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The Construction of the Central Railway of Peru as Reflected in the 1870-1875 Company Letters

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THE CONSTRUCTION OF THE CENTRAL RAILWAY OF PERU
AS REFLECTED IN THE 1870-1875
COMPANY LETTERS

by
Ann Sanford Caraher

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of
the Requirements for the Degree of
Master of Arts

June

1966

FOR MOM, DAD, LEILA
AND PAUL
WITH LOVE, THANKS, GRATITUDE
AND HONOR

LIFE

Ann Sanford Caraher, born in Evanston, Illinois, September 15, 1936, was graduated from Our Lady of Good Counsel Academy, Dallas, Texas, May, 1954, and from Mundelein College, Chicago, June, 1959, with the degree of Bachelor of Arts. Also she attended the University of Fribourg, Fribourg, Switzerland during the school year, 1956-1957, with Rosary College (River Forest, Illinois) Junior Year Abroad.

From February to June, 1959, she taught fourth grade at Saint Mary's Parochial School, Evanston, Illinois, and the next year taught sixth grade there. During the spring and summer of 1959, she took courses in English at Loyola University, Chicago. She began her graduate studies there in the field of history, with emphasis on the Latin American area, in June, 1960, and augmented them with a summer (June 25 to August 5, 1961) of study at the Pontifical Catholic University of Peru in Lima. In June, 1962, after the death of her mother, she returned to her graduate studies at Loyola University. At this time she applied for a grant for further research in Peru.

During the summer of 1962, she became familiar with her thesis topic through books and periodicals available in the Chicago area. The next year she received an Organization of American States grant to continue her research in Peru (July, 1963, through February, 1964).

Upon her return to the United States in March, 1964, she completed examinations at Loyola University. During the academic year, 1964-1965, she taught United States history and English literature at Regina Dominican High School, Wilmette, Illinois. In August, 1965, she married Paul F. Caraher.

PREFACE

In 1870 Peru was at the height of railway fever. That year three hitherto lacking elements for railroad development, funds, demand, and opportunity, came to fruition. The guano deposits supplied the funds, simultaneous railroad construction in the United States, Europe, and Chile provided the demand, and the appearance of Henry Meiggs furnished an opportunity. The purpose of this study is to penetrate the railway fever of Peru, focusing on the story of the construction of her transandine railroad, the Central Railway, as reflected in the 1870-1875 company letters which are usually referred to as the "Meiggs Papers."

A superficial review of the physical, social, political, and economic geography of Peru will be given in order to more fully appreciate the necessity and magnificence of the Central Railway. It will be noted that the study is primarily dependent on English sources because the Meiggs Papers, the original documents on which this study is based, were ninety-five per cent English. Many other contemporary sources, both Spanish and English, were consulted. However, these dealt mainly with the guano question, the financial difficulties of the Peruvian government, and the Meiggs organization as a whole. The present study concerns only the story of the construction of the Central Railway as reflected in the 1870-1875 Meiggs Papers.

The Meiggs Papers consist of approximately fifteen letter-books, fifteen cash books, bundles of canceled checks, bundles of papers, plans, testimonials, contracts, letters, and various other business papers of the Meiggs company in Peru. The letter-books are bound, numbered, tissue sheets ranging from five hundred to seven hundred fifty pages each, with a total of approximately seven thousand pages on which hectograph copies of the original

letters issued from the home-office at Lima were transferred.¹ They include letters sent within the company itself, and others to foreign agents, to persons requesting employment, to the relatives of the workers, and to others. The fifteen letter bundles, measuring in bulk, approximately fifty inches, contain original letters to the Lima office, some from within the company, some from within Peru, and many from outside the country. In some cases it was possible to pair the incoming letters with the outgoing replies.

A good number of the original letters bear notes of Henry Meiggs or his brother, John G. Meiggs, indicating in what manner a reply was to be written. These replies were written by James H. Sherman, William M. Bush, Charles Rand, and John A. Horn and possibly others who were clerks, accountants and secretaries in the Lima office. Evidently the destination and type of letter determined into which book it was transferred. There was no specific organization other than chronology. Many of the books contained pages for an alphabetical index before the numbered tissue sheets, but these were not always used. Those that were, gave only the pages on which copies to that party could be found. The filing of the incoming letters seemed to be no better. After having been answered and marked as such, they were folded without their envelopes to approximately nine by four inches and identified as to writer and date, and stacked in piles with other letters received the same year from others whose last names began with the same initial. There seemed to be no distinction made between letters from company employees, foreign and domestic agents, relatives and friends, or persons requesting employment and financial help.

The Meiggs Papers owe their preservation to the foresight of Carlos Horsfall Watson, a member of the Chilean commercial house of Watson and

¹A letter written with a carbonized (?) ink was placed under a dampened sheet of the letter-book. A light pressure was then applied and a minute amount of the ink was thus transferred to the underside of the tissue sheet. The transfer, read from the upperside, was a duplication of the original letter.

Meiggs² in Valparaiso. He later became general superintendent of the company when John G. Meiggs, departing from Peru in December, 1875, vacated the position. Subsequently Watson became president of the directorate set-up to finish the railroad contracts at the death of Meiggs. It is presumed that at this time Watson ordered the collection and preservation of the Meiggs business papers because the papers are also referred to as the "Archivo Don Carlos Watson." Unfortunately there is a paucity of letter-books. Many of them, no doubt, were lost or destroyed during the subsequent history of the Meiggs company and of Peru—the financial collapse, the War of the Pacific, and the occupation by Chile. In 1890 the Peruvian Corporation, an English, later, Canadian, enterprise organized to bail out European bondholders and salvage the wreck of Peruvian finances, took over most of the railroads of the nation. The Peruvian Corporation presently possess the Meiggs Papers.

Appreciation is due the many who have aided me in this study. I am deeply grateful to Dr. Paul S. Lietz who introduced me to South American history in the fall of 1960; to Reverend Francis X. Grollig, S.J., Ph.D. who introduced me to Peru as a participant in the 1961 Loyola University Summer Study Program in Lima, in conjunction with the Pontifical Catholic University of Peru; and to Dr. Paul Kiniery who introduced me to historical research.

The topic was undertaken at the suggestion of Dr. Lietz, begun in his seminar in the summer of 1962, and completed under his valuable direction. Application was made, at the suggestion of Father Grollig, for a grant to do research in Peru. One was subsequently obtained through the generosity of Javier Malagon, Technical Secretary of the Program of Grants and Fellowships of the Organization of American States, which enabled my return to Peru in July, 1963.

In Peru the Meiggs Papers were put at my disposal by the Peruvian Corporation in Lima through the kindness of Mr. Charles Crofton-Atkins, then (1963) General Manager of the Central Railway, and the Assistant Traffic

²The "Meiggs" of Watson and Meiggs was a son of Henry. Watson and Meiggs functioned as Henry's Chilean agent during a great part of the period of his operations in Peru.

Manager, Mr. Haydn Jenkins. These gentlemen were most generous in providing me with facilities for using the papers.

Dr. Alberto Varillas of the Pontifical Catholic University of Peru gave me much encouragement and direction as did Dr. Jorge Basadre, a foremost historian of Peru.

In addition thanks are due LaRae Dudley, Margaret Matesich, Tula Comena, Rita Flores, Eusebia Ruiz, and my other Peruvian companions who through their warm hospitality and sympathetic friendship, greatly aided me during the months of my research.

Gratitude is due Mr. Watt Stewart and Mr. Brian Fawcett who gave me invaluable assistance through their published works and also through personal correspondence.

This study owes much to the encouragement, enthusiasm, and inspiration of many unnamed but not forgotten benefactors in Peru, in England, and in the United States.

I am indebted to Mrs. Palmer Anderson, friend and teacher, for her kindness in reading and criticizing a draft of the entire manuscript.

Finally, I thank my husband, Paul, who sustained me during the final composition by his enthusiastic encouragement, wise guidance, and enduring patience.

Ann Sanford Caraher

Easter, 1966

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THE MEIGGS PAPERS*

The following scheme indicates the Meiggs Papers letter books used in this study. The books which are similar are grouped together, and all are arranged chronologically. The numbers of the letter books are those which were marked on the binding. The books whose binding was damaged were identified by comparison with the books quoted by Watt Stewart in his biography of Meiggs. I also gave two books in Group C letters to differentiate them from similarly numbered books in Group A. Since two other Group C books were unnumbered, I referred to them as "Green" (from its green felt binding) and "Blur" (from its blurred markings).

GROUP A

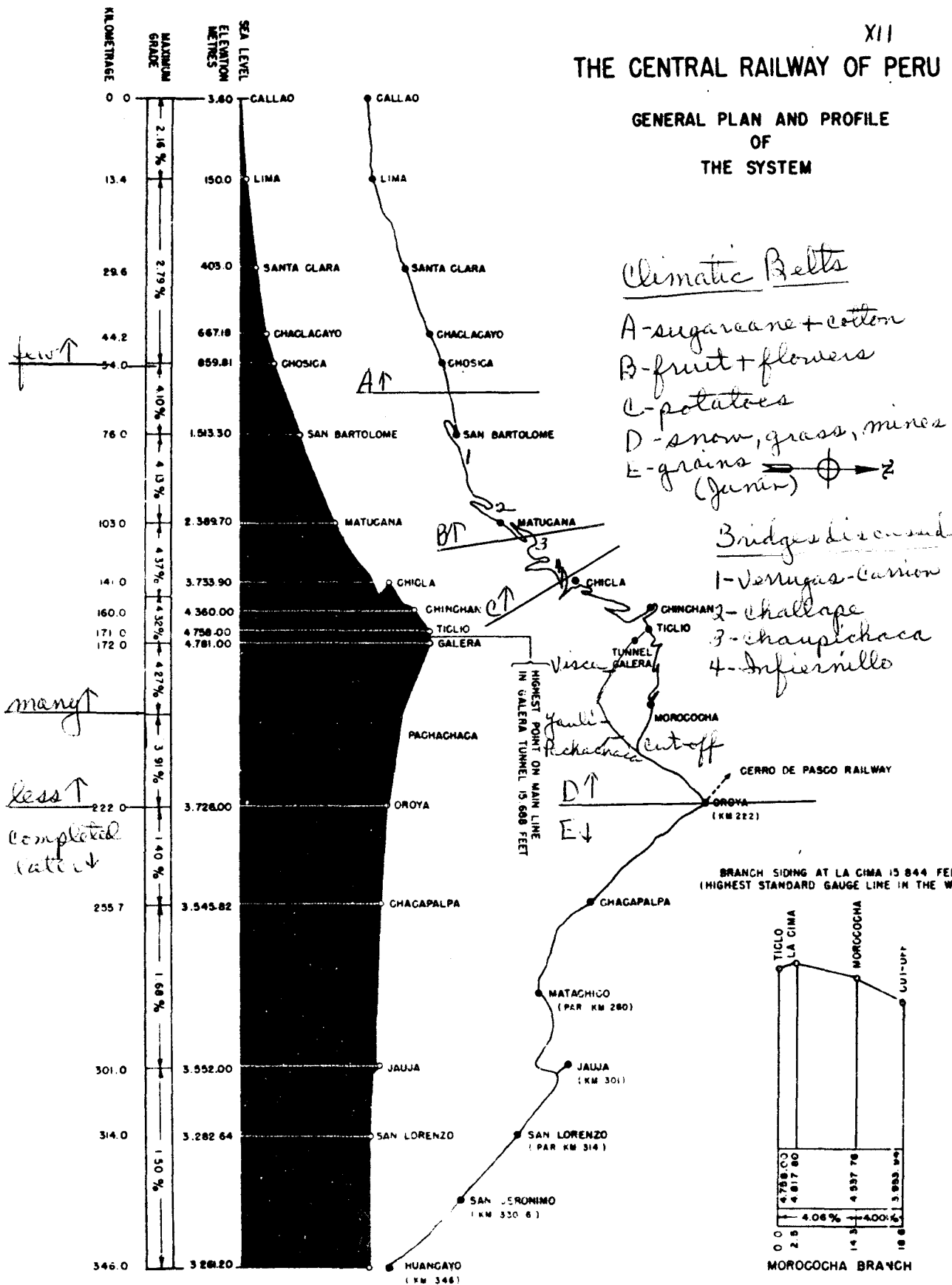
MP 1:	January 11, 1870 to October 24, 1870	(594pp.)	Lima Office:	Letters
MP 5:	October 27, 1871 to March 6, 1872	(690pp.)	Lima Office:	Letters
MP 8:	October 30, 1872 to April 24, 1873	(750pp.)	Lima Office:	Letters
MP 9:	April 24, 1873 to November 21, 1873	(750pp.)	Lima Office:	Letters
MP 10:	November 24, 1873 to June 15, 1874	(500pp.)	Lima Office:	Letters
MP 11:	June 17, 1874 to January 18, 1876	(752pp.)	Lima Office:	Letters

* Among the Meiggs Papers were several cash books, many bundles of canceled checks, bundles of papers—plans, testimonials, and the like. There were also six other letter books for various years between 1875 and 1886 and another two books for a few of the years in the nineties. None of these later books are quoted in this study.

