecting offices. The government resolved that the 4-km. branch between San Lazaro station and La Aduana formed part of the system and that the line between Peralvillo and Los Reyes could be lifted. In another agreement the concessionaire engaged himself to convert the San Martín line to narrow gauge and to improve its specifications.

Delfín Sánchez now controlled one continuous line from Yautepec to Mazapa, another from Puebla to Varela, and a small section from the port of Veracruz which, together, had a total length of 500 kms. On 4 November, 1887, the government assigned all the relevant concessions to the F. C. Interoceánico and paid off the other contractors.

The F. C. Interoceánico was now near completion and
so, with the encouragement of two of his partners, President Díaz and Manuel Dublán, the Minister of Hacienda, Delfín Sánchez went to London in 1888 to raise the capital necessary to finish the line. In London he emphasized the fact that the F. C. Interoceánico route had fewer steep gradients than that of the F. C. Mexicano, thus permitting longer trains giving lower rates but larger profits than on the older line, and soon interested a group of British capitalists in the project. On 20 April, 1888, the concession held by Sánchez was transferred to the "Interoceanic Railroad Ltd.", organized by Christian Murielta & Co. of London, the contract of sale being signed on 5 May, 1888. Sánchez, President Díaz, his father-in-law, Romero Rubio, and ex-President Manuel González obtained a large block of shares in the new company and over 300 British investors soon subscribed £800,000 in £10 Preferred shares offered by the Interoceanic company in June and July, 1888.

At this time, Frederick Issacson, a Member of the British Parliament and a shareholder in the Mexican Railway Co., protested to the Foreign Office in London that the concession granted to the F. C. Interoceánico violated
that granted to the F. C. Mexicano. The Foreign Office, however, dismissed the protest and refused to intervene.

Having obtained capital, the company now resumed construction. The Mexico City to Puebla section was modernized in late 1888 under the direction of a British engineer who had formerly been working in Brazil; 10 locomotives and 125 cars were ordered from the United States and a "Businessman's Special" was put into service. The Puebla-Perote section was assigned to Scott, Read, Campbell & Co. of London in September 1888 and was completed a year later. In all, 74 kms. were built in 1889, 144 kms. in 1890, and the remainder of the line to Veracruz was finished by Sullivan & Hampson Contractors Co. in April 1891.

Meanwhile the company had found that the first 25 kms. out of Veracruz were poorly located and managed to persuade the government to give a subsidy of 6,000 pesos per km. for a new line, to be built to replace the original one, and to keep 2,000 pesos as a deposit to be given to the company if it completed the line before 5 May, 1891. Thus the subsidy given to the F. C. Inter-
oceánico was composed of 8,000 pesos per km. for 359.112 kms., 6,500 pesos per km. for 81 kms. and 6,000 pesos per km. for 40 kms., all paid in cash, with the remaining 8,000 pesos being paid in certificates redeemable with 3% of the duties collected in the maritime and frontier customs. Furthermore as the main line was completed before the deadline, the company received the premium of 2,000 pesos.

The main line of the F. C. Interoceánico from Mexico City to Veracruz was thus completed in April 1891. It was built to the narrow gauge of 914 mm. (3 ft.) and had a total length of 547 kms., 123 kms. longer than the route of the F. C. Mexicano. Following completion of the new sections of track, the older parts were renovated and the whole line was formally inaugurated in December 1892.

This completed the main system of the F. C. Interoceánico although the company continued to construct lines which acted as branches and feeders. A line was built from Los Reyes to Jojutla, a distance of 179 kms., in 1892 and extended another 19 kms. to Puente de Ixtla between 1892 and 1894. The line from Puebla to Izucar...
de Matamoros, 84 kms. in length, was bought in London for £200,000, payable in Ordinary shares of the F. C. Interoceánico, on 27 July 1891; the president of the F. C. Interoceánico then stated that this purchase meant that the company had decided to extend the Izucar line, instead of the Amacusac line, to the Pacific. The length of the line was reduced from 84 to 76 kms. because the stretch from Puebla to Los Arcos, parallel to the F. C. Interoceánico, was lifted. In 1889 the company had obtained a concession for a railway from Izucar to Acapulco and, in early 1890, another for a line from a point on the F. C. Interoceánico between Ayotla and La Compañía to another point on the same railway between Texmelucan and Puebla. Both concessions were consolidated into one and the time limits extended on 22 April, 1891. Another decree was issued on 12 June, 1893, which again extended the time limits and promised a subsidy of 8% p.a. on 30,000 pesos per km., which subsidy was to be paid 2 years after the completion of each 20-km. stretch. The first of these stretches was completed in 1892 and the second, from Izucar to Tlancualpícan, in 1894. In May 1895 the subsidy was converted into bonds of the in-
terior debt and on 30 December, 1895, the part not yet constructed was transferred to the concession of the "F. C. de México a Cuernavaca y el Pacífico". Besides these later additions, the F. C. Interoceánico system also included parts of the original line which had been converted into branches by the building of the main line to Veracruz, namely the sections from Virreyes to Libres, 11 kms. in length, from San Lorenzo to San Nicolás, 24 kms., and from San Lazaro to La Aduana, 4 kms.

In 1902 the F. C. Interoceánico acquired the San Marcos & Nautla railway which ran from San Marcos to Tezuitlán, organizing a subsidiary company, the F. C. Oriental Mexicano, to take over control, and in 1903 the Matamoros and Morelos branches were joined by a line extending from Atencingo to Cuautla.

The rolling stock of the company in 1890, before the line was completed, consisted of 57 locomotives, 47 passenger coaches and 641 freight cars. In 1903, the figures were 77 locomotives, 84 coaches and 1,313 freight cars and in 1904, 78 locomotives, 83 coaches and 1,309 freight cars.³

³ The F. C. Interoceánico was not a huge success al-
though, ironically, it did achieve the purpose for which it was conceived, that of forcing the F. C. Mexicano to reduce its rates. However, as so often happened in the history of Mexican railways, the traffic potential was limited and the demand was not sufficiently elastic to respond fully to the increase in supply so that whereas one company was profitable, two were a crowd. Nevertheless the F. C. Interoceánico did manage to build up a respectable traffic and by 1900 its total receipts had almost equalled those of the long-established F. C. Mexicano. But the line suffered from its narrow gauge and its excessive length which increased its operating costs and reduced its profit margin. If we compare the coefficient of operation (i.e., the ratio of operating costs to receipts) of the F. C. Mexicano and the F. C. Interoceánico, which for the years 1900-02 and 1908 were, respectively, 0.570, 0.629, 0.6203 and 0.610 for the F. C. Mexicano, and 0.748, 0.776, 0.870 and 0.650 for the F. C. Interoceánico, the disadvantage of the F. C. Interoceánico becomes clear, although it will be noted that the long term tendency was in favour of the latter railway. This is reflected in the dividend record of the
F. C. Interoceánico which, until the later 1900's was an unbroken line of "nils" (see Table VI). Certainly contemporary Mexicans were not over-impressed with the new route to Veracruz. Mariano Téllez Pizarro's word on the line is: "This railway has distinguished itself by its bad service and frequent accidents." Hardly an inspiring epitaph.

(ii) Competition and Cooperation: Problems, Problems, Problems

The opening of the F. C. Interoceánico in 1892 was indicative of a major change in the Mexican railway situation. Hitherto, Mexico had been chronically short of railways. Now it began to appear that some parts of the country, at least, were becoming oversupplied with lines, with a correspondingly adverse effect on the traffic and receipts of the undertakings concerned. The situation was made all the more critical by the fact that all four of the principal trunk lines, the F. C. Mexicano, F. C. Interoceánico, F. C. Central and F. C. Nacional, were in a position to compete for the most lucrative traffic, through merchandise between Mexico City and Europe and the United States.
Two alternatives offered themselves to the railway companies: they could each strive for supremacy, hoping to force their rivals to terms, and even to surrender, by means of improved services, expanded trackage and drastic rate cuts, or else they could sit tight and cooperate in the hope that the natural growth of the Mexican economy would eventually supply enough traffic to satisfy all of them. The competitive, expansionist solution was generally preferred by the northern lines but it brought meagre results, largely owing to the shaky financial position of its chief proponent, the F. C. Central, and both these companies were forced to come to some sort of terms with the two Veracruz lines which, particularly in the case of the solidly-founded F. C. Mexicano, preferred to take a more philosophical attitude towards the question of traffic returns. Thus ruinous competition and rate wars gave way to an uneasy cooperation expressed in receipt pooling arrangements.

The inauguration of the F. C. Interoceánico in 1892 coincided with a fierce rate war instigated by the F. C. Central. This railway already carried a large proportion of the traffic to and from the United States but it also
wished to have a share in the European traffic. Consequently in June 1892, the F. C. Central cut its rates for handling freight from Tampico or El Paso to Mexico City to an average of a quarter of the rates charged by the F. C. Mexicano for carrying freight to the same destination. This was intended as a short-term manoeuvre to attract shippers and manufacturers to the F. C. Central but the F. C. Mexicano, F. C. Interoceánico and F. C. Nacional replied in kind and within 2 months, rates were being adjusted every day. The F. C. Central made bigger losses than expected owing to a poor harvest in eastern Mexico and a drop in the price of silver and so it attended a meeting with the three other railways in London in August 1892 to work out a compromise agreement. In London uniform charges were agreed upon for the carriage of freight of European origin destined for competitive points in Mexico and an arrangement for the pooling of receipts was made.

The terms of this arrangement stipulated that the gross receipts were to be pooled and a fixed percentage was to be allocated to each company. 8 pesos on each ton carried were to go to the railway doing the actual hauling;
of the remaining receipts, 45% was to go to the F. C. Mexicano, 20% to the F. C. Interoceánico, 22% to the F. C. Central and 12% to the F. C. Nacional. No arrangements were made to pool receipts from traffic entering Mexico from the United States but it was agreed that shipments to Mexico City and its environs from Veracruz, Tampico or the northern termini of the F. C. Central and F. C. Nacional were all to be hauled at the same rate, depending on the class of goods involved. The F. C. Mexicano and F. C. Interoceánico also agreed together to set fixed rates on all Mexican goods carried to competitive points. President Díaz disapproved in private of the agreements but he allowed them to go into immediate effect.

The arrangements involving all four companies lasted until June 1895. By then, it was evident that the northern lines carried only about 10% of the European traffic that landed in Mexico and yet they received over 30% of the gross receipts from that traffic. The F. C. Mexicano and F. C. Interoceánico complained that their rivals constantly broke the agreement for hauling traffic from the United States to Mexico City and so when the
two Veracruz lines suggested an adjustment of the European pool and the institution of a pool for American traffic, the F. C. Central withdrew from all agreements with other railways. This occurred in June 1895 and in the following September, the F. C. Mexicano and F. C. Interoceánico, which, besides serving the same principal cities, were also both British-owned, set up their own temporary pool of receipts earned from carrying freight of American and European origin from Veracruz to Mexico City.

When the F. C. Central withdrew from the pooling agreement in June 1895, it renewed the rate war and made a number of agreements with European shippers to carry their goods from Tampico to Mexico City for 6 months at an average rate of 5 to 8 pesos per ton, 25 pesos per ton less than the rate charged under the terms of the pooling agreements of 1892. The F. C. Mexicano and F. C. Interoceánico retaliated with average charges of 9 pesos from Veracruz to Mexico City. A year later, the F. C. Central directors suggested a return to the pooling system and the stabilization of rates at a reasonable level. A revised arrangement for pooling receipts from European
traffic and maintaining similar rates on merchandise entering Mexico from the United States was signed in October 1896.

The agreement relating to European traffic was renewed in 1899 and again in 1902, but the new European pool increased the percentage of annual gross receipts going to the F. C. Mexicano and F. C. Interoceánico from 69% to 79.4% and proportionately reduced the share allotted to the northern lines. The agreement regarding American traffic was renewed in 1899 but cancelled by the F. C. Central and F. C. Nacional in 1902. The F. C. Mexicano and F. C. Interoceánico continued to charge uniform rates for domestic traffic carried to competitive points and similar arrangements were made in 1902 for American traffic coming into Veracruz. The agreement for pooling traffic and traffic receipts made in 1902 was halted in 1903, resumed in 1905 and still used with slight modifications by all four railways serving Mexico City in 1910.

Besides competition from the Veracruz lines, the northern railways also had to contend with rival shipping lines. The Ward Line, in particular, was a serious
competitor, charging rates for U.S.-Mexican traffic which the railways were unable to meet because of their long overland haul.

However, one of the most serious problems, which affected all the foreign-owned railways (i.e., the great majority) indiscriminately, was the effect of the depreciation of silver and the falling silver exchange rate. The price of silver dropped from 50 pence in 1884 to 33 pence in 1892 and to 19/20 pence in 1903. This depreciation, and its consequent effect on the exchange rates for silver-based currencies, directly affected the railway companies because, whilst their receipts were in silver-based Mexican pesos, being foreign-owned they had to pay dividends on shares and interest on bonds in pounds sterling and gold dollars. Their profits in pesos had to be converted at the current exchange rates and, consequently, their profits in pounds and dollars were diminished by the falling price of silver. Besides dividends and interest, the foreign-owned companies also had to pay their staff and the expenses of their offices abroad in pounds and dollars and since nearly all railway equipment and supplies had to be imported, these
also had to be paid for in these currencies.

The effect of the depreciation of silver on the railway companies was really drastic as is shown by the losses incurred between 1892 and 1902 by the F. C. Central on this account.

Figures relating to the F. C. Central showing losses occasioned by the depreciation of silver:

<table>
<thead>
<tr>
<th>Year</th>
<th>In Mex. money (pesos)</th>
<th>In U.S. money converted at current exchange rate</th>
<th>Net profit in U.S. money if exchange rate had remained at 1892 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1892</td>
<td>2,961,467</td>
<td>U.S.$2,021,515</td>
<td>U.S.$2,021,515</td>
</tr>
<tr>
<td>1893</td>
<td>2,845,587</td>
<td>1,764,823</td>
<td>2,003,934</td>
</tr>
<tr>
<td>1894</td>
<td>2,966,350</td>
<td>1,538,693</td>
<td>2,088,978</td>
</tr>
<tr>
<td>1895</td>
<td>3,896,475</td>
<td>2,063,157</td>
<td>2,743,996</td>
</tr>
<tr>
<td>1896</td>
<td>3,463,747</td>
<td>1,841,516</td>
<td>2,439,258</td>
</tr>
<tr>
<td>1897</td>
<td>4,016,349</td>
<td>1,937,483</td>
<td>2,828,414</td>
</tr>
<tr>
<td>1898</td>
<td>4,427,534</td>
<td>2,062,805</td>
<td>3,117,901</td>
</tr>
<tr>
<td>1899</td>
<td>5,199,095</td>
<td>2,516,961</td>
<td>3,661,334</td>
</tr>
<tr>
<td>1900</td>
<td>5,373,684</td>
<td>2,628,577</td>
<td>3,784,284</td>
</tr>
<tr>
<td>1901</td>
<td>4,986,663</td>
<td>2,384,598</td>
<td>3,511,734</td>
</tr>
<tr>
<td>1902</td>
<td>5,961,606</td>
<td>2,513,384</td>
<td>4,198,314</td>
</tr>
<tr>
<td></td>
<td>46,098,557</td>
<td>23,273,712</td>
<td>32,399,742</td>
</tr>
</tbody>
</table>

The falling value of silver thus caused a loss of $9,126,030 to the F. C. Central between 1892 and 1902. It was consequently a frequent source of complaint amongst the railway companies as well as an excuse for a variety of shortcomings and evasions. However, this problem was resolved in 1905 when Mexico went onto the
gold standard, fixing the price of the peso at 24.2 pence.

Nevertheless, other problems remained and these were largely the result of the railways' own deficiencies. Basically, in far too many cases, traffic receipts were simply not sufficient to cover the operating costs and the financial obligations already incurred, let alone pay for extensions and improvements. The capital and financial situation of the main companies will be discussed in the chapter dealing with the formation of the Ferrocarriles Nacionales de México. Operating costs depended upon a number of variables, such as the price of fuel, labour, supplies, etc., but a fundamental factor in determining them was the length of the lines involved. In many cases, the traffic simply could not support the length of lines necessary to carry it, especially in the north where the railways had to cross vast desert regions to reach the main centres of population and the U. S. border. These difficulties were determined by geography but the companies made the situation worse by building competitive parallel lines, e.g. in the area around Torreón, Saltillo and Monterrey.
A fairly clear idea of the relative strength of the various railways may be obtained by comparing their returns for the years 1892-1902 as expressed in profit per mile (in pesos):\(^8\)

<table>
<thead>
<tr>
<th>Years</th>
<th>F.C. Mexicano</th>
<th>F.C. Interoceánico</th>
<th>F.C. Central</th>
<th>F.C. Nacional</th>
<th>F.C. Internacional</th>
<th>Value of Mex.peso</th>
</tr>
</thead>
<tbody>
<tr>
<td>1892</td>
<td>4,376</td>
<td>507</td>
<td>---</td>
<td>874</td>
<td>741</td>
<td>0.6569</td>
</tr>
<tr>
<td>1893</td>
<td>4,534</td>
<td>436</td>
<td>1,498</td>
<td>724</td>
<td>634</td>
<td>0.5387</td>
</tr>
<tr>
<td>1894</td>
<td>4,077</td>
<td>426</td>
<td>1,507</td>
<td>797</td>
<td>631</td>
<td>0.5136</td>
</tr>
<tr>
<td>1895</td>
<td>4,737</td>
<td>394</td>
<td>1,123</td>
<td>910</td>
<td>691</td>
<td>0.5360</td>
</tr>
<tr>
<td>1896</td>
<td>4,889</td>
<td>531</td>
<td>938</td>
<td>1,050</td>
<td>549</td>
<td>0.5067</td>
</tr>
<tr>
<td>1897</td>
<td>2,398</td>
<td>587</td>
<td>921</td>
<td>1,092</td>
<td>499</td>
<td>0.4484</td>
</tr>
<tr>
<td>1898</td>
<td>2,842</td>
<td>716</td>
<td>1,067</td>
<td>1,134</td>
<td>667</td>
<td>0.4715</td>
</tr>
<tr>
<td>1899</td>
<td>3,217</td>
<td>1,020</td>
<td>1,227</td>
<td>1,306</td>
<td>780</td>
<td>0.4761</td>
</tr>
<tr>
<td>1900</td>
<td>3,159</td>
<td>875</td>
<td>1,279</td>
<td>1,353</td>
<td>798</td>
<td>0.4891</td>
</tr>
<tr>
<td>1901</td>
<td>2,444</td>
<td>700</td>
<td>1,029</td>
<td>1,287</td>
<td>842</td>
<td>0.4405</td>
</tr>
</tbody>
</table>

The average annual profit per mile of the various railways for the years 1892-1901 was:\(^9\)

<table>
<thead>
<tr>
<th>F. C. Mexican</th>
<th>Average annual profit per mile (in pesos)</th>
<th>Relative scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,667</td>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>683</td>
<td></td>
<td>18.6</td>
</tr>
<tr>
<td>1,165</td>
<td></td>
<td>31.8</td>
</tr>
<tr>
<td>1,053</td>
<td></td>
<td>28.7</td>
</tr>
<tr>
<td>619</td>
<td></td>
<td>16.7</td>
</tr>
</tbody>
</table>

The above table shows that the F. C. Central and F. C. Nacional were approximately on a par with each other, as also were the F. C. Interoceánico and F. C. Internacional. But, above all, it demonstrates the superiority of the
F. C. Mexicano and explains why, when competition and cooperation led to the consolidation of the first four lines, the latter remained outside the agreement which created the Ferrocarriles Nacionales de México.
Notes

1. Fred W. Powell: "The Railroads of Mexico" (Boston, 1921), p. 139.

2. The material for this section has been drawn largely from Daniel Cosío Villegas: "Historia moderna de México", VII, 1, (México, D. F., 1965), pp. 530-33, 551-53; Powell, op. cit., pp. 139-43; and Alfred Tischendorf: "Great Britain and Mexico in the Era of Porfirio Díaz" (Durham, N. C., 1961), pp. 46-49, 57, 63.

3. Secretaría de Comunicaciones y Obras Públicas: "Album de los ferrocarriles, año de 1891" (México, D. F., 1892); "Reseña sobre los principales ferrocarriles" (México, D. F., 1892); "Reseña histórica y estadística de los ferrocarriles" (México, D. F., 1905); Mariano Téllez Pizarro: "Apuntes históricos sobre los ferrocarriles de la República Mexicana" (México, D. F., 1904).


8. Miguel A. Quintana: "Los Ferrocarriles Nacionales de México y las tarifas de transporte de Carga".
IV. CONSOLIDATION — FERROCARRILES NACIONALES DE MEXICO: THE NATIONAL RAILWAYS OF MEXICO

The Mexican government, in its capacity as the public authority, had been intimately concerned in the development of Mexico's railway network from the very beginning. However, in the early years, it was content to play a merely passive role, approving or rejecting and cancelling or extending the projects for concessions as they were presented to it by interested private individuals and companies. True, it had encouraged the building of railways by granting subsidies of varying amounts but these merely formed part of the concessions as they were decreed; they were not promised beforehand as a means of stimulating requests for concessions. Thus it is fair to state that the railway network as it emerged in the latter part of the 19th century was almost entirely the creation of private enterprise acting without any overall direction.

However, as the 20th century approached, the situation began to change. By the late 1890's, most of the principal towns and cities of Mexico were served by at least one railway, and, in some cases, by several. In
fact, dearth had turned to abundance and it was now a question of discouraging, rather than encouraging, competition in the building and operation of lines on the more lucrative routes. At the same time, there were still important cities which had no railway connections because the promoters had been discouraged by the difficulty and expense of overcoming the natural obstacles which lay on the routes to these places. This was particularly true of transverse or east-west lines, which faced the twin barriers of the Sierra Madre Oriental and Occidental.