MP "b"	1870 - T 1871 - A to Z 1873 - N, O, P	(7")	(1870 - T)
MP "c"	1871 - bills 1877 - cash receipts	(2")	(Private to Henry Meiggs 1871 - July to December)
MP "d"	1871 - F	(1")	
MP "e"	1871 - N, O	(3")	
MP "f"	1871 - W, X, Y, Z	(3 $\frac{1}{2}$ ")	
MP "n"	1871 - sundry Watson & Meiggs 10 Chinese contracts	(2 $\frac{1}{2}$ ")	(1871 - Especiales de Costa y Laurent - No. 3)
MP "g"	1871 - sundry 1872 - sundry 1873 - sundry 1875 - sundry	(3")	(1872 - Oroya Road et al)
MP "h"	1872 - D, E, F, G	(5")	
MP "k"	(1872 - M)	(1 $\frac{1}{2}$ ")	
MP "i"	1873 - R, S, T 1877 - R, S, T	(2 $\frac{1}{2}$ ")	(1873 - R, S, T)
MP "j"	1874 - S to Z	(3")	
MP "l"	(unidentified contracts #2-10)	(1")	

THE CENTRAL RAILWAY OF PERU

GENERAL PLAN AND PROFILE OF THE SYSTEM



few ↑

many ↑

less ↑

completed later ↓

HIGHEST POINT ON MAIN LINE IN VALERA TUNNEL IS 608 FEET

BRANCH SIDING AT LA GIMA IS 844 FEET (HIGHEST STANDARD GAUGE LINE IN THE WORLD)

CHAPTER I

RAILWAY FEVER

A superficial knowledge of the physical, social, political, and economic geography of Peru is sufficient to appreciate the necessity and magnificence of the Central Railway. The towering, rugged mass of the Andes run the length of the country, dividing it into essentially three regions, creating serious transportation problems and preventing the development of agriculture and trade. The three regions are the coastal area, the high mountains and plateaus, and the eastern lowlands. In reality, however, each of these broad regions is composed of various subregions, so that the three-divisional scheme is a gross oversimplification.

The arid coastal region stretches along the Pacific. Within its narrow confines are sandy plains, green plantations, and brown, barren foothills. Although the region is in the tropical zone, its climate is tempered by the Peru Current. Westerly winds blowing across this cold ocean current become cool and reduce the heat of the coast. Their moisture, absorbed in the warmer air over the land, produces no rain, but causes heavy mists and fogs, which hang over the coast like an umbrella for several months of the year. Nevertheless, cotton and sugar cane flourish in rare oases, watered by irrigation and the few streams fed by the melting snows and the rains of the mountains.

On the eastern side of Peru is found the "high" jungle of dense forests of valuable hardwoods, and the "low" jungle of various fruits and vegetables. The climate, in the degree of descent ranges from semitropical to tropical. These lowlands are largely undeveloped, very sparsely populated, and only partially explored.

Between her east and west borders, the topography of Peru is, of course, extremely irregular, due to the Andes whose two major ranges, the Cordillera Occidental and the Cordillera Oriental, run in a northwest-southeast direction. However, there are many ranges which depart from the normal trend to cross diagonally from southwest to northeast. These various ramifications of the two major ranges make the inter-range lands a confusion of mountain and plateau, inclosing numerous basins wherein have developed most of the towns of the sierra. Large areas have a surface of gentle relief, highly favorable to agriculture. The kinds of crops which are produced, corn, wheat, potatoes, and other vegetables, are determined by altitude. The westernmost rim of the cordillera which overlooks the Pacific coast forms the Continental Divide. It is from this great western range that most of the mineral wealth has come.¹

Despite the factors of geography, Peru possesses incalculable wealth in natural resources. The rugged nature of the terrain has been a constant handicap to mechanization and transportation, retarding the development of these immense resources. Development, a dream with amazing possibilities, was waiting for capital, a greater labor supply, and better means of transportation.²

One of Peru's natural resources, the mining industry, had been arrested and had fallen into disuse during the wars of independence and the following years. Little had been done to remedy this situation, and others like it, because of the disorganized governments, the unsettled social conditions, and the corresponding poverty of the people. Sufficient knowledge,

¹For more details of the varied geography of Peru see Preston E. James, Latin America (rev. ed.; New York: The Odyssey Press, 1950), pp. 126-171 and Clarence F. Jones, South America (New York: Henry Holt & Company, 1930), pp. 168-223.

²Louis Clinton Nolan, "The Diplomatic and Commercial Relations of the United States and Peru" (unpublished Ph.D. dissertation, Duke University, 1935), p. 8.

enterprise, and capital were needed.³ Whereas private individuals, Peruvians and foreigners, could supply the first two, European financial houses were wary of supplying the last. In Peru security was uncertain, political tranquillity had not begun to exist, nor, unfortunately, had ministerial integrity.⁴

The social geography of Peru is almost as divided and difficult as its physical. Although the population has grown in total numbers, the divisions remain constant. About half or more are Indians, a third or more are a mixture of Indian and white, "mestizos,"⁵ and perhaps a tenth are white.

A small Negro element, mainly laborers and servants,⁶ and Chinese, imported between 1849 and 1874 for their cheap labor,⁷ intermingled with the coastal population. European immigration has been scanty as few immigrants cared to go to the sierras or the lowlands where they would have had to compete with the primitive living standards of the Indians.⁸ Even though

³Nolan, pp. 16-17.

⁴Brian Fawcett, Railways of the Andes (London: George Allen and Unwin, Ltd., 1963), p. 15.

⁵For a discussion of the "mestizos" from the point of view of cultural anthropology, with emphasis upon the mode of life, the patterns of custom, and their adaptation to the natural environment and to the cultural conditions of the cosmopolitan world, see John Gillin, "Mestizo America," Most of the World, ed. Ralph Linton (New York: Columbia University Press, 1949), pp. 156-211.

⁶For references to the Negro in Peru see James Ferguson King, "Negro History in Continental Spanish America," The Journal of Negro History XXIX (January, 1944), pp. 7-23; Fernando Romero, "The Slave Trade and the Negro in South America," Hispanic American Historical Review, XXIV (August, 1944), pp. 368-86; Wilbur Zelinsky, "The Historical Geography of the Negro Population of Latin America," The Journal of Negro History, XXXIV (April, 1949), pp. 153-221.

⁷For the history of the Chinese coolie in Peru during this period see Watt Stewart, Chinese Bondage in Peru (Durham, N.C.: Duke University Press, 1951).

⁸⁸Frank Tannenbaum, Whither Latin America? (New York: Crowell Co., 1934), pp. 13-16.

isolated by the poor communications, they would have been almost independent of the Peruvian authority.⁹ Since foreign interests, American, British, and others, have been attracted by Peru's unexploited natural resources, their people form a portion of her population.

Being the meeting place and battleground of Creole ideals and Spanish ideas, Peru's political transition from a colonial society to a modern state was a long and perilous one. Her early years were a succession of dictatorships made inevitable by the complete lack of political consciousness of the masses and the tradition of autocratic government of the ruling minority. In addition, the mountain regions and the eastern lowlands have been so isolated from one another and from the coast that the people have clung to their local leaders instead of growing into a closely united nation. These factors among others account for the great amount of personalism and personalities rather than parties that ruled politics in the Nineteenth Century.¹⁰

The personalities were found in the "caudillos," strong military leaders of the battles for independence. The best of them aided progress by keeping peace and order and by encouraging trade and agriculture. The worst of them involved the country in bloody wars, civil and foreign, and squandered the nation's men, wealth, and power. The caudillos' great numbers, the exaggerated esteem with which they were regarded, and their constant readiness to test everything by an appeal to arms, explain why they were able to hold power for almost half a century. These militantly ambitious soldiers desired to use political office to gain personal wealth in the few years before others, more ambitious than they, might revolt successfully and gain office. This succession of power-hungry generals, their endless plotting and counter-plotting, and the brief intervals of peace while warring

⁹Watt Stewart, Henry Meiggs, Yankee Pizarro (Durham, N.C.: Duke University Press, 1946), p. 71.

¹⁰Nolan, pp. 21-22.

forces regrouped, plus many foreign disturbances, gave Peru a calamitous beginning as a self-governing nation and damaged the hesitantly developing economy.¹¹

In the middle of the Nineteenth Century the economy of Peru, and subsequently her security, had been given impetus by the exploitation of the rediscovered guano deposits, the droppings of sea-birds rich in fertilizing mineral. For unreckoned centuries millions of pelicans, cormorants, and gannets had been feeding from the abundant fish of the coastal waters and dropping their excrement upon the uninhabited offshore islands. Undisturbed by rain, this bird dung had accumulated in vast mounds. Long before the arrival of the Spaniards, the Indians had collected the manure, carrying it on their backs to the terraces cut into the high mountains. Obsessed by the quick profit from silver mines, the Spaniards paid no attention to guano nor did the Peruvians in the first turbulent years of the republic. Not until the early 1840's when it was learned that this bird manure was rich in nitrogen did the Peruvian government, with uncontested control over the islands, declare the guano industry a national monopoly.¹²

¹¹ A traditional and superficial view of Nineteenth Century Peru. For a fuller view of the "caudillos" see R. J. Owen, Peru (London: Oxford University Press, 1963), pp. 39-41; Charles E. Chapman, "The Age of the Caudillos: A Chapter in Hispanic American History," Hispanic American Historical Review, XII (August, 1932), pp. 281-300; R. A. Fumhpreys, "Latin America. The Caudillo Tradition," Soldiers and Governments. Nine Studies in Civil-Military Relations, ed. Michael Howard (Bloomington: Indiana University Press, 1959), pp. 151-165.

¹² See William Jefferson Dennis, Tacna and Arica. An Account of the Chile-Peru Boundary Dispute and of the Arbitrations by the United States (New Haven: Yale University Press, 1931), pp. 26-83 for a summary of the diplomatic effects of the exportation of guano and the role guano had in the subsequent War of the Pacific. Also see R. E. Coker, "Peru's Wealth Producing Birds," The National Geographic Magazine, XXXVII (June, 1920), pp. 537-66 for an illustrated account of the guano birds.

At first the guano was exported on a commission basis, but in 1847 this trade shifted to consignment, that is, to government retention of title until the final sale. During the greater part of the Nineteenth Century, consignment sale was the normal method of conducting international trade since slow transport and communications made any knowledge of sales conditions in distant markets highly uncertain. The Peruvian government thought that in this manner it could enjoy advantages of both risk-taking profits and monopolistic prices. Therefore, it awarded consignment contracts to exclusive country sales agents upon the consignee's payment of large interest-bearing cash advances. The consignee would arrange for loading, ship charter, storage, and final sale, in return for a two or three per cent commission on costs and a further commission on gross sales proceeds. It was agreed that the consignee promote the government's interest, yet the terms of the contract made it more profitable for him to oppose it, and in many cases he did. In the twenty years that consignment was followed, there was increasing public resentment toward the system. The government could do nothing to stop the abuses as there were expanding financial needs dependent upon the consignees' advances. Therefore the government profited little from the business though the gains of the consignees—Peruvians by preference—were often great.¹³

The years between 1861 and 1875 saw the maximum development of the guano trade. However, so large a part of the income from this source was swallowed by the interest of the constantly mounting public debt and by the various financial manipulations that characterized the complicated relations between the government and the consignees that the public treasury was chronically depleted. Deficits actually began to appear after 1861. Heavy expenditures, both of an ordinary and an emergency nature, were the rule,

¹³ Stewart, p. 266; Jonathan V. Levin, The Export Economies, Their Pattern of Development in Historical Perspective (Cambridge, Mass.: Harvard University Press, 1960), pp. 65-73. Part I of this work gives a well documented account of guano as an export economy.

while sources of income other than guano were neglected. The critical condition from 1864 to 1868 was aggravated by a state of war with Spain and by internal disturbances. The accumulated deficit mounted and the net income from guano sales was practically absorbed by the debt charges.

At this time dissatisfaction with the consignment policies became so acute that they were discontinued and a commission was sent to Europe to make more satisfactory arrangements. By "satisfactory arrangements" was meant a contract whose proceeds would satisfy the interest of the foreign debt (all based on a pledge of the guano revenue) and at the same time guarantee a free portion for the pressing needs of the home administration. The negotiations of 1868 and 1869 resulted in the making of a contract with the firm of Dreyfus Brothers and Company of Paris, which was approved in 1869 by the Peruvian Congress. By the contract the Dreyfus Brothers obtained a monopoly of the sale of guano in all parts of the world except North America and were appointed fiscal agents of the Peruvian government abroad, in return for assuming the interest of previous loans, the settlement of the outstanding accounts with the consignees who had made advances to the government. In addition, the Dreyfus Brothers were to make a regular monthly payment of 700,000 soles¹⁴ to the government for its current needs.¹⁵ Had this contract been carried out without complications which were later encountered, it is possible that Peru would have regained financial stability. However, the contract's advantages were nullified by later developments which plunged Peru into an overburdening debt.¹⁶

¹⁴The Peruvian "sol" which consists of one hundred "centavos," or ten "reales," was worth between 1862 and 1875 slightly less than the American dollar and about one-fifth of the English pound sterling. See Stewart, p. 69 and McQueen (below, note 16), p. 94.

¹⁵See Stewart, pp. 266-268 and Levin, pp. 98-99 for a fuller description of the 1869 Dreyfus Brothers contract.

¹⁶Charles A. McQueen, Peruvian Public Finance, U.S. Dept. of Commerce Trade Promotion Series No. 30 (Washington: U.S. Government Printing Office, 1926), pp. 6-7.

In 1868 Peru was an adolescent nation with her national resources still largely untapped and her liberty loving people just emerging from a state of almost chronic political turmoil. President Balta, then assuming office, desired to find some way of eliminating internal strife and of developing the industries of the country. He thus embarked the country on a gigantic plan of public works which almost exclusively meant railroad construction. The building of railroads not only would give occupation to many people and stimulate general business, but would furnish the communication much needed to encourage the development of agriculture and mining.¹⁷

It was believed that adequate transportation to the interior, for instance to the Central Peruvian Department of Junin over the ramparts of the Andes east of Lima, would build the economy. The Department of Junin contained diverse elements of prosperity: mineral-wealthy mountain ranges to the north, tropically lush lowlands to the east, and agriculturally rich plateaus and valleys to the south. Manuel Pardo, an economist and later President of Peru, in his "Studies Concerning the Province of Jauja"¹⁸ advanced arguments for railroad transportation from the capital to the interior which were the embodiment of practically all railroad-building discussions during the third quarter of the Nineteenth Century. Pardo stated as an example that the agriculturally rich valleys produced cereals of excellent quality and could produce enough to supply much of the country if the transportation necessary for shipment of the excess produce were available. Railroads to the interior would also have moral results in giving mobility and material betterment to the Indians by increasing their civilization through contact with the outside world. Pardo believed that such contact, a prime requisite in the promotion of mining, agriculture, and trade, also would aid in the colonization of the lowland zone near Junin.¹⁹

¹⁷McQueen, p. 7; Nolan, p. 48.