Díaz's Minister of Hacienda, José Ives Limantour, was well aware of the shortcomings of the Mexican railway system and of the need to take more positive action to remedy these defects. In September 1898, he presented a report on the railway situation to Díaz and his cabinet and this was followed by the issuing of the "Ley Sobre Ferrocarriles" of 29 April, 1899. This decree enumerated the lines which the government wished to see built and which it was willing to subsidize and laid down certain standard conditions which were to apply to all concessions issued in the future.
Government intervention went no further at this time and the network which was thus officially advocated developed only slowly; in fact, some of the lines mentioned have still not been built. However, with the opening of the 20th century, the situation again changed. Circumstances and prospects varied from company to company but none could describe its situation as entirely satisfactory. This applied particularly to the northern lines, where scanty traffic, cut-throat competition, the depreciation of silver and the defects of their financial organization (especially in the case of the F. C. Central) combined to undermine the existing structure. The result was not only a deficient service to the community but also the danger that the companies would declare bankruptcy and fall into the hands of one or other of the "empire-building" U. S. railroad trusts.

Therefore, in the light of these circumstances, the government was forced to adopt a policy of more direct intervention in railway matters which culminated in the formation of the Ferrocarriles Nacionales de México, a private company in which the government was the majority shareholder. How far the measures leading to the creation
of this company were part of a conscious, pre-determined policy and how far they were the result of the pressure of events is difficult to say, but at all events the government was happy to use the opportunity to gain more control over the activities of the railway companies, to give the system a more Mexican character and to promise material improvements to the network.

The first step towards increased government intervention was the acquisition of control of the F. C. Interoceánico in 1903. Through this control the government was then able, in about 1905, virtually to blackmail the shareholders of the F. C. Nacional into giving it control of that system, which also gave it control of the F. C. Internacional. Finally, the precarious financial situation of the F. C. Central enabled the government to bring about the consolidation of all three northern trunk lines in the system of the Ferrocarriles Nacionales de México. This undertaking was formed following negotiations with all the parties concerned which lasted from 1906 to 1908. Initially its prospects were good but its development was disrupted by the destruction of property and loss of traffic which occurred during the Revolution and so it
was never able to realize fully the hopes of its creators.

**Limantour's Railway Policy**

In September 1898, José Ives Limantour, the Minister of Hacienda, presented a study on the policy to be followed in railway matters to a council of ministers presided over by Díaz.¹

The main argument of this study stated that during the early stages of the Díaz regime, it had been necessary to encourage the building of railways by all possible means, even at the cost of great sacrifices, and so the government had almost always subordinated its ideas, for example, regarding the routes of lines, to ease the task of the investors which, it was then believed, coincided with those of the community. This policy, justified in an earlier age, was no longer adequate. It was therefore necessary to adopt a well-considered standard of conduct to which the concessions and contracts should be subject and to seek the best possible application of the resources of the nation.

Furthermore, to avoid speculation, it was necessary to ascertain the honesty and financial position of the petitioners and of the guarantees offered for the fulfil-
ment of their obligations and so, to prevent the granting of concessions to those without resources to realize them, Limantour proposed to demand large guarantee deposits in cash or government securities from all concessionaires, whether or not they were to receive a government subsidy, and to be stricter in determining the time limits for construction.

The routes should be clearly fixed to prevent them being extended indefinitely in order to continue to enjoy exemption from import duties on railway equipment during the period of construction since the excessive prolongation of the privileged position of the railways during construction harmed the other sectors of the economy, nullified the effect of the government's protectionist tariff and impeded the industrial development of Mexico. The same observations applied to the period during which the railway and its dependencies and the capital employed in its construction and operation, ordinary and preference shares, bonds and debentures were exempted from all taxes except the stamp tax.

The most important part of the study referred to the need to plan public investment in railways within a
general framework by which the projects would be classified according to the economic needs of the country, the federal interest and the urgency of completion. The lines of primary importance to be built from 1900 onwards were: a) lines joining the central part of the country with the ports of Guaymas or Topolobampo, Mazatlán and Acapulco or Zihuatanejo; b) a line connecting the F. C. Nacional de Tehuantepec with the rest of the system, and which was to be extended to the Guatemalan frontier; c) a short route between Mexico City and Tampico; d) a railway running along the Pacific Coast to join Guadalajara, Tepic, Mazatlán and Guaymas; e) a line from Guadalajara or another point on the F. C. Central to Colima and Manzanillo.

The presentation of the study was followed by the issuing of the "Ley sobre Ferrocarriles" on 29 April, 1899. This was intended to end the anarchy in the matter of concessions and to fix the standards of construction and operation, most of which remain in force today.

The main provisions were to consider as lines of great importance, and the only ones, in consequence, entitled to a subsidy: a) a line to link Chihuahua with a
port in Sonora or Sinaloa; b) a line to link Mexico City with a port in Guerrero; c) a line to link the F. C. Mexicano with the Tehuantepec railway; d) a line from Guadalajara to Tepic and Mazatlán; e) a line from Guadalajara to Colima and Manzanillo; f) a link between the Tehuantepec railway and the Guatemalan frontier; and g) a line to link the Tehuantepec railway with Tabasco and Campeche.

The concessions were to be subject to certain rules. They were not to be granted when their payment would exceed the portion of the budget destined for this purpose; payment was to be made for sections with a minimum length of 100 kms. constructed and approved by the Secretaría de Comunicaciones; the subsidy was always to be paid in public debt bonds and never in cash; exemptions from customs duties and taxes were granted to the companies; e.g. their capital and property would be exempt for 15 years from all federal or local taxes except the stamp tax; the states could never tax lines running through two or more states or their capital or borrowings; the companies could import for a period not longer than 5 years the fixed material for the track and telegraph, locomotives
and rolling stock and some construction machinery and its parts. The concessions were only to be granted to companies able to prove that they had been organized according to the laws of the country from which they proceeded and to have in the bank, or assured, the subscription and payment of the capital necessary to carry out the surveying of the line and the drawing up of plans; once its request was accepted in principle, the company was to give a deposit of 200 pesos per km. projected in consolidated public debt bonds.

The companies were forbidden to transfer, mortgage, or alienate in any way their concession, property or the rights conceded, to any foreign government or State or admit one as a partner; any act in this direction would render the concession void; any financial bond issued by a company that was acquired by a foreign government would become the property of the Mexican nation. All concessions were to be granted for a maximum period of 99 years with no extensions; at the end of this time, the railway and all its physical dependencies would pass in good condition and free of all charges to the Mexican nation; if necessary, the government could reinvest
the earnings of the railway during the last five years before reversion; no concession was to constitute a monopoly but during ten years no other concession would be granted in a zone whose width was subject to determination nor after this period were subsidies or exemptions from customs duties to be granted to the railways to whom concessions had been granted. The companies were always to be Mexican, even when they were organized abroad or when all their members were foreigners; the companies were to be subject to the Mexican courts and they, and all concerned in their affairs, were to be considered as Mexicans in everything relating to these companies.

In short, through this law, the railways were subject to the federal government in the following matters: taxes and duties of any kind on the railway tracks and their dependencies, the fulfilment of the obligations imposed on the concern by its concession or the federal dispositions, the total or partial cancellation of the concessions, expropriation by reason of public utility, rates and charges, general service regulations, the construction and repair of the works, crimes against the
safety, preservation and operation of the works, collisions and derailments, the violation of laws and fiscal regulations, the violation of the mails, mortgages and financial obligations, which were to be registered in Mexico City, and all questions affecting the ownership of the lines. Thus, the government was placed in the position of being able to rationalize the granting of concessions, subsidies and the control of the functioning of the companies.

Limantour continued to observe closely the situation of the railways in Mexico and in the early 1900's noted the precarious financial position of the northern lines (F. C. Central and F. C. Nacional) which was attributable largely to the sparse traffic, ruinous competition (rate wars, pools and competing parallel lines) and the falling silver exchange rate. He was also aware of the danger that one or more of the rival U. S. railroad trusts of Harriman, Hill and Gould would take advantage of these difficulties to acquire the shares of these railways either by adjudication or public auction and consolidate them in their U. S. systems. This threatened to create an excessive in-
fluence or even a monopoly in Mexico.

In consequence, the government gradually evolved a policy towards the railways in the early 1900's, largely in response to the changing circumstances of the railway companies. The main aims of this policy were to prevent the absorption of the Mexican lines by the U. S. railroad systems, to improve the Mexican railway system both in regard to the location of lines and the convenience and cheapness of the service and to facilitate the financial reorganization of the companies which, due to a lack of resources and credit, were experiencing difficulty in improving their equipment and extending their lines.

Limantour presented a report on the railway situation dated 20 July, 1903, to President Díaz. This was followed over the next 5 years by a series of measures by which the Mexican government acquired control over the main northern lines, culminating in the formation of the Ferrocarriles Nacionales de México, a private company in which the government held a majority of the votes, to consolidate the ownership of the F. C. Central, F. C. Nacional and F. C. Internacional.
Acquisition of Control of the F. C. Interoceánico (1903)

Limantour, who was fully conscious of the situation of the various railways, realized that the F. C. Nacional must acquire an outlet to the Gulf of Mexico in order to compete with the F. C. Central's line to Tampico. The government was unlikely to authorize the construction of another line to the coast and so the F. C. Nacional must purchase one of the three existing lines. The F. C. Central and the F. C. Mexicano were both unlikely to sell, which left the F. C. Interoceánico. The government determined to prevent the consolidation of the British-owned F. C. Interoceánico with the F. C. Nacional which was dominated by a New York syndicate. Therefore, to prevent this take-over, it decided to acquire control of the F. C. Interoceánico itself and thus, incidentally, also acquired the means of dominating the F. C. Nacional.

For the consolidation of 1896, the F. C. Interoceánico had issued two series of 7% A and B bonds to the value of $1,206,000 which were redeemable by the company at any time at 110% of their nominal value. The high rate of interest (7%) meant that the company was
unable to pay anything to the holders of the B bonds after covering the interest on the A bonds. Consequently, following negotiations, the company agreed with the A and B bondholders on the creation of a new class of Second Preference 4½% bonds to redeem the series A bonds and pay some interest on the series B bonds; the new bonds would give the right to vote at the general meetings at the rate of one vote for every £2 of their nominal value. The aim of the new issue was to decrease the rate of interest, to redeem the 7% A bonds and to make the improvements necessary to make the line profitable.

A total of £1,300,000 in 4½% bonds were created, of which £200,000 were to improve the physical property of the undertaking, £950,000 were to redeem the 7% A bonds and the remaining £150,000 were to be put into circulation after 1905 in agreement with the holders of the other bonds chargeable to the company. Of the bonds to be issued immediately, £150,000 were sold at 90% of their nominal value which left £1,000,000 still to be issued. At the rate of one vote for every £2 invested in the F. C. Interoceánico, the ownership of these bonds would confer control of the concern and so the
New York banking firm of Speyer & Co., the dominant shareholder in the F. C. Nacional, attempted to acquire the whole of the remainder of the issue, offering 0.8 more than their price (i.e., 90 1/8). Limantour offered the same price and the F. C. Interoceánico management, who were anxious not to be taken over by a U. S. trust, accepted. The government thus obtained control of the F. C. Interoceánico by buying £1,000,000 in bonds at 90 1/8, i.e., by paying £901,250 in cash. The price was paid from treasury reserves in Europe (£428,502) and with bank loans covered by G Debt Public Treasury bonds (£472,748). In this way, the government obtained absolute control of the F. C. Interoceánico (500,000 votes) for little more than 10,500,000 pesos (Mexican currency).

Acquisition of Control of the F. C. Nacional

The directors of the F. C. Nacional, who were still anxious to obtain an outlet over the F. C. Interoceánico, now proposed to the government that the F. C. Nacional, F. C. Internacional and F. C. Interoceánico should be operated jointly and that the government should buy a small part of the shares owned by Speyer & Co. This
proposal was rejected by the government but after long negotiations, an agreement was reached whereby the F. C. Nacional obtained control of the F. C. Interoceánico whilst, in return, the government obtained effective control of the F. C. Nacional.

By the terms of this agreement, the government promised not to authorize for a certain number of years the construction of lines parallel to those of the F. C. Nacional in a 50 km.-wide stretch along the eastern part of the U. S.-Mexican border. The government also agreed to transfer control of the F. C. Interoceánico for U. S. $4,500,000 in cash. In exchange for the $4,500,000, the value of the F. C. Interoceánico shares, the bankers agreed to hand over a corresponding number of F. C. Nacional shares and to transfer a block of shares which, counting the $4,500,000 mentioned above, would amount to $9,000,000; the number of shares transferred by the financiers to the government was to be not less than 40% of those issued.

With this proportion (40%), the government would obtain practical control of the F. C. Nacional because of the normally limited attendance at the general meet-
ings. But the government wished to obtain more effective control over the F. C. Nacional. Therefore, in agreement with the bankers, a part of the ordinary shares were changed into two groups, postponing the right of one group to receive dividends but retaining their right to vote; these postponed-dividend or deferred shares would be worth less and so the government could buy more shares for the same money, since the bankers agreed to sell the deferred shares at $10 each.

Speyer & Co. sent a circular to the ordinary shareholders proposing this operation and in response, of the 333,500 old ordinary shares, 318,864 were converted into 212,376 A shares and 166,288 B shares, leaving 14,636 old shares in circulation which were gradually converted. Thus, in exchange for $9,000,000, Speyer & Co. transferred to the government 100,000 Preference shares, 93,439 Second Preference shares and 106,288 Postponed or Deferred shares, giving a total of 299,727 shares. Consequently, out of a total number of F. C. Nacional shares of 634,137, the government owned 47\%\%, thus lacking 2 3/4\% to ensure absolute control of the company.

The real value of the shares at the moment the con-
tract was closed may be calculated as follows:

100,000 Preference shares at 47 3/4% $4,775,000

93,439 Second Preference shares
(taking into consideration
that the ordinary shares were
quoted at 24 3/4 and holders
of 3 ordinary shares would
receive in exchange 2 Second
Preference shares and $10 in
cash) at 32.12\% 3,001,728

106,288 Deferred shares at 10 1,062,880

TOTAL $8,839,608.

This was $160,392 or \(\frac{1}{2}\%\) less than the $9,000,000 actually paid by the government for the shares. Thus, for
\(\frac{1}{2}\%\) more than the market value of the shares in London
or New York, the government obtained almost half of the
capital of the F. C. Nacional in one single operation
and with the bankers running the risk inherent in with­
drawing such a large number of shares from circulation
in so short a time. The government paid about 22,000,000
pesos for the shares of the F. C. Nacional; also, since
it sold government bonds which produced more interest
than the product of the shares purchased, the government
also had to pay a difference of 660,000 pesos p.a. until
the formation of the Ferrocarriles Nacionales de México
again altered the financial position of the railways.
vis-à-vis the government. Thus the government obtained effective control of the F. C. Nacional and through it, of the F. C. Internacional, and indirectly retained its control of the F. C. Interoceánico.

The Financial Position of the Northern Lines

The financial position of the F. C. Nacional, which had been reorganized in 1902, was basically satisfactory: it was able to cover the servicing of its bonded debt, had only an average-sized floating debt and had paid a fairly regular 2% dividend on its First Preference shares. But it lacked sufficient means to extend its lines, being authorized to dispose each year of only $500,000 in mortgage bonds to improve its existing lines and increase its rolling stock and workshop facilities and to issue only $10,000 in bonds for each new mile of standard gauge line and $7,500 per mile of narrow gauge constructed; this was insufficient to cover the costs of construction.

The financial position of the F. C. Internacional, which was already controlled by the F. C. Nacional, was also reasonably sound. It had exhausted its right to issue mortgage bonds in 1903, except for the sum of $2,497,000 of which only $200,000 were destined for improvements and
additions, the balance of $2,297,000 being destined to cover the cost of the projected line from Cuatro Ciénegas to Sierra Mojada and the extension of the Durango line to Guanaceví, at the rate of $10,000, the nominal value per mile constructed; this was completely insufficient for the purpose. But the undertaking easily paid the interest on its consolidated debt, had no floating debt and had funds sufficient to pay the dividends promised although in fact it used them to improve its lines and buy rolling stock.

The financial position of the F. C. Central, the largest railway in Mexico, was, however, by no means as satisfactory. In fact, the company was on the verge of bankruptcy and was quite unable to extend its main line or build branches or even to repair its track and rolling stock. The reasons for the F. C. Central's distress were the overcapitalization of the concern, the excessive initial cost and poor localization of many of its lines, the lack of traffic and the competition from the newly-modernized and government-backed F. C. Nacional.

The overcapitalization was chronic. The F. C. Central was authorized by the mortgage deed of its 4% consolidated bonds to issue these bonds up to a total of
$32,000 per mile with the aim of building or acquiring new lines. The total length of lines subject to the obligation of the above-mentioned mortgage on 15 May, 1902, was 2,689.13 miles which gave the company the right to issue bonds up to a total amount of $86,052,000, nominal value. From that date until 1906, the total issue of the said bonds reached the figure of $109,020,000 corresponding to 3,406.87 miles which equalled the total length of the F. C. Central's lines with the exception of about 22 miles of sidings and double track. However, the rapid expansion of the F. C. Central system in a relatively short time made it difficult to sell the number of bonds corresponding to the length of line built whilst the poor localization of some lines and the excessive amount paid for some purchases prevented the company from covering the charges imposed by its growing debts with the revenues from operation. Only the government subsidy enabled the company to pay the interest on the above debts; the company was constantly contracting new debts and was obliged to defer payment on some of its old ones so that by 1906 it was nearly bankrupt.
Negotiations with the F. C. Central

The government began negotiations with the F. C. Central which initially proposed that the government should buy enough of its shares to help it out of its difficulties. The government refused since the financial condition of the F. C. Central precluded a simple purchase of its shares but at the same time it set out the bases for negotiations with the F. C. Central. These stipulated that the consolidation was to include all of the lines belonging to the F. C. Central and F. C. Nacional; control by the government was to be obtained without any expenditure in cash or government debt bonds or securities of any other kind; the cooperation of the principal creditors was to be assured; the guarantee of the Mexican nation was to be given to that part of the debt not contained within the first mortgage of all the properties of the company, which entailed the constitution of two classes of bonded debt: bonds guaranteed exclusively with the first mortgage and bonds occupying a second place which would also enjoy the government guarantee; the total servicing of the company's debts from the first financial
year onwards, was not to amount to a sum exceeding the net annual revenue from all the consolidated lines, calculating the said revenue according to the results of the last year of operation and adding resources proceeding from other sources; funds or the means of obtaining them for the construction or purchase of new lines and for the improvement and equipment of the existing ones were to be provided and finally the "nationalization" or "mexicanization" of the railways was to be achieved by the transfer of all the property belonging to the foreign-owned and foreign-based companies about to be consolidated to a Mexican company, constituted in Mexico and administered by a board of directors domiciled in Mexico City.

Throughout 1906, long and difficult negotiations continued between Limantour and the principal shareholders of the F. C. Central, the bankers of the various companies concerned, the firms which issued the bonds of these undertakings and the representatives of the main groups of creditors of the companies. Finally, agreement was reached in December 1906 about the structure of an arrangement resting on the bases set by Limantour which
was to be developed into a definite settlement after the Executive had obtained the necessary authorization from Congress.

Congress was about to close its session, but in view of the importance of the matter, it prorogued its session and on 26 December, 1906, it granted to the Executive the powers necessary to complete the incorporation and conclude the relevant agreements. The resolution of 26 December, 1906, ran as follows:

THE LAW OF DECEMBER 26, 1906

The Congress of the United Mexican States resolves:

Article 1. That the Federal Executive be authorized to constitute, by means of one or more decrees, a Mexican stock company or society of limited responsibility and domiciled in the capital of the Republic, which shall have for its object to incorporate the properties of the National Railway of Mexico and the Central Mexican Railway, with power to acquire, construct, and operate any other railway lines within the national territory, and to perform all acts or operations and to enter into all contracts conformable with the purpose of the present authorization.

In the decree or decrees which are issued the Federal Executive shall fix the constructive bases, which in his judgement may be most fitting, and the special requirements, both in essence and in form, requisite in order that the society may have legal capacity and may accomplish the purposes of its institution.

Article 2. The Federal Executive is also empowered to celebrate the agreements and ar-
rangements which he may deem conducive to the end of bringing about the incorporation set out in the above articles subject to the following restrictions:

I. The Federal Government shall represent, in its own right, in the company or society to be constituted, an amount of stock sufficient to give a majority of votes in the general stockholders' meeting.

II. The equivalent, by means of which the amount of stock giving a majority of votes referred to in the preceding section is obtained, shall not consist of any disbursement of money at the charge of the Federal Treasury, nor in the emission of public-debt certificates; but the Executive is authorized to exchange for stock of the new company that of the National Railway of Mexico belonging to the Nation, and also to execute the subsidiary guaranty of the Federal Government in favor of one of the classes of mortgage bonds which the new company or society may issue, provided that the bonds guaranteed do not bear interest greater than 4 per cent yearly.

III. The issue of bonds guaranteed by the Government shall be limited to an amount necessary only to convert a part of the certificates which the companies whose properties are to be taken over may have in circulation and to provide the funds required by the new company for expenses of incorporation, construction, or purchases of new railway lines, or the certificates of transport enterprises or companies, and, lastly, the betterment and equipment of the said lines and of those already existing.

IV. The stock or certificates, which secure to the Federal Government the majority of votes referred to in the first section of this article shall not be alienated, nor in any way hypothecated, without express authority from the Congress of the Union.

V. In the agreements or arrangements which the Federal Executive may enter into by virtue of the present authorization, there shall not
be modified in any manner the concessions of the companies whose properties may be incorporated or acquired.

Article 3. The Federal Executive shall, at an opportune time, give an account of the use he has made of the powers granted by this law.\(^3\)

Despite great activity on the part of all concerned, however, external circumstances prevented the issue of the decree regarding the formation of the Ferrocarriles Nacionales de México until 6 July, 1907.

**Formation of the Ferrocarriles Nacionales de México**

Under the powers granted by Congress in the Law of 26 December, 1906, President Díaz issued a decree regarding the formation of the Ferrocarriles Nacionales de México on 6 July, 1907. This began as follows:

**DECREE OF 6 JULY, 1907:**
**RAILWAY CONSOLIDATION ACT.**

Article 1. There shall be formed a Mexican stock company of limited liability between the Mexican Government of the one part, and seven or more stock holders of the National Railway Co. of Mexico and of the Central Mexican Railway Co. (Ltd.) of the other part, who may agree to exchange their stock for stock of the new company. This company shall be known as the National Railways Co. of Mexico, and shall have its domicile in the capital of the Republic.