¹⁸Estudios sobre la Provincia de Jauja (Lima, 1862), 65pp. The author was President of Peru in the years 1872-1876.

¹⁹Manuel Pardo as quoted in Stewart, pp. 69-75.

The material wealth embodied in the guano exportation, although heavily pledged to the payment of past indebtedness without contemplation of the possibility of exhaustion of deposits and without consideration of conservation of the birds, was thought ample to build the greatly desired public works. Actually in control of a plutocracy, the theoretically constitutional and republican government had as its primary aim the acquisition of more wealth. The plutocracy had few scruples as to the method of acquisition and saw the opportunity in rich public works contracts. Many people with integrity believed seriously that the construction of railroads would bring well-being to the masses and would militate against continuous overturns in government.²⁰ They thought that a railroad to the interior would have political and hygienic results also. Being in the center of Peru, the Department of Junin had a strategic value with regard to the national structure and the mobilization of the armies. Junin also had much manpower for the armies and adequate produce to feed them. Hygienically the area had a climate favorable to those recuperating from consumption and dysentery.²¹

There had been roads since the time of the Incas, who had surprisingly good ones, despite their narrowness, having been built for Indian runners and transportation of freight by llamas. With her growing commerce and population, her rich mineral deposits and agricultural advantages, her national vanity and the requirements for progress, Peru demanded something to supersede the mule and llama in the development of her vast resources, which must otherwise lie dormant within the iron embrace of the Andean chain. It was reasoned that with her unique geographical situation it would cost little more to widen the ancient foot-tracks of the Incas for the modern iron tracks of the railroads, than to widen them for horses, carts, and wagons. Besides, her neighbor and sometimes rival, Chile, had railroads. Short profitable lines had already been built within the environs of Lima.²² So

²⁰ Stewart, pp. 78-79. ²¹ Manuel Pardo as quoted in Stewart, p. 74.

²² In the 1850's a nine mile railroad was built from Callao to Lima which was later extended another eight miles to Chorrillos, a suburb of Lima. See below, Chapter IV.

why not succumb, it was argued, to the railway fever that was already prevalent in many other countries. Previously, railroad development, though required, had lacked funds, demand, and opportunity. Presently the guano exportation supplied the funds, simultaneous railroad construction in the United States, Europe, and Chile, among other reasons, provided the demand, and in 1868 came the opportunity.²³

The idea of a railroad which would unite the coast and Lima with the Department of Junin had been seriously discussed for almost twenty years and by 1868 the route of the railroad already had been decided and surveyed. This route followed the precipitous Rimac River canyon from the Pacific directly into and over the central range of the Andes and down twenty-five miles to Oroya, squeezed into the basin of the Mantaro River. Oroya, at twelve thousand feet above the sea, was recognized as an important location for the continuation of lines in three directions: northward eighty miles following the Mantaro through a series of intermontane basins to its source and the mining district of Cerro de Pasco (15,000 feet); eastward thirty miles into the semitropical agricultural region about Tarma, on the edge of the eastern lowlands; and southward eighty miles following the Mantaro downstream to Huancayo, situated in a large basin some forty miles long by ten wide at about eleven thousand feet above sea level. Two other river canyons had been considered as possible routes to the interior: the Chancay, flowing into the Pacific about thirty miles north of Lima; and the Lurin, about twenty miles south. The Chancay route would bring the important mining district of Cerro de Pasco nearer the coast but would necessitate sacrificing the other rich districts to the south. The southern route, following the valley of the Lurin, would terminate at Oroya but would necessitate the construction of the railroad on the very peak of the central Andean range.²⁴

²³ Fawcett, p. 23; Nolan, p. 45; J. T. Meagher, "A Railroad Above the Clouds," The Lakeside Monthly, VII (April, 1872), p. 274.

²⁴ Ernesto Malinowski as quoted in Thomas J. Hutchinson, Two Years in Peru with Exploration of Its Antiquities II (London: Low, Marston, Low & Searle, 1873), pp. 76-78.

Preliminary studies had been made of the various routes during the early years of the railway fever. Possibly these had been done hastily without adequate knowledge of the terrain involved. It was a common dream to connect the capital with the interior. Most Peruvians acknowledged the importance of the geographical position of Oroya. The physical characteristics of any part of Peru were alien to the construction of a railroad. All three possible routes had disadvantages. Perhaps a compromise was reached by the selection of the middle route—the Rimac canyon—which was also the most direct and feasible for uniting the interior with the capital and its seaport. Many years later, some claimed that the Rimac canyon route was chosen primarily because of its difficulty, thereby involving more profit for the contractor and his abettors.²⁵ However, there was no assurance in 1868 that had another route been selected there would have been ministerial integrity.

Although the Oroya Railroad had been conceived and the route it was to follow had actually been surveyed, it nevertheless was a formidable project requiring genius and enterprise. An individual with imagination, daring, and energy was needed to execute so bold a venture. There was such a man in Chile, a Yankee, Henry Meiggs, born in Catskill, New York, in 1811. He had made and lost fortunes in New York and California before moving to Chile²⁶ where, with no assets other than a remarkable personality, he had soon built up another fortune and a reputation as a railroad builder.²⁷

The Peruvian government, having experienced failure with previous railroad contractors, invited Meiggs to Peru. Shortly after his arrival with a skeleton organization in late January, 1868, he was awarded a contract to

²⁵See Stewart, pp. 269-270 for criticism and Fawcett, p. 214 for approval of the Rimac canyon route.

²⁶See Stewart, pp. 3-41 for Meiggs's life before 1868.

²⁷Charles R. Flint, Memories of an Active Life (New York: G. P. Putnam's Sons, 1923), p. 53.

build a line in southern Peru, from the coast to Arequipa, slightly more than one hundred miles inland. At the end of May, less than a month after the validation of the contract, work began.²⁸ Under the best of conditions the current revenue from the guano contract with Dreyfus Brothers would not have sufficed for carrying out Balta's ambitious plan of public works. But one of the results of the loan was the immediate betterment of Peruvian national credit which unfortunately inspired Peru with a spirit of optimism leading to exaggerated borrowing. On January 15, 1869, Congress passed a law authorizing the construction of railways deemed necessary and the emission of bonds with which to pay for them. Thus Peru began negotiating for a second loan before the ink was scarcely dry on the first and Meiggs negotiated for more railroad contracts. Simultaneously he petitioned the government and was authorized to make preliminary surveys, and in December, 1869, won the contracts for the construction of a line from the coast to Oroya and for the continuation of the Arequipa line to Puno.²⁹

As stated in the contract, the Oroya (presently called the Central) Railroad would be constructed according to the plans and outlines approved by the government in virtue of the reports from the engineers. The work would start four months after the contract date and be completed within six years. Materials were to be of the best quality and were to be examined before shipment by government inspectors. They could be introduced free of duty only to the extent that they were required on the work and the government reserved the right to establish such regulations concerning them as might be deemed necessary to prevent smuggling. The contractor was authorized to engage foreign workmen.

The government conceded to the contractor, gratuitously, public lands necessary for the right of way. The acquisition of private citizens' lands would be expedited by the government but paid for by the contractor as would any damages suffered by private persons. Any minerals, fossils, antiquities, and other exploitable things that might be found in the course

²⁸ Stewart, pp. 42-44; 100; 115. ²⁹ Ibid., pp. 86-90; 269-270.

of the work, should be considered property of the state and should be reported immediately to the government. No public traffic could be permitted on the Callao-Lima section of the line until the monopoly of the earlier Callao-Lima Railway came to an end.

The contract provided regulations to be followed in case of alterations or disagreements between the government and the contractor. The latter was to guarantee the works for a period of three years after its completion except for fortuitous damages. A deposit of the contract price should remain in the treasury as a guarantee of the faithful fulfillment of the contract.

The price of the Oroya road was S/27,600,000 payable in bonds in conformity with the law of January 15, 1869. These bonds would draw six per cent interest annually and have a cumulative amortization fund of two per cent beginning ten years after the date of emission. Emission of the bonds should take place in Lima, London, Paris, Frankfort, and New York, and should be deposited within six months after the signing of the contract in a bank or commercial house of Europe or America to the mutual satisfaction of government and contractor. The government would turn over promptly to the contractor bonds in payment for materials procured abroad or in the country as soon as their purchase should be properly certified by government inspectors. To care for these obligations, the government would place in a bank or commercial house of Lima, within forty days, the sum of S/7,000,000 in provisional bills of exchange at six per cent interest payable to the state. These bills could later be exchanged at par for the bonds mentioned in the contract. The remainder of the contractual price would be paid in monthly installments in the proportion which the completed work should bear to the entire project. Each six months there should be, as between government and contractor, a liquidation of the interest on the bonds.³⁰

In June of 1870, the Peruvian government floated in Europe through the Dreyfus Brothers a second loan amounting to L12,000,000 which was quickly

³⁰For a fuller discussion of the contract see Stewart, pp. 91-94.

oversubscribed. To service this loan, however, the government provided that the Dreyfus Brothers should retain 300,000 of the 700,000-sole monthly guano stipend of the loan of 1869, which had previously been allocated to the government's internal expenses. Encouraged by the successful reception afforded its bonds, the government decided upon a new loan to pay for more railroads and some coastal irrigation works. In 1872 a third loan for an additional \$15,000,000 was offered through the Dreyfus house. In contrast to the success of the 1870 issue, however, the public subscription was a complete failure, due probably to the flotation of the large French loan aimed at ending the German occupation after the Franco-Prussian War. To service the 1872 loan, the rest of the original 700,000 soles a month guano stipend was required—the principal support of the ordinary functions of the Peruvian government. The loan of 1870 was applied toward the cost of the railroads from the coast to Oroya and from Arequipa to Puno while that of 1872 was to be used chiefly for the lines to be built in northern Peru. Because of the speed and efficiency with which he was completing the coast-to-Arequipa line, because of the large technical staff and army of laborers he had in operation, and possibly because of other, less honorable, reasons, Meiggs, by the end of 1871, was able to obtain the contracts for the construction of all of these railroads.³¹

Henry Meiggs seems to have had two distinct sides to his character. On one side he was a man who never hesitated to bend circumstances to his own advantage, whatever the effects upon others, and on the other side he was an upright, square-dealing man who honored his agreements to the letter and was so considerate of each of the thousands of people working directly and indirectly under him that he won their sincere affection and unswerving loyalty. Whatever his past record or whatever is said about his shady deals, in his human actions he was a great and benevolent man. This is indicated

³¹Levin, pp. 103-104; McQueen, p. 7; Stewart, pp. 101-102.

by many original letters in the Meiggs Papers and confirmed by first-hand accounts of men who worked very close to Meiggs.³²

The esteem of Meiggs became so widespread that he soon was asked, often by perfect strangers, to join various business activities or to supply details (and money!) for a presentation of his life in biographical collections. Among the proposals received was one asking him to do for Colombia what he had already done for Chile and presently was doing for Peru.

I have resolved to appeal to you, to you who, peacefully, have already achieved two mighty conquests on this continent, to you, who before all others seem destined to wake up "the sleeping giant," to you, who have shown such exceptional aptitude of successfully struggling with exceptional difficulties. Your prestige here is great,³³ your advent in Colombia would, as elsewhere, work miracles.

Another letter written from San Salvador to the superintendent of the Costa Rican railroad for which Meiggs had contracted and turned over to his nephew, Minor C. Keith, to construct, asked the superintendent, William Nanne, to interview "Mr. Meiggs whose very name is a kind of talisman in Railroad matters, and tell me if he would accept a Contract for say 150 miles of railroad and on what general conditions. . . .if Mr. Meiggs would take the Contract no other man or set of men could secure the preference."³⁴ The Colombian letter was marked "Excuse delay & answer—have been in Chile &c—" and the other from San Salvador, "file—no more."

Meiggs also received a letter from the German Charge d'affaires which suggested exportation of Peruvian ores to Germany and thus "give increased activity to German founderies and a secure income to the railway and mining undertakings in Peru."³⁵ Meiggs's fame attained by his "grand

³²Fawcett, pp. 28 + 43; See also Stewart's biography of Meiggs.

³³Robert Wehrhan to Meiggs (Lima), Bogota, April 12, 1871 (MP "f").

³⁴Abstract of a letter from Stanley McNider (San Salvador) included with William Nanne to Meiggs, San Jose, Costa Rica, November 26, 1871 (MP "e").

³⁵Lima, Theadore von Bunsen to Meiggs, December 14, 1871 (MP "f").

railway" to the interior and other enterprises had penetrated Vienna from which came a proposal to enter into railroad building and participation in an American-Austrian Bank.³⁶ It seems unlikely that Meiggs entered into these projects because, no doubt, his time, energy, and finances were already involved with many other miscellaneous business activities.³⁷

The Franklin Publishing Company of New York approached Meiggs, requesting to make his engraved steel portrait for a biographical work they were preparing on American citizens "who prominently illustrate the genius of national character, and the elasticity and beneficence of our institutions." The general agent, Mr. A. C. Rogers, stated that "Yours has been an eventful history, and your life story can certainly be made most attractive reading matter." The cost for the engraving was \$180 for the steel plate and one hundred impressions.³⁸ There is no indication that Meiggs replied to this or a similar one from Switzerland,³⁹ but they demonstrated the wide appeal that Meiggs had—so great, in fact, that he was known "from one end of the west coast of the Americas to the other, simply by his given name 'Don Enrique.'"⁴⁰

Meiggs had brought with him from Chile a few secretaries, draftsmen, engineers, and others. With his talent for picking officers, his "empresa," enterprise, soon included a number of Peruvians and foreigners who believed in him, with the know-how and the flexibility of mind which could match the daring of his projects. These men included his brother, John G. Meiggs, who arrived in Peru about the end of 1869, shortly before

³⁶Bernard Foges to Meiggs, Vienna, August 21, 1872 (MP "h").