Article 2. The object of the company shall be to consolidate the properties of the National Railway Co. of Mexico and of the Central
Mexican Railway Co., with power to acquire, construct and operate any other railway lines within the national territory and to perform all acts or operations, and to enter into all contracts conformable with the purpose of the law of December 26, 1906. 4

The main provisions of the decree stipulated that the initial capital of the company was to be fixed at 460,000,000 pesos divided into 60,000,000 pesos First Preference shares, 250,000,000 pesos Second Preference shares and 150,000,000 pesos Ordinary shares, all of which shares, upon being issued and for whatever purpose issued, were to be wholly exempt from taxation; the rights of each class of share for payment of the dividend (4% for First Preference, 5% for Second Preference) and in the case of liquidation were established; all shares of the company were to confer an equal right to vote in the general shareholder's meeting except that First and Second Preference shareholders were to have the right to elect separately one and four directors respectively; any taxes imposed on dividends or the reimbursement of shares in Mexico were to be charged by the company to the general expense account; shareholders were to receive the full amount due to them. The shares constituting the initial capital of the company were to
be preferentially applied to the acquisition of the properties of the F. C. Nacional and of the F. C. Central and the stock and bonds which the said companies had in circulation.

The company was empowered to issue two classes of obligations: "Preferred mortgage bonds" and "Ordinary mortgage bonds". The "Preferred mortgage bonds" were to pay interest at the rate of $4\frac{1}{2}\%$ p.a. and the payment of the capital sum represented thereby was to begin in 1917 through a sinking fund and to be completed by 1957; the total amount of these bonds was not to exceed 460,000,000 pesos but payment thereof might be made with a premium not exceeding 5% of their face value. The "Ordinary mortgage bonds" were to pay interest at the rate of 4% p.a. and the payment of the capital was to begin in 1937 through a sinking fund and to be completed by 1977; the total amount of these bonds was not to exceed 372,000,000 pesos. Besides the guarantees constituted by the company in favour of these bonds (a lien or mortgage on all or part of the concessions, property or other wealth owned then or later by the company), the government guaranteed unconditionally the
payment of the bonds in principal and interest, including the amounts set apart for the sinking fund, which guarantee was to be stated in each bond. If, on account of the above guarantee, the government should make any disbursement, it would be considered as the creditor of the company for the amount it paid, with the right to have the said amount reimbursed from the proper revenues at the rate of 4% p.a.; except in the case of liquidation, the said reimbursement was to be made solely from distributable net profits before any dividend was paid except as guaranteed in the foundation deed of the company.

The company was to be managed by a board of directors in Mexico City composed of 21 members of whom 9, at most, might reside in foreign countries, constituting in New York City a local board which might hold its meetings separately. The company was to last 99 years from the date of the decree. Finally, the values represented by the shares or bonds of the company might be expressed in dollars, pounds sterling or other foreign money or in Mexican gold pesos and the same applied to the payment of dividends, interest and the redemption of shares and bonds.
Negotiations continued throughout 1907 since final agreement was delayed by the economic crisis of that year. There were two sides to the negotiations regarding the take-over of the F. C. Central and the formation of the Ferrocarriles Nacionales de México. Firstly, negotiations were carried on with the principal shareholders and creditors of the companies concerned, (this agreement was formulated in the decree of 6 July, 1907) and, secondly, negotiations took place with the bankers regarding the exchange of shares in the existing companies for shares in the new company. These negotiations led to the agreement signed on 29 February, 1908, between the Mexican government and the firms of Speyer & Co., Kuhn, Loeb & Co., Hallgarten & Co., Ladenburg Thallmann & Co., all of New York, Speyer Brothers, of London, and Berliner Händelsgesellschaft und Bank für Händel und Industrie, of Berlin, all of whom represented the shareholders and creditors.

**Capital of the Ferrocarriles Nacionales de México**

To simplify the exchange operation, the new company was to have as many classes of shares as the existing company which had the most number, in this case, the
F. C. Nacional. Thus the decree of 6 July, 1907 stipulated that the Ferrocarriles Nacionales de México were to have First Preference (4%), Second Preference (5%) and Ordinary shares.

The capital of the existing companies at the moment of consolidation was:

<table>
<thead>
<tr>
<th>Authorized issue</th>
<th>Shares in circulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. C. Nacional</td>
<td></td>
</tr>
<tr>
<td>Shares:</td>
<td></td>
</tr>
<tr>
<td>Preferential</td>
<td>U.S.$32,000,000</td>
</tr>
<tr>
<td></td>
<td>U.S.$28,832,925*</td>
</tr>
<tr>
<td>Second Preference</td>
<td>22,233,333 1/3</td>
</tr>
<tr>
<td></td>
<td>22,030,600</td>
</tr>
<tr>
<td>Deferred</td>
<td>11,116,666 2/3</td>
</tr>
<tr>
<td></td>
<td>11,015,300</td>
</tr>
<tr>
<td>Ordinary (old ones)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>304,100</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$62,182,925</td>
</tr>
</tbody>
</table>

*plus $3,167,075 held by the company itself.

Of these, the following were owned by the government:

<table>
<thead>
<tr>
<th>Guaranteed debt</th>
<th>$31,272,290</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. C. Central</td>
<td></td>
</tr>
<tr>
<td>Shares:</td>
<td>$100,000,000</td>
</tr>
<tr>
<td></td>
<td>$59,127,100</td>
</tr>
<tr>
<td>Guaranteed debt:</td>
<td>$208,122,225</td>
</tr>
</tbody>
</table>

Total sum of shares issued by the two companies:

| $121,310,025 |

(F. C. Internacional, controlled by F. C. Nacional)

| Guaranteed debt | $17,705,500 |

| Shares:         | $20,708,200 |

| Guaranteed debt:| $17,705,500 |
The decision was made to convert the unconsolidated debt of the F. C. Central into shares so, for the purposes of the exchange operation, the 3% Income bonds of the F. C. Central were assimilated to the shares of that company and exchanged for Second Preference shares of the Ferrocarriles Nacionales de México with no distinction other than a small premium of 10% in favour of the First Series of Income bonds.

It was a prerequisite that the government should hold a majority of votes in the new company. The government already held 47\(\frac{1}{4}\)% of the shares, and therefore effective control, of the F. C. Nacional but it had no say in the affairs of the F. C. Central except in its capacity as the public authority. Therefore, it was necessary to come to an agreement with the F. C. Central shareholders whereby the government would obtain control of the undertaking. The shareholders who possessed control of the F. C. Central laid down the precondition that they would only hand over part of their shares although they were willing to convert those they retained into bonds of the new company under the same terms by which the rest of the F. C. Central shares were to be
converted. In short, they were willing to yield control to the new company organized under the patronage of the Mexican government, but they were not willing to sell the majority of the shares. However, the difficulties were finally resolved and an agreement was reached. The F. C. Central had in circulation 591,270 ordinary shares with a nominal value of $100 each and so, to insure control, the government needed at least 295,636 shares. The F. C. Central shareholders agreed to sell to it 200,000 shares which had a market value of $5,600,000 and to exchange another 100,000 shares for an equal number of shares issued by the Ferrocarriles Nacionales de México. The difference of $2,400,000 between the market value and the price paid was to account for the shareholder's obligation to exchange 100,000 shares. Thus the government acquired 300,000 shares of the F. C. Central and with them, control of this company.

The question of payment was also resolved. The government had stipulated that the acquisition of the F. C. Central was not to involve it in any disbursement. Furthermore, the government guarantee in favour of the "Ordinary mortgage bonds" of the Ferrocarriles Nacionales de México deserved some compensation, es-
especially as the bonds guaranteed by the government were not to be applied exclusively to the incorporation of the F. C. Central but also to the exchange of F. C. Nacional bonds which were already under government control. The bankers therefore agreed that the Ferrocarriles Nacionales de México would hand over to the government the number of bonds necessary to cover the price of $8,000,000 and the government paid the price stipulated by the F. C. Central shareholders with these bonds. It then exchanged the F. C. Central shares thus acquired for an equal number of Second Preference shares of the Ferrocarriles Nacionales de México. Thus the government acquired a majority of votes without making any disbursement.

Consequently, the capital of the Ferrocarriles Nacionales de México was fixed taking into consideration the following factors: the capital of the companies being merged, the debts of the existing companies which were to be converted into shares of the new one and the need to assure a government majority of the shares. This resulted in the following calculation:
Shares of the F. C. Central and F. C. Nacional  

<table>
<thead>
<tr>
<th></th>
<th>U. S. $</th>
<th>Mex. pesos</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>121,310,025</td>
<td>242,620,050</td>
</tr>
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</table>

To convert the unconsolidated bonded debt of the F. C. Central, to offer premiums and to round off the figures of the new issue  

<p>| | | |</p>
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<tbody>
<tr>
<td></td>
<td>44,959,975</td>
<td>89,919,950</td>
</tr>
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</table>

To complete the government majority of shares  

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<tbody>
<tr>
<td></td>
<td>63,730,000</td>
<td>127,460,000</td>
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</table>

Total capital of the Ferrocarriles Nacionales de México  

<p>| | | |</p>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>230,000,000</td>
<td>460,000,000</td>
</tr>
</tbody>
</table>

The capital of the Ferrocarriles Nacionales de México was, therefore, represented by 2,300,000 shares with a nominal value of 200 pesos each divided as follows:

<table>
<thead>
<tr>
<th></th>
<th>Pesos</th>
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<tbody>
<tr>
<td>300,000</td>
<td>60,000,000</td>
</tr>
<tr>
<td>1,250,000</td>
<td>250,000,000</td>
</tr>
<tr>
<td>750,000</td>
<td>150,000,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>460,000,000</td>
</tr>
</tbody>
</table>

The First Preference shares had the right to receive a 4% dividend before any distribution to the other shares and the undertaking guaranteed them a minimum dividend of 2% for the first 3 years besides being redeemable at any time. The Second Preference shares had the right to receive a 5% dividend as soon as that of the First Preference shares was covered. Anything left over was to be distributed amongst the ordinary shareholders.
These shares were issued in order to be exchanged for a part of the shares and bonds of the F. C. Central, to be exchanged for the shares of the F. C. Nacional and to give to the government a certain number of shares in exchange for the government guarantee on the mortgage bonds to be issued later by the company. They were distributed in this fashion:

<table>
<thead>
<tr>
<th>Shares</th>
<th>To be exchanged for securities of F. C. Central</th>
<th>To be exchanged for securities of F. C. Nacional</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Pref.</td>
<td>---</td>
<td>57,700,000 pesos</td>
</tr>
<tr>
<td>Second Pref.</td>
<td>201,100,000 pesos</td>
<td>48,900,000 &quot;</td>
</tr>
<tr>
<td>Ordinary</td>
<td>---</td>
<td>22,000,000 &quot;</td>
</tr>
<tr>
<td>TOTAL</td>
<td>201,100,000 &quot;</td>
<td>128,800,000 &quot;</td>
</tr>
</tbody>
</table>

(cont'd.)

<table>
<thead>
<tr>
<th>Shares</th>
<th>To give to govt.</th>
<th>Owned by company</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Pref.</td>
<td>---</td>
<td>2,300,000 pesos</td>
</tr>
<tr>
<td>Second Pref.</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Ordinary</td>
<td>127,500,000 pesos</td>
<td>300,000 &quot;</td>
</tr>
<tr>
<td>TOTAL</td>
<td>127,500,000 &quot;</td>
<td>2,600,000 &quot;</td>
</tr>
</tbody>
</table>

The Ferrocarriles Nacionales de México were also authorized to issue two series of mortgage bonds up to a total value of 770,000,000 pesos, namely, 450,000,000 pesos of "Preferred mortgage bonds" at 4½% redeemable in 50 years and 320,000,000 pesos of "Ordinary mortgage bonds" at 4% guaranteed unconditionally in principal.
and interest by the government and redeemable in 70 years.

These bonds were distributed in the following way: (all figures refer to pesos)

<table>
<thead>
<tr>
<th>Purpose</th>
<th>4½% Preferred</th>
<th>4% Ordinary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be exchanged for bonds of F. C. Central</td>
<td>181,000,000</td>
<td>77,100,000</td>
<td>258,100,000</td>
</tr>
<tr>
<td>To be exchanged for bonds of F. C. Nacional</td>
<td>46,000,000</td>
<td>75,500,000</td>
<td>121,500,000</td>
</tr>
<tr>
<td>To pay govt. for shares of F. C. Central (as agreed $8,000,000)</td>
<td>12,000,000</td>
<td>4,900,000</td>
<td>16,900,000</td>
</tr>
<tr>
<td>For construction of Mexico City-Tampico line</td>
<td>20,000,000</td>
<td>12,000,000</td>
<td>32,000,000</td>
</tr>
<tr>
<td>To construct &amp; acquire new lines</td>
<td>76,000,000</td>
<td>38,000,000</td>
<td>114,000,000</td>
</tr>
<tr>
<td>To improve own lines</td>
<td>95,000,000</td>
<td>99,000,000</td>
<td>194,000,000</td>
</tr>
<tr>
<td>To pay floating debt of F. C. Central &amp; F. C. Nacional</td>
<td>20,000,000</td>
<td>13,500,000</td>
<td>33,500,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>450,000,000</td>
<td>320,000,000</td>
<td>770,000,000</td>
</tr>
</tbody>
</table>

As the government guaranteed the full payment of the principal and interest on the complete issue of the 4% "Ordinary mortgage bonds" under the same conditions as the "Preferred mortgage bonds", it received 127,460,000
pesos in Ordinary shares of the Ferrocarriles Nacionales de México in recompense. It was also stipulated that any expenditures made by the government under this guarantee were to be considered as claims against the company and to earn 4% interest; these claims were to be preferred after those of the mortgage and were to be paid before any dividends. In exchange, the government renounced its right to enforce payment.

These arrangements together gave an absolute majority in the new company to the government. The government possessed 1,150,022 of the 2,300,000 shares issued, representing 230,004,580 pesos of the 460,000,000 pesos capital, distributed as follows:

<table>
<thead>
<tr>
<th>Shares Received</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Pref.</td>
<td>for 100,000 First Pref. shares of F. C. Nacional owned by govt.</td>
<td>20,000,000 pesos</td>
</tr>
<tr>
<td>Second Pref.</td>
<td>for 93,439 Second Pref. shares of F. C. Nacional owned by govt., at rate of 100 of latter for 110 of former</td>
<td>20,556,580 &quot;</td>
</tr>
<tr>
<td>Second Pref.</td>
<td>for 200,000 shares of F. C. Central bought by govt.</td>
<td>40,000,000 &quot;</td>
</tr>
<tr>
<td>Ordinary</td>
<td>for 109,940 deferred shares of F. C. Nacional owned by govt.</td>
<td>21,988,000 &quot;</td>
</tr>
<tr>
<td>Ordinary</td>
<td>for guarantee on 4% mortgage bonds</td>
<td>127,460,000 &quot;</td>
</tr>
<tr>
<td>Total</td>
<td>Total amount of shares owned by govt.</td>
<td>230,004,580 &quot;</td>
</tr>
</tbody>
</table>
To complete the operation, it was necessary for the great majority of shareholders of both the existing companies to exchange their securities for those of the new company. The method of securing this was arranged by an agreement between the bankers and the government known as the "Agreement for adjustment and union of the Mexican Central Railroad Co. (Ltd.) and the National Railroad Co. of Mexico" of 29 February, 1908, which was reissued with a few modifications on 6 April, 1908. The main conditions of the agreement stated that the bankers were to undertake all necessary action to ensure that the holders of the shares and bonds exchange them for those of the new company; the bankers had the right to declare the plan "effective" in view of its public reception and did not incur any definite obligations until the plan was declared effective; if the plan failed instead of being declared effective, the government incurred no obligations with the bankers unless the government or the company failed to fulfil some part of the agreement.

Certain securities were excluded from the conversion plan. These included 2 classes of mortgage bonds of the F. C. Nacional, namely the issue of bonds to the
value of $23,000,000, earning 4½% interest p.a., and the issue of bonds of which $27,289,000 were still in circulation in 1908 and which earned interest at 4% p.a. Both classes of bonds were popular and enjoyed high quotations and so would cost a lot to convert. As both fell due in the distant future, it was decided to postpone their conversion until later, when, it was hoped, the securities of the new company would have increased in value. Some short-term debts had been contracted by the F. C. Central for the purchase of rolling stock or for merely administrative purposes and, in accordance with traditional procedure, these debts were left to the charge of operating expenses.

However, all the other securities of both systems were included in the conversion scheme. The main securities concerned were: the 5% promissory notes of the F. C. Nacional, the First Preference shares of the F. C. Nacional, the Second Preference shares of the F. C. Nacional, the Ordinary and Deferred shares of the F. C. Nacional, the old bonds and provisional 7% certificates of the First Mortgage of the F. C. Central, the 5% priority bonds of the F. C. Central, the 4%
consolidated mortgage bonds of the F. C. Central, the consolidated income bonds and certificates and the old income certificates of the F. C. Central, the 5% promissory notes of the F. C. Central with 3 and 4 year expiry dates and the shares of the F. C. Central.

By 31 October, 1907, the following securities had been exchanged:

<table>
<thead>
<tr>
<th>Securities</th>
<th>Securities issued ($)</th>
<th>Still in circulation ($)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F. C. Central</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% Preference bonds</td>
<td>6,597,000</td>
<td>1,460,000</td>
<td>22</td>
</tr>
<tr>
<td>Old 7% bonds</td>
<td>265,062</td>
<td>62,085</td>
<td>24</td>
</tr>
<tr>
<td>4% consolidated mortgage bonds</td>
<td>109,020,000</td>
<td>4,426,000</td>
<td>4</td>
</tr>
<tr>
<td>First Series income bonds</td>
<td>32,706,000</td>
<td>2,268,200</td>
<td>6.9</td>
</tr>
<tr>
<td>Second Series income bonds</td>
<td>11,284,000</td>
<td>450,000</td>
<td>0.4</td>
</tr>
<tr>
<td>Old registered income bonds</td>
<td>325,200</td>
<td>22,200</td>
<td>6.8</td>
</tr>
<tr>
<td>Ordinary shares</td>
<td>59,127,100</td>
<td>870,200</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>F. C. Nacional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Preference shares</td>
<td>32,000,000</td>
<td>142,900</td>
<td>0.4</td>
</tr>
<tr>
<td>Second Preference shares</td>
<td>22,030,600</td>
<td>357,400</td>
<td>1.6</td>
</tr>
<tr>
<td>Old ordinary shares</td>
<td>304,100</td>
<td>277,400</td>
<td>75</td>
</tr>
</tbody>
</table>

To replace these, the bankers put on sale $10,000,000 in Preferred mortgage bonds and $6,750,000 in Ordinary mortgage bonds plus some securities which had gone to
various interested parties in accordance with the financial plan and others which had remained at the disposal of the issuing firms. In consequence, $13,750,000 in Preferred mortgage bonds and $29,500,000 in Ordinary mortgage bonds, giving a total of $43,250,000, were offered to the public. A careful selection was made of the markets on which the public subscription was to be opened, taking into consideration the world-wide economic depression at the time, the general depression of share values, the preference in certain markets for various classes of bonds and the need to protect other Mexican securities which were then being negotiated or about to be negotiated in the European markets. It was finally decided to issue the Preferred mortgage bonds, which at 4½% would be sold nearer par, mainly in England and the 4% Ordinary mortgage bonds mainly in France. The $13,750,000 in 4½% Preferred mortgage bonds were offered to the public in London, Amsterdam and Switzerland on 28 May, 1908, at the price of 94% by Messrs. Henry Schroeder and Co., Speyer Brothers, Hope & Co., Teixeira de Mattos Brothers, Swiss Bankverein and Union Financière de Genève. All
the bonds were immediately subscribed. The $29,500,000 of Ordinary mortgage bonds were placed on sale in Paris on 29 July, 1908, by the Banque de Paris et des Pays-Bas, Union Parisienne, Comptoir National d'Escompte and Société Générale and all were immediately subscribed at the price of 89½%.

Meanwhile the exchange of the securities of the old companies for those of the new continued. Some were exchanged at par (e.g. Deferred shares of the F. C. Nacional for Ordinary shares of the Ferrocarriles Nacionales de México) but various inducements were offered in other cases such as premiums in cash (e.g. Preferred shares of the F. C. Nacional exchanged at par for First Preference shares of the Ferrocarriles Nacionales de México plus 10% in cash). The offer was especially attractive to the holders of F. C. Central securities who found their depreciated certificates suddenly revalued. Consequently, in the first 6 months of 1909, 97.62% of the F. C. Central's shares and bonds were presented for exchange. Of 219,323,862 pesos total issue of the F. C. Central, 212,805,877 pesos were presented for exchange. And of the 65,350,000 pesos total issue of the F. C. Nacional,
65,129,200 pesos were presented for exchange. By 30 June, 1910, the Ferrocarriles Nacionales de México had issued securities for 261,885,615 pesos in exchange for the old securities.

The Ferrocarriles Nacionales de México also made other issues for purposes other than the conversion. By 30 June, 1910, these totalled 63,844,789 pesos in the three different kinds of shares, 33,488,477 pesos in the 4½% bonds (plus 69,942,868 pesos about to be issued) and 20,207,450 pesos in 4% bonds (plus 44,948,375 pesos about to be issued). By the end of 1910, there were about 270,900,000 pesos in bonds in circulation of which 169,600,000 pesos were in 4½% bonds and 101,300,000 pesos were in 4% bonds.