³⁷For some of these, see Stewart, pp. 225-241.

³⁸November 20, 1871 (MP "d").

³⁹From Jean Goussier of l'Histoire Generale, Geneve, 1870 (MP "o").

⁴⁰Flint, p. 53.

construction began on the Central Railway. Don Enrique trusted him completely and made him general superintendent of the Peruvian projects.

John G. was Henry's invaluable collaborator and actually ran the undertakings, leaving Henry free to deal with government officials, to make business trips to Chile and Bolivia, to go about the country, and to look after the public relations and the political features of their business. A man of much business sagacity and ability, John G. was equal to his position and like Henry, was a dynamic and impressive figure.⁴¹ His personal correspondence gives a vivid conception of his personality. In one letter, John G. asked a friend to buy at Tiffany and Company "a splendid pair of Diamond Earrings and a Diamond clasp & chain" as his birthday gift for his beloved wife. He enclosed a draft on Joseph S. Spinney for \$5,000 and asked that "if it requires \$1000 or \$2000 more to do the thing right, please do it, and I will remit the difference at once."⁴² In another letter, he asked a second friend to buy him the "very best cigars in New York."⁴³

From all indications the family relations between Henry, John G., and the many other Meiggs relatives were amicable.⁴⁴ This is confirmed in respect to the John G. family by the correspondence during 1870 between John G. and his wife's brother, William Herrick of Oswego, New York. In a January letter, Herrick congratulated John G. upon his success but stated that his pleasure was "greatly dampened by the thought that many long years must elapse before we can even expect to again become a united family." He

⁴¹Stewart, pp. 44; 109-110; 159; Fawcett, pp. 55; 152; Charles A. Wetmore, "Henry Meiggs in Peru," The Overland Monthly, VII (August, 1871), p. 182.

⁴²To Edward A. Jarvis (New York), August 22, 1870 (MP 1, 492-493).

⁴³To L. B. Cornell (New York), March 20, 1870 (MP 1, 84).

⁴⁴See Stewart's biography on Henry Meiggs.

continued to say that he had fallen among difficult times and was "squarely broke" but "full of pluck" and would work things out.⁴⁵

John G. answered that it had done him a "heap of good" to hear from Herrick and that Herrick's financial difficulty was "truly a bitter dose." John G. remarked, however, that he was himself so used to rise and fall that he took things as they came and trusted to the future. He enquired, "Now William tell me frankly if I can be of services to you. I am not rich, but expect to be soon."⁴⁶ Herrick responded,

Your substantial aid is fully appreciated by all—It is a good thing that you are a large man, for no small body could hold that great big heart of yours—It must create happiness, where a man has the ability to carry out the promptings of a generous disposition, and you are of the kind that know how to do it—⁴⁷

In a later letter he accepted the aid, stating that "\$5000 would ease me very much—\$10,000 would remove all danger, and \$15,000 would make me independent."⁴⁸ John G. immediately sent him \$15,000.⁴⁹

The last letter found of William Herrick to John G. expressed his condolences at the death of John G.'s first-born, Carolina:⁵⁰

for me to undertake to convey on paper, an expression of our feelings would be of no use whatever—That we do most deeply sympathise with you in this your hour of deep affliction, you already know—We mourn the loss of a dearly beloved Niece and Cousin, we knew her, and this created love, for she was a "bright

⁴⁵From William H. Herrick (Oswego, New York), January 31, 1870 (MP 6).

⁴⁶To Herrick, March 13, 1870 (MP 1, 75).

⁴⁷From Herrick, April 16, 1870 (MP "o").

⁴⁸From Herrick, July 12, 1870 (MP "o").

⁴⁹To Herrick, August 22, 1870 (MP 1, 490-491).

⁵⁰John G. was the father of six children. The sixth child, a boy, was born at the end of March, 1870, shortly after the family's arrival in Peru. See the letter to J. S. Spinney (New York), March 26, 1870 (MP 1, 100).

particular Star," but alas, she shines no more for us on earth—
 If anything could add to our sorrow, it would be caused by the
 dreadful anguish of Yourself, our dear Sister Mary and you all—
 What a family of mourning you have, but your Daughter is in
 Heaven, and happy—May the great giver of all good, strengthen
 and console you in this great bereavement, is our most earnest
 prayer—We thank you for so kindly sending us extracts from the
 Lima papers. We thank you for everything and may God bless and
 preserve you all until you have fully passed the "Three Score &
 Ten."⁵¹

From these personal letters and the many others written by John G.
 as general superintendent of the Meiggs Empresa, is adequate evidence of the
 powerful and effective figure that he was. Confirmation of his sincerity
 and human understanding are found in the frank letters written in the midst
 of his grief, informing his close friends and business associates of the
 death of his child. These letters are worthy of inclusion because they ex-
 press his innermost feelings during this time of great emotional strain.

To Joseph B. Hill, Mollendo, October 10, 1870

On the 5th our darling Carrie left us for a better world,
 after an illness of twelve days—Our affliction is terrible to
 bear, and I know we should have the heartfelt sympathy of your
 good wife and yourself, as you now know how the dear little ones
 twine themselves about our hearts—She was the first born, and
 was just becoming our companion, as well as our dear child, and
 promised to be a great comfort to us in the future, when the great
 God!! saw fit to add one to His flock and deprive us, and chasten
 us—It is hard to bear indeed, and much harder to believe it to
 be all for the best, but we must say God's will be done!!
 (John G., Lima, MP 1, 577).

To John L. Thorndike, Arequipa, October 10, 1870

Our darling Carrie died on the 5th after an illness of twelve
 days, of typhoid fever. She was not considered seriously ill
 until a few days before her death—You, and your good wife sur-
 rounded as you are by a large and interesting family, will know
 how hard it must be to us to lose our first born, and I feel sure
 of your heartfelt sympathy—To my Wife this sudden bereavement is
 almost death. She is quite ill, but I trust God will spare me and
 all of us from any further affliction. (John G., Lima, MP 1, 583).

⁵¹From Herrick, November 17, 1870 (MP "o").

To Watson and Meiggs, Valparaiso, October 10, 1870

Your letter of the 26th reached me on the 6th whilst in great affliction occasioned by the death of our eldest daughter—She died on the 5th after an illness of twelve days which illness we did not consider serious enough even to speak of in former letters—I know we shall have the heartfelt sympathy of your good selves, and this. . .overpowering bereavement is somewhat softened by the fact that we are surrounded by sympathising friends and relatives. (John G., Lima, MP 1, 588).

From the contents of the other letters in the Meiggs Papers can be deduced the various line bosses and doctors of the work camps, and the domestic and foreign agents. Captain Samuel F. Kissam came from New York to supervise Meiggs's shipping operations at Callao. Another close business associate, Mr. Edmund W. Sartori, was stationed at Callao, probably running a supply depot or warehouse. The foreign agents included the Chilean commercial house of Watson and Meiggs, and Mr. Walton W. Evans of New York who, with his purchasing agent, Mr. Joseph S. Spinney, obtained United States materials for the railroad construction. There were also various purchasing agents and business associates in England, among whom were Mr. John Freundt, Mr. F. M. Schwarz, Mr. James Stahl, and the company of Lockhart and Tozer. Of course, the Dreyfus Brothers of Paris were closely connected with Peru and the Meiggs Empresa during this period of guano, loans, and railroads.

CHAPTER II

THE CENTRAL RAILWAY—THE PHYSICAL SCENE

Few railroads have been built through terrain more stubborn than that traversed by the Central Railway of Peru, in the valley of the Rimac River. The river takes its rise in the mountains whose summit line is slightly less than ninety miles from the sea. Nature has broken the incline by deep depressions and sudden risings, varying the Rimac's fall from two to fifteen per cent,¹ that is, a fall of one foot in fifty to one foot in slightly more than six. This steepness of the western range of the Andes posed serious grade problems since a railroad would have to gain tremendous height within a comparatively short distance. The valleys cutting into the main range of the mountains narrowed very quickly, leaving no room for tracks to turn and twist between the valley walls while gaining height on reasonable grades, while the floors of the valleys, occupied by the Rimac torrent, rose too steeply to permit tracks unless racks were used.²

Racks are sections of notched rails which mesh with gears in specialized engines to pull a train at reduced speed up a grade whose steepness is too great for steam adhesion alone. Of necessity the Rimac route would call for a number of rack sections, which were undesirable because of complexity, expense, and speed limitations. Funiculars, the type of cable railway in which the ascending and the descending car counterbalance each

¹Hutchinson, II, 66.

²This and the following paragraphs describing the Rimac canyon were written from the facts included within Fawcett, pp. 46-52.

other in weight, were undesirable because of the length of the proposed railroad. Cogs and inclined planes were undesirable for the same reason.

Because the Rimac torrent occupied the narrow valley floor, much of the track would have to be supported on ledges cut in almost perpendicular rock faces along the sides. This and the many curves foreseen would make the matter of concentrated load and gross-train weight very important. The standard gauge would allow gross-train weight to be more evenly distributed. Therefore it was decided that a standard gauge steam adhesion railroad should follow the Rimac up to and over the summit. However, the problem of steep grades remained. Horse power, train lengths, speed, and the ability to go up to the summit and come back down again necessitated that the grade should not be too steep.

Meiggs tackled this monumental task of gradients at a time when the difficulties of the construction of a railroad in this area were far more formidable than they would be today. Behind him were the limited experience of two comparatively easy lines³ and the existence of three other short West Coast roads of little importance.⁴ None could be of the slightest use as a guide to what might be expected in the high cordillera.

To obtain greater length to cut down the grade of the Rimac canyon it was necessary to back-track into less steep lateral valleys, circling around to regain the former course toward the summit, sometimes traveling an extra five miles in order to gain one. However, this was not always possible since the Rimac canyon was a succession of funnel-shaped valleys, one above the other, their wide mouths at the bottom of a steep slope and their very restricted throats ending in a high step below the mouth of the next. Within the confines of each of these valleys, tracks could be laid on ledges along

³The Valparaiso-Santiago and the Mollendo-Arequipa lines.

⁴The line from the Chilean seaport of Caldera fifty miles inland to the mining village of Copiapo; the thirty-seven mile road between Arica and Tacna in southern Peru; and the Callao-Lima Railway.

one of the walls, well above the Rimac. But how could the steps at the throat of the valleys be climbed? There was no room for hairpin curves. Grades could not be made steeper than was planned, for train lengths would be too short for economic operation. Racks, funiculars, cogs, and inclined planes were undesirable because of complexity, expense, and speed limitations. Nowhere had a line so physically exacting been attempted.

Meiggs succeeded in mounting the difficult steps of the funnel-shaped valleys by the system of zigzagging up the sides of the canyon through a series of short sharp angles. The train would proceed forward toward the summit as far as possible until stopped by lack of room on the valley floor or the sometimes vertical cliffs of the valley. Then a switch would be thrown to enable the train to back track on itself into a connecting track going backwards, but on another higher elevation. After running on this track and through another switch, the train would return to its original course on a still higher shelf and having gained sufficient altitude to continue, would follow the precipitous river without exceeding the planned grade.

The zigzag is sometimes called a double "V" switch: two "V's" of track are laid out opposite and atop one another with one length used by both. This double "V" switch resembles the letter "N" on its side with each length on a higher shelf of the mountain. Its drawbacks were loss of time in switching, retrogressing, and the limited train lengths, which had to be short enough to fit on the switchback. However,

When Meiggs built the Middle Section of the Central, the zigzags were long enough to contain in one piece anything that could be tied on to the tail of the little Rogers Monguls, and time lost in switching through a "double" was not much more than would be required for engaging with a rack and negotiating the section at a speed somewhat under the usual speed with adhesion alone. Moreover, in Meiggs's day rack-adhesion operation was a novelty to be found only on one or two toy mountain railways in Europe.⁵

Therefore the best grade was obtained by the use of the double "V" switch and by back-tracking into less steep lateral valleys, thus extending the

⁵Fawcett, p. 52.

length of the line from the less than ninety miles of the Rimac's course to slightly more than one hundred miles between the coast and the summit. With in this distance were laid seven such double "V" switches.

In order to determine the grade and the location of the subsequent track, it was necessary to know the exact contour of every depression and rise along the canyon of the Rimac. However, the Rimac's precipitous, sometimes, vertical cliffs rendered it impossible in many places for the engineers to trace the line on the surface by actually walking and measuring the path that the railroad was to follow. Therefore extensive surveys with level lines running up the various walls of the canyon were made, and a topographical map, in contour lines two and one-half and five meters apart, was carefully constructed, on which the general course of the line was projected.⁶

Crews were sent throughout the whole length of the route, up to and over the summit, and beyond to Oroya, to survey, measuring every wrinkle of the terrain so that an accurate topographical map could be constructed from which the chief engineers would decide the best and least costly route. One can imagine each funnel-shaped valley dotted with men, teams of surveyors with the transit men at one point and their companions with the stadia rod at another, measuring the line between them for its horizontal and vertical distance. They, no doubt, proceeded by setting up a base-line on level ground which could be easily and accurately measured physically with chains or steel rods (Brown and Sharp's, United States Standard). When the base-line had been established, checked, and double-checked, the men would survey their way, station by station, in slowly graduated steps up the sides of the canyon to obtain numerous readings for establishing contour lines. All the findings, readings, and mathematics of the first engineer would be checked and double-checked by a second and third so that if there were any mistakes,

⁶The facts which are embodied in this and the following paragraphs describing the surveying of the route were gleaned from an article on the Central Railway which was published in The Engineering and Mining Journal, XXVI (December 21, 1878), pp. 435-36. Hereafter this article will be referred to as "E&M.J."

they could be corrected by back-tracking until the error was discovered, or by a return to the accurate base-line. This information would be transferred to those making the topographical maps which were subsequently studied to decide the approximate location of the track. Next, orders specifying the proposed line would be issued to the line engineers who would again ascertain or "locate" the approximate route to make doubly sure a track could be laid there. So stubborn was the terrain that at least fifteen miles had to be located ahead of the grading crews lest some new obstruction be met that might necessitate a new location, commencing many miles back on the line.

Coming from all over Europe and America, the engineers used their own familiar surveying instruments. Theodolites, transits, tachymeters, plane-tables with stadia telescopes, and levels of various makes were used, French, English, and American. Gurley, of Troy, New York, and Stockpole of New York City, supplied the greater number of the American instruments. The instruments could accurately survey only a certain distance at certain angles from a level position. The rocky slope of the canyons rising at angles of forty-five to seventy-five degrees, made it necessary to resort to triangulation in a great number of places in order to "carry the line" past insurmountable obstacles. Triangulation is the method by which any inaccessible area can be measured by taking linear and angular measurements of nearby accessible terrain from which mathematical deductions are made of the dimensions of the area not actually surveyed. The name of this method probably arises from the series of triangles mathematically plotted around the inaccessible area whose dimensions are deduced from the relationship between it and the triangles, which represent accessible survey readings, surrounding it. Triangulation was used successfully in a number of places especially in difficult portions of the route where the use of the surveying instruments was altogether too unreliable and inaccurate because of the intense slope of the walls of the canyon and where the physical marking off of the distance with chains or steel rods was impossible from the nature of the ground. Even tunnels were located by triangulation, simultaneously worked from both ends by different teams of surveyors having a common base-line to insure accuracy. The triangulation, as was every part of the work performed by one engineer,

was verified before the actual work of construction was begun; and as proof of the extraordinary accuracy attained, in the many tunnels there were no errors in alignment of more than a few inches.

It frequently happened that stations, the positions from which surveying observations were performed, had to be made in the face of the cliffs at points reached only by lowering the engineers and their instruments over the precipice by a rope. Days and even weeks were spent in blasting out a "footing" for such a station, and in constructing in the face of a cliff a road by which the station could be reached, even though this might be merely a ladder-way bolted onto the cliff's side.

Two letters written by the brother of Henry Meiggs, John G., during the preliminary Central surveys indicate the stubbornness of the terrain. He said, "Thorndyke has not yet returned. He must be having hard times as it has been an awful winter in the Mountains Juan Mesa returned, too much 'Sorochi' mountain or altitude sickness he left Dike camped in four feet of snow."⁷ A week later he wrote, "Thorndike arrived yesterday!! He has had a rough time of it, and says he never saw such a country. He Examined Sacis & Garcias proposed road going up, which he thinks impracticable, and returned by Backus road which is full as bad. The fact is, this is an awful road to make the best of it—"⁸

The finished railroad is a tribute to Meiggs and his many engineers, despite the lack of competent engineers throughout the early years of the construction of the Central. This was one of the many difficulties of John G., who supervised it, running the Lima office while Henry was elsewhere. In desperation he wrote to the boss on the southern line: "You say you are short of Engineers please take all of mine!! You may be able to do something with them, but I tell you beforehand God Almighty has done but little. Seriously, We must have some good Engineers. When Don Enrique

⁷To Joseph B. Hill (Mollendo), Lima, March 12, 1870 (MP 1, 64a).

⁸To Hill, March 20, 1870 (MP 1, 81).

arrives I shall insist on it, and if he doesn't approve my sending to New York, I shall do it nevertheless."⁹ The next day in writing to Don Enrique in Santiago, John G. complained of the engineer who was moving too slowly at San Pedro, and had not yet sent in the profile of the contours from which the topographical map could be prepared. The engineer promised, but John G. lamented, "Oh! for some live Engineers!!—" ¹⁰

Fortunately John G. did acquire some live engineers during the course of the construction of the Central. But even these, in locating the line had a difficult time in keeping ahead of the other crews who were leveling the barriers, making fills and cuts and piercing tunnels in preparation for those who would put down ties and lay rails. This is indicated by the correspondence of the boss of one of the labor camps on the Oroya line, a J. L. Wetmore who, with his crew, was employed in preparing the grade of the trans-summit section. In January of 1872 the camp was at Pachachaca, on the Yauli River, about fourteen miles from Oroya, working westward up to the summit.

In a letter directed to John G. at Lima, apparently written in his own hand, with his unique grammar, orthography, and punctuation, he complimented the engineering party headed by Martin Van Brocklin. "They are a number of men and hard workers but have a little time to keep out of my way on those plains they have been several times across the Sumet looking out for a pass to get over with the road. the line has been run to Yauli there they must come to a stand still until they know which raut they take to cross."¹¹ At the same time Wetmore wrote a letter to William H. Cilley in the Lima office giving a report of his own leveling progress and a fuller complimentary account of Van Brocklin and his party.

⁹To John L. Thorndike (Mollendo), May 10, 1870 (MP 1, 224a).

¹⁰May 11, 1870 (MP 1, 236).

¹¹January 31, 1872 (MP 750, 91).

Every thing here is going ahead lovley 1500 men at work I am running over the Pachachaca plains a good rait I will make a good show this month if rain lets me alone, and you can tell Sweet for me that Van Brocklin and his party are anomber one boys regular workers from morning until night and I am sure they have saved the Empressa some S/12,000 in Section 14 K and 16 K from Manning /profile/. . .and if they dont find out where they will cross the Summit soon, I will be on top of them at Yauli and they must know at Yauli which raught th/e/y take before they can start from there I will be at Yauli within 5 weeks so look sharp for the Summit.¹²

Van Brocklin and his party did find a route over the summit, one, however, which necessitated boring a tunnel nearly three-fourths of a mile long through a conical peak.¹³ This was built simultaneously from both ends. First a drift, about six feet by eight was driven into the top of the projected opening,¹⁴ bored for a distance of about one hundred feet by hand-tooling,¹⁵ from which the entire crown was opened. The lower portion of the tunnel was subsequently bored out in levels until a thirteen by eighteen foot bore had been made. Blasting holes were chiselled out of the hard and tough rock with Burleigh rock drills and diamond drills. Speed was the chief advantage of these drills¹⁶ which were set in motion by machinery worked by compressed air.¹⁷ The Rimac, hundreds of feet below, with its fall of from two to four hundred feet per mile, furnished excellent water power for compressing air.¹⁸

The construction of the tunnel produced unparalled difficulties. Among them was the difficulty of breathing in a very rarified atmosphere of over fifteen thousand feet,¹⁹ compounded by the poor, if any, ventilation

¹²January 31, 1872 (MP 750, 90). ¹³Fawcett, p 297. ¹⁴E&MJ, p. 436.

¹⁵Fitz-Roy Cole, The Peruvians at Home (London: Kegan Paul, Trench & Company, 1884), p. 218.

¹⁶E&MJ, p. 436. ¹⁷Cole, p. 218. ¹⁸Hutchinson, II, 68.

¹⁹J. Eglinton Montgomery, "A Railroad in the Clouds," Scribner's Monthly, XIV (August, 1877), p. 459.

within the tunnel itself.²⁰ Consequently, miners from Cerro de Pasco, accustomed to work at that great elevation and the most hardy "serranos" or mountain Indians were among the majority of the many employed.²¹ A subterranean stream under Mount Meiggs, as the summit peak was later called, and over the tunnel's roof²² impeded the progress at every step, often bursting through seams and driving the laborers from their work.²³ As the tunnel was under construction long before the completion of the railroad, an enormous amount of supplies of every kind had to be carried across the many miles of inadequate trails from the slowly ascending terminus of the rails by eight hundred cargo mules which were in constant use.²⁴ Therefore, all the provisions necessary for the sustenance of the large corps of workmen and all the materials necessary for the work—tools, powder, and machinery—even to the huge boilers for running the compressors—were brought up to this great elevation, piecemeal, during the tunnel's construction.²⁵

The summit tunnel, called Galera, is the world's highest tunnel, passing over the Continental Divide on an underground mainline summit of 15,694 feet. It is 3,860 feet long and nearly one hundred rail miles from Lima. Galera is on a vertical curve with a grade of four and one-half per cent for the three thousand feet inward to the apex,²⁶ and a one and one-half per cent grade down to the eastern entrance.²⁷ Though constructed entirely through rock, it is walled and arched in stone masonry, with cement mortar,

²⁰Fawcett, p. 294. ²¹E&MJ, p. 436. ²²Fawcett, p. 297.

²³Montgomery, p. 459. ²⁴E&MJ, p. 436.

²⁵Charles F. Lummis, "The Tallest Railroad," Harper's Weekly, XLI (January 23, 1897), p. 87.

²⁶Fawcett, pp. 294 and 297. ²⁷Lummis, p. 87.

for about half its length.²⁸ The first locomotive went through the Galera tunnel in September, 1892.²⁹

The sixty-four other tunnels on the Central Railway were all built in the same manner as the Galera—by numerous men of different nationalities who were supplied with food and equipment from all over the world, brought to the sites by the already completed track or by the many company mules and llamas. Tunnelling was hurried along by chiselling and blasting out both ends at once and sometimes from the middle also, by means of an opening in the wall. Although most of the tunnels were not long enough to block the air completely, the side holes were left open as aid to their ventilation. Several artificial tunnels were built also. Their purpose was to carry wet slides, streams, washouts, flash floods, or snow safely over the track.³⁰ In one instance a tunnel was built to divert the Rimac from its original course so that the tracks could occupy its bed.³¹

It was important not to exceed a certain grade because considerable more horse-power is required to pull a train up than to travel over level ground. With too much horse-power, an engine would spin on its wheels. Therefore, the maximum gradient permitted under the contract was slightly more than four per cent, a one foot rise in twenty-five, or 211 feet to the mile on the tangent, or straight line; and three per cent, a one foot rise in thirty-three, or 158 feet to the mile on curves. The lesser grade was prescribed on the curves because it is more difficult for a train to ascend and change its direction. Also the curves were not to be too sharp—no tighter

²⁸ Maurice S. McKay, "Central Railway of Peru," (paper read [?] at the Institution of Civil Engineers of Ireland, March 6, 1895), p. 2. This was a four-page thermofax copy of a printed article without further identification, loaned to the author in 1963 by the then manager of the Central.

²⁹ Lummis, p. 87. ³⁰ Fawcett, pp. 53 and 293-294.

³¹ Lummis, p. 87; Theodore Child, "Impressions of Peru," Harper's New Monthly Magazine, LXXXII (January, 1891), p. 272.

than a curvature of 120 meters radius.³² The entrance to all curves of two hundred meters or less was eased by laying in a few pairs of rails to a larger radius.³³ There was a distance of forty meters of direct line between two curves turning in opposite directions, although in some special cases, this was reduced to fifteen meters. These procedures made for an "easier" line with reduced wear and tear for the rolling stock.³⁴ The majority of the tunnels are on curves of 120 meters radius, with even some tunnels having reverse curves. Also, all the tunnels and many bridges are on gradients varying from a one foot rise in fifty, to one in twenty-five.³⁵ As the fall of the Rimac, varying from two to fifteen per cent or more,³⁶ considerably exceeded the limits of the gradient as set in the contract, greater length at the allowable grades had to be obtained by running up lateral valleys and by zigzagging up the sides of the canyons³⁷ through the series of short, sharp angles, already described and generally known as the switchback. But switchbacks were not enough. Often bridges were necessary to span the deep ravines. However, bridges were not available in Peru. They, together with most of the other materials, and even men, had to be imported from Europe and America. This was most troublesome, considering only the number of letters involved.

The bridge-building on the Central Railway can be inferred from the Meiggs Papers. After surveying the location, the resident engineers would specify the type and dimensions of the bridge required, which the Lima office would forward to its agents in France, England, or the United States. There the bridge would be built to the specifications, but sometimes the agents, unfamiliar with the unique Rimac canyon terrain and incapable of visualizing it from descriptions, would alter the dimensions of the bridge

³²E&MJ, p. 435. ³³McKay, p. 3.

³⁴Juan Jose Castro, Treatise on the South American Railways and The Great International Lines (Montevideo: La Nacion, 1893), p. 407.

³⁵McKay, p. 3. ³⁶Hutchinson, II, 66. ³⁷E&MJ, p. 435.

to what they thought more suitable. The bridge would then be built completely or in sections, and sent by ship. Oftentimes, the bridge would be accompanied by the manufacturer's men. On arrival in Peru, the bridge would be transported by rail as far as possible and then by mule and llama up the canyon to the desired site. Once there it would be assembled and erected or launched whole. However, the system of building a bridge, sending and launching it whole, was defective since it tended to strain the structure in its weakest points. The system of sending accompanying men was too expensive both in time and in money.³⁸

From San Bartolome to Surco, although a distance of only six miles, the journey is more than doubled because of the roundabout way in which the railroad had to be built.³⁹ Between them is situated the Verrugas "quebrada," a deep canyon which lies at an angle to that of the Rimac. This intersecting gulch was somewhat filled in by blowing down its sides with a blast of seventy-five tons of powder, exploded by galvanic wires.⁴⁰ However, it was still necessary to span the remaining chasm with an iron viaduct. This bridge, with Fink trussed girders 575 feet in length, was supported upon three piers of wrought-iron columns or rods, of which the central, over 250 feet high⁴¹ was sunk into a twelve-foot pit.⁴² The third largest bridge in the world at that time,⁴³ it was built by the Baltimore Bridge Company⁴⁴ from plans sent from Peru, shipped in pieces which were assorted, landed and transported to its site, put together and erected by the Central's own men. It

³⁸John G. Meiggs to John Slater (Concepcion, Chile), Lima, January 2, 1874 (MP 10, 119-121).

³⁹Hutchinson, II, 66. ⁴⁰Meagher, p. 277.

⁴¹Montgomery, p. 451. ⁴²Lumris, p. 86.