The fixed annual charges of the Ferrocarriles Nacionales de México as a consequence of the consolidation plan were:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest at 4½% on $65,107,262.50 of First Preference bonds</td>
<td>$2,929,826.81</td>
</tr>
<tr>
<td>Interest at 4% on $53,105,600.00 of Ordinary mortgage bonds</td>
<td>2,124,224.00</td>
</tr>
<tr>
<td>2% dividend on $28,833,000.00 of First Preference shares</td>
<td>576,660.00</td>
</tr>
<tr>
<td>Interest at 5% on $19,434,000.00 of promissory notes of the F. C. Central and F. C. Nacional</td>
<td>971,700.00</td>
</tr>
<tr>
<td>Total annual charges</td>
<td>$6,602,410.81</td>
</tr>
</tbody>
</table>
The estimated annual income from the securities owned by the company was: $6,179,612.92

The annual expenses of the company regarding interest, dividends, etc., were: $6,602,410.81

Consequently, the estimated deficit on securities amounted to: $422,797.89.

Conclusion

The system of the Ferrocarriles Nacionales de México thus included the lines of the F. C. Central, F. C. Nacional, and F. C. Internacional and controlled the nominally independent F. C. Interoceánico. The exact length of the system varies according to how many, and which of, the subsidiary lines are included in the estimate, but it was approximately 8,500 kms.

The Ferrocarriles Nacionales de México took possession of the F. C. Nacional, including the F. C. Internacional, on 1 January, 1909, and of the F. C. Central on 1 February, 1909, but it took account of operations from 1 July, 1908. The results were initially satisfactory with gross receipts totalling 48,805,522 pesos in the financial year 1908/09, 52,562,293 pesos in 1909/10, 61,934,421 pesos in 1910/11, and 61,447,791 in 1911/12.
whilst net receipts totalled 19,638,629 pesos in the financial year 1908/09, 20,968,736 pesos in 1909/10, 22,655,076 in 1910/11, and 23,012,536 in 1911/12. Receipts began to drop in 1911, the year in which the Revolution started, and the decline became precipitous after 1913 when the Revolution entered its violent stage. Gross receipts in 1914/15 were only 1,776,982 pesos and net receipts showed a deficit of 45,487 pesos in that year, after which the records cease since the military administration of the railways either kept no accounts or subsequently lost them.

Thus, the development of the new company was disrupted almost at the very beginning and, owing to historical circumstances beyond its control, the full potential of the Ferrocarriles Nacionales de México was never realized.
Notes


5. Cuéllar; Long has 462,000,000 pesos.


7. Francisco Calderón includes all the subsidiaries to give a total of 11,157 kms., Cosío Villegas, op. cit., VII, 1, p. 614.
CONCLUSION

The year 1911 marks a watershed in all aspects of Mexican life. In that year Porfirio Díaz was overthrown and driven into exile and Mexico embarked upon the revolution, at first violent but later institutionalized with a capital R, which has shaped her development up till the present-day.

For the Mexican railways, too, 1911 marks a watershed. Henceforward, their future held in store for them disruption and destruction during the Revolution followed by a slow and laborious recovery during the 1920's and 1930's, complete nationalization in 1937, renovation with American assistance during World War II, and, afterwards, continuing modernization as part of the Mexican government's policy of improving the country's transport system.

The year 1911, therefore, is a good point at which to pause and take stock of the achievements and failures which marked the early development of the Mexican railway system. Certainly, the situation which faced the railway promoters when they first approached the task of constructing lines in Mexico was hardly promising. Difficult
terrain and problematic traffic levels were minor ob­

stacles compared with the political, military and finan­
cial disorders which marked the first 50 years of Mexi­
can independence. Indicative of the difficulties faced
by would-be railway-builders are the 36 years taken to
construct the 470-km.-long F. C. Mexicano from Mexico
City to Veracruz and Puebla. The first concession for
this line was granted in 1837 but no construction resul­
ted until 1850; even then another 23 years and many con­
cessions, contracts and agreements were to elapse before
the line was finally completed and opened in 1873.

Completion of the F. C. Mexicano was followed by a
series of proposals for lines to connect Mexico City with
the U. S. border and the American railroad system. These
proposals raised a storm of protest and counter-protest in
Congress and the press which equalled the furore created
by the F. C. Mexicano. Enthusiasts saw the pesos mounting
up in long black columns and described the projected rail­
ways in terms resembling the second coming of the Saviour
whilst more timid souls painted the figures red and fore­
saw a second coming of Uncle Sam. In the event, the en­
thusiasts won out and in 1880 concessions were granted to
the F. C. Central, which completed its line from Mexico City to Ciudad Juárez in 1884, and to the F. C. Nacional, which opened its line from Mexico City to Laredo in 1888. Meanwhile, in 1881, another concession was granted to the F. C. Internacional, which completed a line linking Durango and Torreón with the U. S. border at Piedras Negras by 1892.

As Porfirio Díaz consolidated his dictatorship, Mexico enjoyed a period of stability and relative prosperity and the previous shortage of railways rapidly turned into abundance and even excess. The most important sign of the new trend was the building of the F. C. Interoceánico which competed directly with the F. C. Mexicano on the Mexico City-Veracruz route, but competing and parallel lines were also built in other parts of the country and the railways resorted to a variety of devices to increase their earnings such as rate wars, receipt pooling arrangements, the building or acquisition of feeders, etc.

However, the traffic potential in Mexico was not sufficient to support all the railways in competition and all of them, with the possible exception of the F. C. Mexicano, found themselves in a disadvantageous position in
one way or the other. The Mexican government, in the meantime, had begun to take a more direct interest in the country's railway network and its possible future development and it used the temporary discomfiture of the foreign-owned companies to force through a consolidation in which it would hold absolute control. This was achieved through the acquisition of control of the F. C. Interoceánico in 1903, the acquisition of control of the F. C. Nacional in 1905 and the arrangement negotiated with the F. C. Central during 1906-08. These moves led to the formation in 1908 of the Ferrocarriles Nacionales de México, a private company in which the government was the majority shareholder, which took over and consolidated the systems of the F. C. Central, F. C. Nacional and F. C. Internacional, and effectively controlled the F. C. Interoceánico. Of the major companies discussed in this study, only the F. C. Mexicano remained independent.

The effect which the railways had on Mexico's economic and social development is beyond the scope of this study. However, some concluding observations might be made about certain topics raised in the course of this
work. The F. C. Mexicana caused a major controversy whilst its various concessions were under consideration, largely on account of the subsidies promised to it, and historians are still arguing over whether or not the amount of subsidy finally paid was excessive or not. Yet the most striking thing about the F. C. Mexicana is not the size of its subsidy but the very fact that it was ever built at all. Considering that it was the first main line railway to be built in Mexico and had to overcome extremely difficult natural obstacles, not to mention man-made obstacles, its completion really was something of an epic achievement.

As to the northern trunk lines, the most interesting question to the modern reader concerning them is their influence on U. S.-Mexican relations. Mexico had lost nearly half her national territory to the United States in 1848 and when the proposals for lines to the U. S. border came up for discussion, many pessimistic predictions were made of future U. S. military intervention and annexation of territory. In the event, history has proved these fears to have been unfounded. Mexico survived intact the era of President Theodore Roosevelt and the "Big
 Stick" and suffered no major American intervention except that ordered (ironically) by President Woodrow Wilson which resulted in the occupation of (even more ironically) the port of Veracruz in 1914. How far this failure to realize earlier fears may be attributed to the building of the railways and how far it was due to domestic political conditions and policy changes in the United States or simply to the fact that the Díaz regime was so amenable to American interests that even Teddy Roosevelt could find no cause for complaint is open to discussion. What is certain, however, is that the railways, even if they made Mexico more accessible to the Americans, also improved communications between Mexico City and the North and enabled the federal government to exercise more effective control over the distant northern states and the border area.

On another level, however, the fears of the opponents of the northern railways have been vindicated. Military intervention and territorial annexation were unnecessary because the railways were essentially vehicles of peaceful economic penetration which linked the Mexican economy to that of its northern neighbour and made Mexico into
the "economic satellite of the United States" described by David Pletcher (q. v.). That this economic penetration frequently amounted to pure exploitation was not really the fault of the railways which were merely means serving an end. In sum, it is well to take a charitable view and to quote the words of Matias Romero, a contemporary colleague of Diaz, on the subject of the northern railways:

President Diaz deserves a great deal of credit for his efforts to promote in Mexico material improvement, especially in railroad building. When he came into power in 1877 public opinion was very much divided as to the policy of allowing citizens of the United States to develop the resources of the country by building railways, working mines, etc. Our experience of what took place in consequence of the liberal grants given by Mexico to Texan colonists made many fear that a repetition of that liberal policy might endanger the future of the country by giving a foothold in it to citizens of the United States who might afterward, if circumstances favored them, attempt to repeat the case of Texas. President Lerdo de Tejada seemed to share such fear, judging by his policy in this regard. But President Diaz, as a broad-minded and patriotic statesman, believed that the best interest of the country required its material development, and that it would not be advisable to discriminate against citizens of the United States, as that country was more interested than any other, on account of its contiguity to Mexico, in developing the resources of our country by building an extensive system of railways, and would, therefore, be more ready than any other to assist in building it. He trusted at the same time that, when the resources of the country should be more fully developed, it would become so strong as to be beyond
reach of the temptations by foreign states or individuals. The results of the work done in Mexico so far show that General Diaz acted wisely, and proved himself equal to the task before him.¹

Unfortunately, however, the "broad-minded and patriotic statesman" failed to foresee the full consequences of his policy of favouring foreign capital, of which railways were only one manifestation. Eventually forces pent up and exasperated by the Diaz regime burst forth and in the cataclysm of the Revolution, the railways were one of the chief sufferers. Thus they received direct retribution for a situation which they, indirectly, had helped to create.

Yet it is only fair to add that if the railways were partly responsible for the conditions the Revolution, they also provided a basis on which the Revolution could later build. For good or bad, the Mexican economy had developed under Diaz and the railways which had been instrumental in these early changes remained to contribute to Mexico's later economic development. "Material improvements" sought at any price are an unworthy goal but once attained they do have intrinsic value and are capable of being turned to new objectives. So it was with the railways in Mexico.