⁴³Fawcett, p. 52. ⁴⁴Stewart, p. 170.

arrived at the end of January, 1872, and took three and one-half months to erect.⁴⁵ Don Enrique was so proud of the Verrugas Bridge that he had Tiffany and Company strike a handsome medal to commemorate it.⁴⁶

The engineers were proud of the Verrugas Bridge, also. But they would have preferred a variation in the foundations which would have eliminated the need for the central pier. Unfortunately, the pier was 'eliminated' in 1889, by the Rimac, grown to a foaming torrent by a prolonged season of heavy rains. Rushing down the Verrugas ravine with tremendous force, the Rimac carried enormous boulders which crashed against the central pier. This caused a complete collapse, except that one line of rails, well-riveted together, without any medial support, still swung across the canyon.⁴⁷ A wire cable was thrown across the ravine between the two shore ends, and passengers and goods were swung over the terrible yawning abyss on a square board or in a cage-car until a second bridge was erected.⁴⁸

The new steel viaduct was erected by the American Bridge Company and put into service on January 3, 1891.⁴⁹ Having learned the folly of placing a pier in the middle, two vertical towers, each 175 feet in height⁵⁰ and sunk into the sides of the three-hundred-foot ravine, were used to support the middle span of this cantilever bridge. This second viaduct was calculated for a load considerably less than which later it was called upon to bear and became quite a "lively dancer" before its removal. The third bridge to span the Verrugas quebrada, a lattice girder supported by side towers, was built in 1937, by the Cleveland Bridge and Engineering Company of

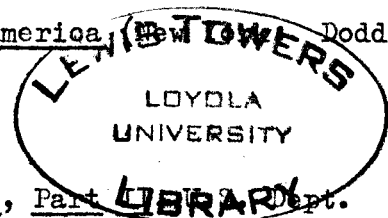
⁴⁵John G. Meiggs to W. Tipton (Arequipa), January 17, 1872 (MP 5, 112) and to J. Slater (Concepcion, Chile), January 2, 1874 (MP 10, 119-121).

⁴⁶Stewart, p. 170. The medal is also described here.

⁴⁷Annie S. Peck, A Search for the Apex of America, (New York: Dodd, Mead and Company, 1911), p. 102.

⁴⁸Child, p. 271. ⁴⁹Fawcett, p. 52.

⁵⁰W. Rodney Long, Railways of South America, Part I, Dept. of Commerce Trade Promotion Series No. 39 (Washington: U.S. Government Printing Office, 1927), p. 215.



England.⁵¹ It was named "Puente Carrion" at its official inauguration in memory of the young Peruvian medical student who gave his life in order to discover the mystery of the dreaded "verruugas" or "Oroya fever," of which more will be said in the next chapter.

Farther up the line between Surco and Matucana in a less difficult area, a bridge spans the ravine of Challapa. This is a continuous lattice girder, 363 feet in length, supported by steel columns sunk into the sides of the ravine. The central span between the side supports measures 177 feet. The impressive spidery structure, built in 1872, was designed by Messieurs Eiffel, whose names are now associated with the Paris tower.⁵²

With building bridges in France, England, and the United States for sites in the Peruvian Andes, there was much loss of time, much loss of money, and often much loss of temper. Dissension is indicated between the resident engineers and the distant bridge-builders by two original letters concerning the construction of the foundations of the bridge spanning the deep and precipitous gorge of Chaupichaca. Here the masses of mountains become grander and bolder, necessitating triangulation to locate the line. As the abrupt sides of the cliff offered no footing for either the survey or the preparations for the roadbed, the area could be reached only by lowering men on ropes. A foothold was cut in the rock-face, affording a holding for a wire cable which connected the workings with the bottom of the ravine—over one hundred feet below on the edge of the Rimac torrent—where the workmen's huts lay. Thereafter, the men were raised and lowered to their work in a swinging cage, and traveled up and down the suspended wire.⁵³

As soon as possible, the engineers began planning the type and size of the bridge required to carry the line through this most scenic but difficult area. Specifications for the bridge were sent to the Baltimore Bridge Company which proposed some changes and these were duly considered. Finally, the proper dimensions for the construction of the bridge were forwarded

⁵¹Fawcett, p. 52.

⁵²McKay, p. 3.

⁵³Cole, pp. 212-213.

through the Lima office to New York.⁵⁴ However, the New York agent, Mr. Walton W. Evans, advised a change in the foundations of the bridge which necessitated about ninety cubic yards more of masonry than the original plans. This would have made no difference if the additional stone had been readily available in the locality, but such was not the case at Chaupichaca. Therefore, the work was delayed "very materially."⁵⁵ Not only was the additional stone expensive, but "the difficulties to be overcome in getting the stone and other material necessary to build these piers to the place, can only be appreciated after a personal examination."⁵⁶

Mr. Martin Van Brocklin, the resident engineer attempting to bridge the Chaupichaca gorge, was entirely at a loss to understand what considerations could have induced or suggested the change in the foundations, involving a peculiar and exceptional feature of construction which, in his opinion, was without reason or prudence, not only because of the pecuniary consideration but for want of adaptation of the work to the locality. Having previously understood, from John G. in Lima, that the bridge was to be built in accordance with the dimensions sent from Peru, Van Brocklin felt that if this had been done, the matters about which Evans, in New York, seemed to have had so much trouble, would have been avoided. Though always glad to receive instructions and advice, the resident engineer felt "that if the labor, time and study devoted to changing plans, had been expanded in executing those as sent—the work would have been in the hands of the builders in shorter time after the order was given—executed for less money, and you would have had a more credible structure when erected." When the bridge of Chaupichaca with

⁵⁴Lima, Martin Van Brocklin to John G. Meiggs, August 29, 1874 (MP "j").

⁵⁵V.G. Bogue, Division Engineer to Van Brocklin, Resident Engineer (Viso), San Mateo, June 4, 1874 (MP "j").

⁵⁶This and the following paragraphs concerning the foundations of the Chaupichaca bridge are derived from Van Brocklin's letters to John G. Meiggs (Lima), Viso and Lima, June 4 and August 29, 1874 (MP "j").

the change of Mr. Evans in the foundations would be examined by experienced engineers, Van Brocklin lamented, "it will be as difficult to give an intelligent reason for the peculiar character of the foundations for this bridge, as it has been to give an answer to the oft repeated inquiry—why a pier was placed in the center of the Verrugas quebrada."

Tempers did not cool immediately and many subsequent letters exchanged hands in the ensuing months. After having read a number of the New York agent's letters, the resident engineer again wrote John G. at the Lima office. He felt that Evans was trying to justify his position by suggesting that if anything was wrong, someone besides himself—Evans—was at fault. Van Brocklin stated that he did not appreciate the New Yorker's "ungenerous remarks" concerning Mr. Bogue, the division engineer on the line who had earlier complained of the additional masonry for the piers of the bridge. Van Brocklin believed that a man of ordinary capacity with the advantage of personal observation of the locality, could serve the company better than an expert in New York "who knows nothing of the circumstance." In a letter to John G. he wrote:

An experience of "a quarter of a century" ought to have been a Sufficient reason for a judicious Engineer not to attempt to prescribe the foundations of a Structure until he had some proper data concerning the matter and especially not, until the matter had been submitted to him— He would have you believe that but for his vigilance the iron work for the piers of this viaduct would have been below the surface of the ground. . . .

Did Mr. Evans have an idea to what depth it would be necessary to excavate for the foundation for these piers!— Could he by any possibility form an opinion what would be the relative surface of the ground—or rather loose stone— about those piers when that excavation was completed and the Stem foundations erected!—

The proposition to have someone with a "clearhead" examine this matter in New York, as well as the tone assumed by Mr. Evans in writing of this matter, clearly shows that he has no appreciation of the Magnitude and difficulty of the work on the Oroya road, nor of the ability required and displayed in its construction.⁵⁷ (Italics mine.)

⁵⁷ Lima, Van Brocklin to John G. Meiggs, August 29, 1874 (MP "j").

Unfortunately, none of the New York agent's letters nor copies of those which John G. must have written to both Evans and Van Brocklin were found. But from those available a vivid impression of the frustrations in surmounting the many difficulties posed by the stubborn terrain, and at times by the obstinacy of the foreign agents, can be had. Nevertheless, a spider-web iron Whipple Truss⁵⁸ bridge, over four hundred feet in length, resting on two steel columns, finally was built to span the Chaupichaca gorge. The stone and the additional ninety cubic yards, not available in the locality, probably was hauled up in advance of the track by hundreds of pack animals from the company quarry near Lima.⁵⁹

Another feat in engineering was crossing a deep gorge between San Mateo and Anchi called "Los Infiernillos," the little hells, where the Rimac passes through two walls of red porphyry that rise perpendicularly to a height of from one thousand to one thousand five hundred feet, with sides as smooth as mason work. The walls form two reverse quadrants,⁶⁰ and the river, here a mountain torrent, falls down a series of steps like a small Niagara,⁶¹ plunging, roaring, leaping, and foaming into the abyss. This chaotic labyrinth of giant cliffs, almost excluded the light of day and prohibited chaining and surface tracing to ascertain the contours. "Even to establish 'stations' for the triangulation, men were let down on ropes hundreds of feet, and spent weeks sometimes in drilling and blasting a foothold."⁶² Other men followed suspended in baskets to prepare for the bridge that would span the one hundred sixty foot chasm whose apparent depth had been lessened by the masses of rock thrown down during construction.⁶³ Although Meiggs threatened to hang it from balloons,⁶⁴ a substantial steel Whipple Truss structure spans over two hundred feet between the mouths of the two tunnels,⁶⁵ bridging the

⁵⁸ McKay, p. 3.

⁵⁹ John G. Meiggs to W.W. Evans (New York), April 27, 1870 (MP 1,210)

⁶⁰ Montgomery, p. 455. ⁶¹ Hutchinson, II, 76. ⁶² Lummis, p. 87.

⁶³ Montgomery, p. 456. ⁶⁴ Stewart, p. 153. ⁶⁵ McKay, p. 3.

little hells. Concerning this marvel of the Central Railway, a contemporary wrote: "Seen from the contracted valley beneath, a train of cars must appear to spring mysteriously and suddenly over the graceful little structure, and to disappear like a thing of will and might, burrowing through the very heart of the mountains."⁶⁶

The earthwork executed in the construction of the Central Railway was exceedingly heavy with the majority of the cuttings through solid rock. All cuttings and banks forming the roadbed had a minimum width of fourteen feet. The gauge is the standard fifty-six and one-half inches.⁶⁷ The permanent bed was well ballasted, originally with sand, clay,⁶⁸ and dirt, but now mostly with rock.⁶⁹ It was laid with steel rails weighing seventy pounds to the yard, connected together by deep section fish plates, and fastened to California redwood ties with four dog spikes to each tie, six being used on all curves.⁷⁰ The ties used, six by eight inches by eight feet, also came from Chile and Colombia. Screwed bolts instead of spikes held the rails to the ties on heavy grades.⁷¹ The rails were further secured on curves by tie-rods, five-eighths of an inch in diameter, spaced twelve feet apart. On curves the outer rails were elevated, banked as it were, as a necessary precaution to keep a descending train, with its higher speed, from leaving the track.⁷² However, the outer rails were held to a maximum elevation of four inches, because of the relatively slow climbing speeds.⁷³ The ascending train had a tendency to overturn the inner rail because the elevated rail did not suit its slower speed. Therefore, cast iron knees were bolted to the ties on the outside of the inner rails on curves in order to give them additional support.⁷⁴

⁶⁶Montgomery, p. 456. ⁶⁷McKay, p. 3. ⁶⁸Long, p. 214.

⁶⁹Fawcett, p. 54. ⁷⁰McKay, p. 3. ⁷¹Long, p. 214.

⁷²McKay, p. 3. ⁷³Fawcett, p. 54. ⁷⁴McKay, p. 3.

Safety switches, a typical feature, were installed at frequent intervals and were so arranged that they were always open. They were normally set for the turnout by means of counterweights. Descending trains had to stop while a brakeman ran ahead to hold down the switch lever until the train had passed over the blades. If a train approached out of control, it ran out on this switch and was forcibly stopped. "Originally, the escape tracks were mere stubs, often ending abruptly against a vertical wall of rock—a convenient if disastrous stop for a runaway—but some have now been lengthened into sand-drags, where space permits.⁷⁵

As another necessary safety measure, two distinct systems of brakes were installed on each engine, the Chatalier or water and the hand-brake. In the 1890's the locomotives were fitted with steam and vacuum brakes. Now the Peruvian law requires three distinct systems on each engine; power (automatic airbrake with straight air control), hand, and water. Each individual car is fitted with its own set of screw brakes worked by hand and another set connected to one of the engine's systems. These are tested regularly for each run. The engine is also supplied with cast-iron brake shoes. In pre-air-brake days, changes of brake shoes for every downhill trip were not uncommon, since the thick blocks of metal were burned thin in one run or less.⁷⁶ An additional precaution is the use of a pilot handcar, run by gravitation alone and equipped with a hand brake, which precedes the train on its descent by perhaps half a mile in order to protect the train, should there be any obstructions on the line. These handcars were used by engineers and others who had occasion to inspect the line⁷⁷ and sometimes to "thrill" visitors who could coast from the summit tunnel, Galera, over one hundred miles to the sea "dashing at lightning speed through dark tunnels, over a bridge, then around curves so sharp that only a few feet ahead are seen at one time,

⁷⁵Fawcett, p. 54; Long, p. 214.

⁷⁶McKay, p. 4; Fawcett, pp. 60-61, 65, 269.

⁷⁷Fawcett, p. 271.

then skirting the precipice at the foot of which dash mad torrents, the scenery dashing by as if enveloped in a fog."⁷⁸

Much foreign capital and a great increase in trade were apparent in Peru during its guano development and subsequently with the many activities connected with its "railway fever." During the construction of the Central Railway, capital came from England and France.⁷⁹ Much of the stationary machinery and plant necessary for the construction operations were brought from England as were most of the rails.⁸⁰ France and England at first supplied the iron bridges, but subsequently they came from the United States since the American bridges were preferred chiefly because of their better and more simple construction. The surveying instruments and equipment were of various makes, at first mostly French and English, but later American.⁸¹ Also from the United States came the lumber, wheelbarrows, and much of the other construction material.⁸²

Most of the engines and other rolling stock were American, the cars coming principally from Gilbert Bush and Company, Troy, New York⁸³ and the locomotives, of which the majority of the twenty-six in service before 1877 were bought from Rogers Manufacturing Company of Paterson, New Jersey and the remaining five from Danforth.⁸⁴ The locomotives cost on the track about twenty to twenty-five thousand dollars and the first class cars about fifty-five hundred with the prices in American gold coin.⁸⁵ The locomotives with coal and water weighed about sixty-five tons⁸⁶ and took up four or five

⁷⁸Ernest C. Rost, "The Highest of All Railroads," The World's Work IV (September, 1902), p. 2517.

⁷⁹Watt Stewart and Harold F. Peterson, Builders of Latin America (New York: Harper & Brothers, 1942), p. 256.

⁸⁰G. Fred Collins, "Mining and Railway Development in Peru," The Engineering Magazine, XXVI (February, 1904), p. 655.

⁸¹E&MJ, p. 435. ⁸²Stewart and Peterson, p. 256. ⁸³Collins, p. 655.

⁸⁴Stewart, p. 159. ⁸⁵Collins, p. 655. ⁸⁶E&MJ, p. 436.

eight-ton cars which carried ten tons of freight each. In order to drag this weight from Lima to Chicla (eighty-seven miles from the sea) the locomotive burned seven tons of first class English coal, which was very expensive because of the importation and the quantity wasted by the continuous firing required to force the train up the steep gradients.⁸⁷ Later crude oil was used, supplied by the London and Pacific Petroleum Company from the Talera mines in northern Peru. This cost only half as much as the imported coal in time, money, and weight, because the oil was more efficient, with slight waste in the firing, if any, and because only three and one-half to four tons were needed for the same journey.⁸⁸

Other imported materials were the diamond drills which came from America and were worked by Rand air compressors.⁸⁹ The timber for the houses, bridges, tunnels, false works, railroad ties, and the like were brought from California and Oregon. The grain and provisions were imported from Chile and California.⁹⁰ The shops and stations were generally made of galvanized iron, the shovels were Ames and the iron water tanks were Pills' patent.⁹¹

The powder was imported also and for the great amount of blasting done in the construction of the railroads, five hundred thousand pounds of explosives were used per month.⁹² Over ten thousand men were employed at the same time and over one thousand mules, llamas, and horses.⁹³ The cost of the Central Railway was estimated at two hundred thousand dollars per mile. At least seven thousand five hundred lives were lost.⁹⁴ However, with the terrific cost of the railroad must be taken into consideration that

⁸⁷ Child, p. 272.

⁸⁸ McKay, p. 4. See also Fawcett, pp. 55-65, for the evolution of the Andean rolling stock.

⁸⁹ Collins, p. 655. ⁹⁰ E&MJ, p. 435. ⁹¹ Collins, p. 655.

⁹² Frederic M. Halsey as quoted in "Railway Expansion in South America," Bulletin of the Pan American Union, XXXIX (November, 1914), p. 761.

⁹³ E&MJ, p. 436. ⁹⁴ Collins, p. 655; Montgomery, p. 460.

the contract price for the 139 rail miles to Oroya included everything connected with the survey, construction, and right of way, besides the furnishing of all supplies, the building of necessary docks at Callao, of station, freight, and engine houses, and the supplying of a certain number of engines, coal, freight, and passenger cars--in short, the whole equipment of a first class railway. The cost of the construction of preliminary roads, mule paths, and additional roads to replace those occupied by the rails as they advanced, also must be considered. This was estimated to be five hundred thousand dollars, not counting the transportation costs over these roads in advance of the track by the many cargo animals whose fodder also had to be imported.⁹⁵

The striking characteristic on the Central Railway, as with everything else done by Meiggs in Peru, was that he tolerated no second-class work.⁹⁶ Despite his money-making instincts, Meiggs was surprisingly conscientious in carrying out the conditions of his agreements concerning the provisions of sound work and optimum equipment.⁹⁷ In 1890 when the Peruvian Corporation took over many of the railroads, the English engineers and accountants, after personal inspection of the Central Railway, said that it had been "substantially and even extravagantly built; but this only makes it all the more valuable for those who will have to work it, as it renders the cost of maintenance much less than would have been the case with a line constructed in a lighter and more temporary manner."⁹⁸ To this effect John G. reprimanded his agents in New York who seemed to think that because he asked for low prices that he meant "Cheap and Nasty." But such was not the case as both Don Enrique and John G. and all the others connected with the Central Railway of Peru wanted the best of everything—"So please to understand me correctly, I want always the best of Everything from Men to Materials."⁹⁹

⁹⁵Montgomery, p. 461. ⁹⁶E&N, p. 435. ⁹⁷Fawcett, p. 54.

⁹⁸"Abridged Report upon the Central Railway System" (London: James Livesey & Son and J. H. Duncan & Company, January 1, 1890), p. 31. (Mimeographed.)

⁹⁹To Walton W. Evans, May 17, 1870 (MP 1, 252).

CHAPTER III

THE CENTRAL RAILWAY--THE HUMAN SCENE

Meiggs believed that it was a good policy to employ native Peruvians, but sufficient man-power could not be found in Peru. This seems strange because for years African slaves and Indians had formed the backbone of the laboring class. However, in the early 1850's, Negroes had been emancipated, and the Indian poll tax had been abolished. Thereafter, both the Negro and the Indian were not disposed to work, and Peru lost the services of these laborers upon which it had come to depend. Peru lived at this time by means of her mines, her agriculture, and her guano trade. These depended upon enforced or hired labor. Negroes and Indians could no longer be enforced, and they were reluctant to be hired. The wealthy Peruvians, whose traditions and upbringing prohibited manual work, would not be employed. Colonists from Europe were welcomed, and attempts were made to attract them, but they did not supply what Peru really wanted--hands for cheap labor. In this dilemma Peru soon recognized the Chinese as a source of cheap labor and by various laws passed during the mid-century, began their importation. But even this source did not supply Peru's needs, not to mention those of Don Enrique who, in 1870, had already begun other railroads before finishing his first.¹

It was to be expected that in order to solve this question of man-power, the contractor would have recourse to Chile where he previously had built the Santiago-Valparaiso Railway with the help of some nine thousand

¹Fawcett, pp. 40-41.

Chilean laborers. They were notorious for their skill in handling razor-sharp knives, their love of liquor, their addiction to gambling, and their hatred of any sort of discipline. However, Meiggs "tamed" them by fair treatment and consideration of each one of them as an individual. Therefore, they responded when notices began to appear in Chilean newspapers inviting recruitment for work in Peru.² The Chileans were first employed on the railroad projects in southern Peru. Later a large force of them moved up to central Peru for the construction of the Oroya line. Because they were physically unsuited to work in the higher altitudes, the Chileans, in 1870 and 1871, constituted by far the larger part of the laborers on the lower section of the Oroya Road. Unfortunately, many lives were lost during the construction in this area due to the then little known diseases, "verrugas" and Oroya fever. The latter is so named because of its prevalence on the line, although the town of Oroya is many miles distant on the eastern slopes of the Andes. It is now known that both Oroya fever and verrugas are different manifestations of the same disease, the former, generalized and the latter, local.

Oroya fever, in its visible manifestation, begins with malaise, irregular remittent fever, exhaustion, headache, pains in the bones and joints, and the rapid development of a severe anemia. The mortality is from twenty to forty per cent, death usually occurring within two to three weeks. In patients who survive, the constitutional symptoms and the anemia gradually abate, but within a few weeks, almost invariably, the wart-like eruption (verrugas) appears. This cutaneous eruption comes out as many bright red spots which develop into lumps attaining the size of a pea or less often, of a pigeon's egg. The smaller lumps appear on the face, extensor surfaces of the extremities, and frequently, the mucous membranes. The larger are usually located about the joints. Since the lesions are extremely vascular, they frequently ulcerate and may bleed profusely. After two to three months the

²Stewart, pp. 26, 112-115; Fawcett, pp. 28 and 44.

lesions gradually disappear. Although the mortality at the verrugas stage is lower than that at the fever stage, death may result from hemorrhage or secondary infection.³

Mr. Thomas Hutchinson, the British consul-general in Peru during the construction of the Central Railway, assumed that Oroya fever could not be marsh malaria because of its appearance between six and nine thousand feet. Yet, he attributed it to the same principles which predisposes one to malaria, that is, loss of animal heat, sensitivity to the cold, and a lowering of the vital powers. He believed his theory was proved by the number succumbing to the disease in the 1870's.⁴ Although the mortality of ten thousand for the middle section of the Central Railway is somewhat of an exaggeration, it is true that in this area a company hospital had to be built to accommodate the engineers and laborers who fell victim to the disease. Of this establishment, "La Esperanza" (Hope), built at San Bartolome, Hutchinson, who visited it, declared that

like all such establishments organized by Mr. Meiggs, [it] is deficient in nothing that can conduce to the comfort of those cared within. It has 153 beds, but at the time of my visit there were only seventy-five patients in it. Amongst them were some very nasty cases of verrugas.

Oroya fever and the subsequent verrugas caused many deaths, especially among the Chileans. Being unacclimated foreigners and working long hours each day, sometimes under a roasting sun, they, according to Hutchinson's theory, had intensified predispositions to the disease, and had further lowered their vital powers "by swallowing indiscriminate quantities of Pisco, the intoxicating spirit made from sugar-cane. This liquoring with the Chileans went on sometimes through the whole night, concurrent with their gambling."

³E. R. Stitt, Paul W. Clough, and Sara E. Branham, Practical Bacteriology, Hematology, and Parasitology (10th ed.; New York: Blakiston Company, 1948), p. 187.

⁴Hutchinson, II, pp. 61-64 give the Englishman's opinion of the disease, some of which is presented in the following paragraphs.

Despite the care given by the company hospital, the percentage of deaths was great. The situation, at length, became so grave that the Peruvian government appointed a commission to inspect the line and report on its sanitary conditions. The report, dated April 12, 1871, revealed that the mortality percentages for the hospital of La Esperanza increased from the middle of February to the date of the report from eleven to twenty per cent. Other reports, later in the year, were similarly shocking. In the meantime, a difficult problem for the Empresa developed. Either the laborers had no confidence in the company hospital, or they were afraid of the deadly climate of the place. In any case, they fled in considerable number to Lima and Callao, leaving the works without sufficient hands. Figures furnished the Chilean officials revealed that about one-fourth of the total Chileans treated in the Lima hospitals from April through August died.⁵

Being little known, the disease was believed to follow "a single draught of the poisoned" water.⁶ A bridge on the Oroya line was called "Aqua de Verrugas," water of warts, because during its construction as many as eighteendaily are said to have succumbed to the disease.⁷ Those who were fortunate to rally from the disease were often left disfigured, exhausted, and liable to other maladies. One such was a Mr. W. M. Wilson who, having rallied sufficiently, returned to the United States. Writing back to John G. Meiggs from Boston, he said:

My health has improved wonderfully. . . .and I am now in a fair way of ridding myself of "Verrugas" at last--I have suffered torments with them since leaving Peru, to say that they came out on me, by thousands, would be putting it mildly, and I have as yet, found no doctor, who had ever seen, or heard of the disease, and have been an object of curiosity to all with whom I have met.

⁵Stewart, pp. 175-177. ⁶Meagher, p. 278.

⁷E. B. Clark, Twelve Months In Peru (New York: Macmillan, 1891), p. 94.

⁸October 26, 1871 (HP "f").

Doctors were working, however, to find the cause of the disease. In 1885 a young Peruvian medical student, Daniel A. Carrion, inoculated himself with the blood of a verrugas lesion. He subsequently died of Oroya fever, thus proving the connection between the two. His memory has been perpetuated in various form—one being a bridge bearing his name which was the second to replace the original bridge, Aqua de Verrugas, destroyed by a land-slip in 1889. It is now known that the fever is carried and transmitted by a mosquito in the same way as malaria.⁹

At about this time the Chileans were becoming quite disillusioned with their life in Peru. The high pay which they received was in actuality worth less than they had anticipated on account of the rampant inflation brought about by the government's spendthrift policies. There was bad feeling between the Chilean and the Peruvian laborers. More serious, perhaps, than any other disadvantage was the fact that the Peruvian local authorities, if there were any in the sparsely inhabited, difficult terrain of the Rimac canyon, did not always maintain order and protect the worker in his life and in his rights. These, together with the seemingly unhealthy climate and the dreaded disease, were the reasons that large numbers of Chilean laborers deserted. The desertion coupled with the frequent and bitter attacks of the Chilean press plus the arrival of thousands of other Chilean laborers only aggravated the already grave situation.

The Chilean, with his love of liquor and gambling, and his hatred of discipline, was by no means a peaceful laborer. Many breaches of the peace occurred of which the uprising at Ocatara on November 17, 1872, was the bloodiest. Ocatara is located about sixty miles up the Rimac canyon from Lima where the area is generally wild and either comparatively or entirely uninhabited. A drunken Chilean caused a disturbance among some Peruvians and the incident erupted into several days of bloody battle between the two nationalities. This resulted in wounds and deaths for many and the flight of the Peruvians to another camp. Shortly the most culpable were

⁹Stewart, p. 175 and Fawcett, p. 53.

arrested and sent to Lima because the local facilities of detention were inadequate. However, the Lima court lacked jurisdiction over crimes committed outside its district. In the ensuing delay, the Chilean diplomatic agent clamored for repatriation as the only expedient. This was done at the expense of bitter criticism after the whole of the Chilean problem had entered the field of diplomacy and occasioned exchanges of a nature not entirely amicable between Chile and Peru.¹⁰

It is no wonder that John G. was badly out of sorts with the Chileans and wrote to the agents in Valparaiso saying, "please do not send any more Chilean peons here on any terms whatever. I have just sent 240 back, and am thoroughly disgusted with them."¹¹ Although wanting no more for the Oroya road, he permitted the sending of small numbers for the construction of the southern line.¹² However, less than two months later, he complained "that not more than one half [of the] peons sent from Chili ever reach [the construction camps] and that of those [who do] nearly all desert at the first opportunity. I have to request you to discontinue entirely the engagements [drafting of laborers] for all the roads."¹³

The trouble caused by the Chileans was one of the chief reasons for the use of Chinese labor on the Oroya line. John G. believed that for railway work the Chinese were the best men to be had. "All speak highly of them who have worked them, as docile, industrious men. Henry [doesn't] seem to think much of them, but as they are always sober, [which could not be said of the Chileans] and are accustomed to work by the month, it seems to me they are just the men for both roads [the Arequipa-Puno and the Oroya]."¹⁴

¹⁰See Stewart, pp. 121-126, 171-186, 203 for the experiences and consequences of the Chilean laborer in Peru.