Notes

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APPENDIX
<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Passengers</th>
<th>Receipts from Passengers (Pesos)</th>
<th>Freight carried (Metric tons)</th>
<th>Receipts from Freight &amp; Sundries (Pesos)</th>
<th>Total Receipts (Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1869</td>
<td>152,534</td>
<td>143,804</td>
<td>---</td>
<td>412,534</td>
<td>556,338</td>
</tr>
<tr>
<td>1870</td>
<td>212,722</td>
<td>216,139</td>
<td>78,918</td>
<td>611,032</td>
<td>827,171</td>
</tr>
<tr>
<td>1871</td>
<td>216,260</td>
<td>228,126</td>
<td>92,362</td>
<td>731,498</td>
<td>959,624</td>
</tr>
<tr>
<td>1872</td>
<td>255,004</td>
<td>243,656</td>
<td>102,315</td>
<td>756,754</td>
<td>1,000,410</td>
</tr>
<tr>
<td>1873</td>
<td>476,287</td>
<td>482,565</td>
<td>150,474</td>
<td>1,348,344</td>
<td>1,830,909</td>
</tr>
<tr>
<td>1874</td>
<td>459,601</td>
<td>467,817</td>
<td>121,935</td>
<td>1,887,029</td>
<td>2,354,846</td>
</tr>
<tr>
<td>1875</td>
<td>267,776</td>
<td>476,547</td>
<td>136,632</td>
<td>1,970,009</td>
<td>2,446,556</td>
</tr>
<tr>
<td>1876</td>
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Sources: Secretaria de Obras Publicas y Comunicaciones: "Album de los Ferrocarriles, Año de 1891", Mexico, D. F., 1892; Secretaria de Comunicaciones y Transportes: "Estadística de los Ferrocarriles", Mexico, D. F., 1905.
Table II  
**Dividend record of Mexican Railway Company**  
*(1873-1910)*  
(Average nominal capital)

<table>
<thead>
<tr>
<th>Year</th>
<th>First Preference (₧2,254,100)--%</th>
<th>Second Preference (₧1,011,960)--%</th>
<th>Ordinary (₧2,254,720)--%</th>
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<td>5 - 5</td>
<td>½ - ½</td>
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<td>6 - 6½</td>
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<td>9½ - 14</td>
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<td>8 - 4</td>
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<td>8 - 8</td>
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</tr>
<tr>
<td>1885</td>
<td>8 - 6</td>
<td>3 - Nil</td>
<td>Nil - Nil</td>
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<td>1.5 - Nil</td>
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<td>&quot; - &quot;</td>
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<tr>
<td>1894</td>
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<td>&quot; - &quot;</td>
<td>&quot; - &quot;</td>
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<tr>
<td>1895</td>
<td>1.75 - .50</td>
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<td>&quot; - &quot;</td>
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<tr>
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<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
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<td>Nil - Nil</td>
<td>Nil - Nil</td>
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<td>&quot; - &quot;</td>
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<td>&quot; - &quot;</td>
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**Table III**  
**FERROCARRIL CENTRAL**

Table of passenger and freight traffic and receipts.

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<tr>
<th>Year</th>
<th>No. of Passengers</th>
<th>Receipts from Passengers (Pesos)</th>
<th>Freight carried (Metric, tons)</th>
<th>Receipts from Freight &amp; Sundries (Pesos)</th>
<th>Total Receipts (Pesos)</th>
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</thead>
<tbody>
<tr>
<td>1881</td>
<td>303,543</td>
<td>62,270</td>
<td>7,012</td>
<td>33,413</td>
<td>95,683</td>
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<td>726,830</td>
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<td>2,662,685</td>
<td>3,774,592</td>
</tr>
<tr>
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<td>331,700</td>
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<td>3,595,389</td>
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Sources: as for Table I.
Table IV
FERROCARRIL NACIONAL
(INC. CIA. CONSTRUCTORA)
Table of passenger and freight traffic and receipts.

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<thead>
<tr>
<th>Year</th>
<th>No. of Passengers</th>
<th>Receipts from Passengers (Pesos)</th>
<th>Freight from (Metric Tons)</th>
<th>Receipts from Freight &amp; Sundries (Pesos)</th>
<th>Total Receipts (Pesos)</th>
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Sources: as for Table I.
Table V

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<th>Year</th>
<th>No. of Passengers</th>
<th>Receipts from Passengers (Pesos)</th>
<th>Freight carried (Metric tons)</th>
<th>Receipts from Freight &amp; Sundries (Pesos)</th>
<th>Total Receipts (Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1883</td>
<td>---</td>
<td>1,550</td>
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<td>3,985</td>
<td>5,535</td>
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<tr>
<td>1884</td>
<td>15,942</td>
<td>30,858</td>
<td>15,130</td>
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<td>68,433</td>
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<td>1885</td>
<td>9,853</td>
<td>25,881</td>
<td>50,896</td>
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</tr>
<tr>
<td>1886</td>
<td>10,411</td>
<td>29,243</td>
<td>55,877</td>
<td>144,311</td>
<td>173,554</td>
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<tr>
<td>1887</td>
<td>9,796</td>
<td>32,517</td>
<td>86,080</td>
<td>189,185</td>
<td>221,702</td>
</tr>
<tr>
<td>1888</td>
<td>41,170</td>
<td>125,848</td>
<td>116,561</td>
<td>459,907</td>
<td>585,755</td>
</tr>
<tr>
<td>1889</td>
<td>53,194</td>
<td>140,676</td>
<td>180,544</td>
<td>691,477</td>
<td>832,153</td>
</tr>
<tr>
<td>1890</td>
<td>59,327</td>
<td>149,258</td>
<td>222,856</td>
<td>894,944</td>
<td>1,044,202</td>
</tr>
<tr>
<td>1891</td>
<td>64,641</td>
<td>170,304</td>
<td>216,466</td>
<td>956,547</td>
<td>1,126,851</td>
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<td>1892-96</td>
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<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
</tr>
<tr>
<td>1899</td>
<td>---</td>
<td>583,537</td>
<td>---</td>
<td>3,796,415</td>
<td>4,379,952</td>
</tr>
<tr>
<td>1900</td>
<td>229,391</td>
<td>657,960</td>
<td>770,515</td>
<td>5,063,518</td>
<td>5,721,478</td>
</tr>
<tr>
<td>1901</td>
<td>213,736</td>
<td>610,073</td>
<td>860,201</td>
<td>5,342,081</td>
<td>5,952,154</td>
</tr>
<tr>
<td>1902</td>
<td>231,251</td>
<td>639,337</td>
<td>1,019,065</td>
<td>5,858,154</td>
<td>6,497,491</td>
</tr>
<tr>
<td>1903</td>
<td>237,964</td>
<td>635,913</td>
<td>1,180,416</td>
<td>6,457,244</td>
<td>7,093,157</td>
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<tr>
<td>1904-07</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
</tr>
<tr>
<td>1908</td>
<td>527,752</td>
<td>931,260</td>
<td>1,587,402</td>
<td>7,235,979</td>
<td>8,167,239</td>
</tr>
<tr>
<td>1909-11</td>
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<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
<td>No statistics for these years</td>
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</table>

Sources: as for Table I.
Table VI  
FERROCARRIL INTEROCEANICO

Table of passenger and freight traffic and receipts.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Passengers</th>
<th>Receipts from Passengers (Pesos)</th>
<th>Freight carried (Metric tons)</th>
<th>Receipts from Freight &amp; Sundries (Pesos)</th>
<th>Total Receipts (Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>228,053</td>
<td>65,278</td>
<td>11,431</td>
<td>36,515</td>
<td>101,793</td>
</tr>
<tr>
<td>1881</td>
<td>367,116</td>
<td>105,083</td>
<td>49,943</td>
<td>159,536</td>
<td>264,619</td>
</tr>
<tr>
<td>1882</td>
<td>411,090</td>
<td>111,029</td>
<td>53,382</td>
<td>258,221</td>
<td>369,250</td>
</tr>
<tr>
<td>1883</td>
<td>406,016</td>
<td>223,050</td>
<td>56,822</td>
<td>356,906</td>
<td>579,956</td>
</tr>
<tr>
<td>1884</td>
<td>634,306</td>
<td>247,529</td>
<td>131,385</td>
<td>407,594</td>
<td>655,123</td>
</tr>
<tr>
<td>1885</td>
<td>606,510</td>
<td>240,234</td>
<td>167,970</td>
<td>436,345</td>
<td>676,579</td>
</tr>
<tr>
<td>1886</td>
<td>569,421</td>
<td>224,815</td>
<td>148,002</td>
<td>482,003</td>
<td>706,818</td>
</tr>
<tr>
<td>1887</td>
<td>621,295</td>
<td>239,812</td>
<td>174,194</td>
<td>570,033</td>
<td>809,845</td>
</tr>
<tr>
<td>1888</td>
<td>673,169</td>
<td>254,810</td>
<td>200,386</td>
<td>658,063</td>
<td>912,873</td>
</tr>
<tr>
<td>1889</td>
<td>596,812</td>
<td>271,563</td>
<td>190,903</td>
<td>710,849</td>
<td>982,412</td>
</tr>
<tr>
<td>1890</td>
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<td>383,107</td>
<td>288,836</td>
<td>1,153,999</td>
<td>1,537,106</td>
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<td>1891</td>
<td>795,625</td>
<td>456,686</td>
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<td>1,176,562</td>
<td>1,633,248</td>
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<tr>
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</tr>
<tr>
<td>1899</td>
<td>---</td>
<td>739,374</td>
<td>---</td>
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<td>750,127</td>
<td>767,796</td>
<td>3,875,121</td>
<td>4,625,248</td>
</tr>
<tr>
<td>1903</td>
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<td>1904-07</td>
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<td></td>
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</tr>
<tr>
<td>1908</td>
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<td>1,208,994</td>
<td>1,002,601</td>
<td>6,186,929</td>
<td>7,395,923</td>
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<tr>
<td>1909-11</td>
<td>No statistics available for these years</td>
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</tr>
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</table>

Sources: as for Table I
Table VII  Dividends paid on selected shares and debentures of the Interoceanic Railroad (1892-1910)

<table>
<thead>
<tr>
<th>Year</th>
<th>5% (10) First Pref. (%)</th>
<th>4% (10) Second Pref. (issued 1896) (%)</th>
<th>7% (10) cumulative preference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1892</td>
<td>Nil</td>
<td>-</td>
<td>Nil</td>
</tr>
<tr>
<td>1893</td>
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<tr>
<td>1894</td>
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<td>-</td>
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</tr>
<tr>
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<td>&quot;</td>
<td>-</td>
<td>&quot;</td>
</tr>
<tr>
<td>1896</td>
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<td>Nil</td>
<td>&quot;</td>
</tr>
<tr>
<td>1897</td>
<td>&quot;</td>
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<td>&quot;</td>
</tr>
<tr>
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<td>&quot;</td>
</tr>
<tr>
<td>1899</td>
<td>&quot;</td>
<td>&quot;</td>
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</tr>
<tr>
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<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
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<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>1902</td>
<td>&quot;</td>
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</tr>
<tr>
<td>1903</td>
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<td>&quot;</td>
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</tr>
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<td>&quot;</td>
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<td>(?) *</td>
</tr>
<tr>
<td>1910</td>
<td>5</td>
<td>4</td>
<td>(?) *</td>
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</table>

*Figures not available

<table>
<thead>
<tr>
<th>Year</th>
<th>7% &quot;B&quot; debentures (10) (%)</th>
<th>4½% 2nd debentures (10) issued end of 1910 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1892</td>
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<td>-</td>
</tr>
<tr>
<td>1893</td>
<td>&quot;</td>
<td>-</td>
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<tr>
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<tr>
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<td>1901</td>
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</tr>
<tr>
<td>1908</td>
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<td>1909</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>1910</td>
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</table>

Source: Tischendorf, op. cit., p. 59
PASSENGER AND FREIGHT TRAFFIC OF F.C. MEXICANO
PASSENGER, FREIGHT AND TOTAL RECEIPTS OF F.C. CENTRAL.
PASSENGER, FREIGHT, AND TOTAL RECEIPTS OF FC NACIONAL
Pasenger and Freight traffic of CA Internacional
PASSENGER, FREIGHT AND TOTAL RECEIPTS OF FC INTERNACIONAL.
PASSENGER, FREIGHT AND TOTAL RECEIPTS OF F.C. INTEROCEANICO
Map of the F. C. Mexicano

Map of the F. C. Interoceánico
Map of the F. C. Central.
Map of the F. C. Nacional.
Map of the F. C. Internacional.