¹¹To Watson and Meiggs, December 30, 1871 (MP 5, 318).

¹²January 3, 1872 (MP 5, 331-332).

¹³February 21, 1872 (MP 5, 615). Portions of this letter-book were badly damaged, however, the words in brackets give the probable letter.

¹⁴To Joseph Hill (Mollendo), July 20, 1870 (MP 1, 403-404).

The Meiggs Papers contain many subsequent allusions to the Chinese—their leases, contracts,¹⁵ the food and clothing provided them, proper treatment for them on the line, and orders to keep their records separate from the other laborers. There is, for example, an estimate of the cost of woolen clothing for the Chinese made by Fox Sawers and Company of Lima in a letter dated October 14, 1871. It described the clothing as:

Pants of best heavy twilled pellow made of strong long staple wool with strong calico waist lining & pocket & Shirt or Blouse of the same material with side pocket as per sample.

A thousand suits of the above well and strongly made suitable for the requirements of heavy work, can be provided at a cost of Five Soles twenty five cents S/5.25 per Suit.¹⁶

This original letter was marked "Answered October 14, 1871, accepting proposal." Another letter indicated that Messieurs William Gibbs and Company had many shirts and pants which Meiggs wanted for the Chinese. Meiggs wondered if he could get them duty free.¹⁷ On January 22, 1872, two hundred "Chinos" were sent to the Chimbote line in northern Peru with a suit of clothing, a pair of shoes, a hat, and two blankets apiece, besides one hundred quintals of rice and cooking utensils.¹⁸ However, spoons ("They use them.") and salt were forgotten and sent later.¹⁹ The following year the boss on the Chimbote line was told to build a hospital at once since "It is a necessity" because "It is the old story Opium."²⁰

¹⁵In MP "1" (bundle) there are several Chinese contracts.

¹⁶(MP "d").

¹⁷Meiggs by J.H. Sherman to Edmund Sartori (Callao), Lima, May 4, 1872 (MP Blur, 367).

¹⁸John G. to A.A. Locke (Chimbote), January 22, 1872 (MP 5, 446-447).

¹⁹Meiggs by Sherman to Sartori, February 1 + 19, 1872 (MP Blur, 213 and MP 5Lo, 247).

²⁰John G. to Locke, January 2, 1873 (MP 8, 280).

There were more than five thousand Chinese employed on the Central line.²¹ All the line bosses were instructed to "Be careful to keep your 'chinos' straight so that you can always know them by Camp Nos. & Contract Nos."²² and to keep the accounts for their expenses "entirely separate" from those of the Indians.²³

Although the accounts of the treatment of the Chinese coolie in Peru are not favorable,²⁴ the treatment of the Chinese in Meiggs's employ was comparatively good, if those who had direct charge of them on the works heeded the advice and directions of the general superintendent.

Food for Chinese Do you give them bread, with their tea in the morning before going to work?—If not it should be done as we have found on this road (the Oroya) that they need a change of diet, and liberal food, and improve on it. I would like you to be very liberal to all who are, or may be sick in the Hospitals, giving them bread, tea,²⁵ & coffee and in fact liberality will be found the best economy.

The inspection of five hundred Chinese at the San Bartolome camp on the Central gave the British Consul-General much pleasure and his description of their well-being seems to indicate that the line bosses did heed the advice and directions of the Lima office. The Englishman's account stated that the Chinese:

had a large galpon, or wooden shed, to sleep in; it is, in fact, a wooden house, enclosed and excellently ventilated—their sleeping-places being arranged in the style of sailors' bunks on board a ship. It is not more than a few hundred yards from Captain Heath's house, on the top of the hill. The flooring is wooden, raised four feet above the ground; and to the capital arrangements of this residence is due no small amount of the contentment of the Chinamen, as well as their good conditions. Some friends

²¹E&MJ, p. 436. ²²To Locke, February 1, 1872 (MP 5, 497).

²³To Keith & Co. (San Bartolome), June 8, 1872 (MP Blur, 457).

²⁴See Stewart, Chinese Bondage in Peru; Cole, Peruvians at Home; and Alexander J. Duffield, Peru in the Guano Age (London: Richard Bentley & Son, 1877).

²⁵To Locke, December 23, 1872 (MP 8, 239).

of mine. . . had previously told me that San Bartolome was the only place in which they had seen fat Chinamen in Peru. This was not surprising, for during their dinner-time, I saw them regaling on rice, and beef in great plenty. Before starting in the morning for their work, they all get bread and tea, and the whole arrangements here plainly indicate, that John Chinaman would have little to complain of, if he were treated everywhere in Peru as he is on the Oroya railway line by the employees of Mr. Meiggs.²⁶

The Chinese usually were employed on the lower sections of the Central Railway so that their labors were not lost to "soroche," altitude sickness. Soroche is caused by the imbalance of bodily and atmospheric pressures in high altitudes, aggravated by the deficiency of oxygen for breathing. It may be accompanied by a sensation somewhat resembling seasickness, besides violent headaches, dizziness, and general debility. Other symptoms are nose-bleeds, earaches, irritability, and sleeplessness. With precaution, it is possible to become acclimated, but care should be taken to return to lower altitudes every six months. Soroche is less fatal than disagreeable, but it makes railroad construction for almost all except the mountain Indians extremely difficult.²⁷

Illustrative of the day by day process of constructing the Central Railway are the letters of Jesse L. Wetmore who, it will be remembered, with his crew, was employed in preparing the grade of the trans-summit section.²⁸ Busy at Pachachaca, on the Yauli River, only fourteen miles from Oroya, at the end of June, 1871, a year later he had moved upward to the village of Yauli, and by September, 1872, had established his headquarters at Visca,

²⁶Hutchinson, II, 65-66.

²⁷Lummis, p. 87; Montgomery, p. 456; For the effects of high altitudes see Carlos Monge, M.D., Acclimatization in the Andes, translated by D.F. Brown (Baltimore: Johns Hopkins Press, 1948).

²⁸The letters are found in a copy-book which bears (or did at one time) the number "750." In its six hundred or so pages are duplicates of the correspondence between Wetmore and the Lima office and the various bosses of the other labor camps.

only a few miles east of the Galera tunnel site. The elevation of Pachachaca is slightly more than thirteen thousand feet, while that of Visca is about fifteen thousand. The last of Wetmore's letters is dated, "Visca, February 24, 1873." Since both Chileans and Chinese were found to be unsuited to heavy work at these high altitudes, his laborers were all Andean Indians, physically adapted to life in the rarefied atmosphere.

Unfortunately, the "serranos," mountain Indians, preferred abject poverty on the brink of starvation to hard work. This plus the fact that they would not willingly leave the region to which they belonged²⁹ made it difficult for Wetmore to obtain the numbers that were required. In searching for men he often traveled to the towns of the nearby interior provinces. There was no lack of men, but they were still busy harvesting the crops and therefore, "having plenty to eat, [they] feel independent."³⁰ Once employed they were considered superior to those men about Lima.³¹ With good supervision, direction, and fair treatment, they would work under the toughest conditions of weather and altitude.³² However, Wetmore could not always prevent their seasonal return to the soil. This is clearly indicated in the correspondence to the Lima office, of which the following is abstracted. For the most part, all the letters were written by Wetmore, and his unique grammar, orthography, style, and punctuation have been preserved.³³

²⁹Fawcett, p. 43.

³⁰Wetmore to John G. Meiggs (Lima), Jauja, June 19, 1871 (MP "f").

³¹John G. to John Campbell (Arequipa), October 1, 1870 (MP 1, 568).

³²Fawcett, p. 76.

³³The page number refers to those of letter-book number "750."

<u>Date:</u>	<u>Page:</u>	<u>Men:</u>	<u>Comment:</u>
July 4, 1871	15	145	<u>Pachachaca</u> : snowing all over the Mountains
July 26	18	160	They come as Many as go away, Continaly changing without much increse.
July 31	21	160	as usual Keep coming and going with little or no increse in Numbers. . . .Men all in good health.
Sept. 11	36	325	I start this moment for Tarma, Jauja, and Huancayo /towns lying to the east and south of Oroya/ to buy the necessary articles to feed Men.
Sept. 26	44	230	I hear there are 150 more on the way here, and I think that as soon as the news of my feeding gets into the Province, they will come along more willingly.
Oct. 4	48	20	they Keep going away on pretext of planting their corn &c. A short time ago the pretext was the harvest, now it is the reverse. The health of men very good, the feeding goes bravely on.
Oct. 11	49	230	find it very difficult to get more All appear well satisfied with the feed and there are no complaints.
Dec. 6	63	900	The Weather continues fine in general.
Dec. 20	68	700	all goes well except that it now rains every day and according to old residents the rainy season has begun.
Dec. 26	70	270	holowday week
Jan. 4, 1872	72	420	The weather is very rainy and unsartain.
Jan. 31	89	1500	All in good health we have shower dayly but not enough to stop work and infact it is much better working now than it was in June or July on account of the ground being so much softer to work. I am in hopes to make a good show this monnth if rain lets me alone.
Feb. 13	101a	900	fiesta days

<u>Date:</u>	<u>Page:</u>	<u>Men:</u>	<u>Comment:</u>
Mar. 15	140	1900	the work is at present at 29K., Yauli is 28.500K, the work is progressing nicely, although we had very heavy rains these last days;—the health of Camp is good.—
Mar. 27	151a	950	fiestdays
May 2	170	1400	Work is going on well
May 11	171	—	<u>Yauli:</u> P.S. Men have fallen off very much on a/c of the cosecha <u>[harvest]</u> and the cold weather
May 15	173	500	most all of my shovel men has gone home for the harvest I have sent two men into the Province to hunt men with money to get them I am afraid I shall have to pay more per day to hold them here; The weathr is verry Cold here now and snow with it and that has been a tendence to drive them off.
May 30	185	—	I have very few men, at work, but have no doubt they will increase within a month, time of finishing the "Cosechas."
June 13	192	580	am sure they will au <u>[g]</u> ment within few weeks.
Aug. 7	266a	1100	The work goes on well
Aug. 28	297	1900	everything goes well
Oct. 3	373	1100	<u>Visca:</u> ———
Oct. 31	416	900	We have a great deal bad wheather, these last days.
Nov. 21	453	1700	every day are coming more.
Nov. 26	465	1800	———
Dec. 19	507	1000	though we had lately a little better weather, my men are still falling off, on account of the approaching feastdays.
Jan. 2, 1873	520	700	the weather has been again very bad.
Jan. 9	526	600	the weather is extreme bad.

Wetmore's comments, in relation to the varying number of his men, disclose that there was a close correlation between weather, planting and harvest times, the season of religious fiestas, and the number of men actively at work at any given time. Perhaps as an inducement to keep the men, Wetmore provided them with food and shelter. Previously the men had provided their own food, but evidently because of the altitude and the difficult terrain, they later were fed by the Empresa. Wetmore began feeding his men at the end of September, 1871, with a pound of corn and a pound of meat, potatoes, rice, flour, and beans all stewed together.³⁴

Wetmore had almost as much trouble getting pack animals as he did men. Horses were not suitable because they could not work in the mountains.³⁵ Of the two hundred llamas sent from Jauja, a town located south of Oroya, eight died on the way, seven were old and useless, eighty were young and could not be used for at least six months, and only one hundred fifteen were good and serviceable.³⁶ Of the fifteen mules sent from the Empresa, only thirteen arrived with packsaddles and more than half were good for nothing.³⁷

Besides trying to maintain an adequate working force of men and animals, Wetmore had to cope with many other problems, a few of which are indicated in his correspondence. One of the most serious seemed to be getting his orders for provisions, equipment, and supplies filled readily and accurately. He was sent planks of the wrong size, wheelbarrows without

³⁴Wetmore to John G., Pachachaca, September 26, 1871 (MP 750, 44).

³⁵To Keith (Lima), Pachachaca, June 29, 1871 (MP 750, 8).

³⁶To Keith, Pachachaca, August 16, 1871 (MP 750, 27).

³⁷To M.G. Miers (San Bartolome), Visca, October 25, 1872 (MP 750, 408).

³⁸It should be remembered that Wetmore's camp sites, Pachachaca, Yauli, and Visca, were on the eastern side of the central cordillera and many arduous miles from the slowly advancing terminus of the track.

wheels, and the cooking stove without piping.³⁹ Wetmore was without stove coal for over three weeks and in "a great deal of discomfort."⁴⁰ And because the materials to build shelters for the Indians were delayed, the workers were lying in the rain.⁴¹

Sometimes construction was delayed because the equipment and supplies had not been received. Wetmore had quite a bit of rock work and always was short of powder. Many letters contain requisitions for the explosive. The two thousand barrels of powder ordered on June third still had not been received by August twenty-third.⁴² Wetmore believed that the only way to get his goods was for the supply depot to send an honest man to accompany the materials to the end of the track "as otherwise they take our material &c for the other Camps there and we are left for a future occasion."⁴³ Prompted by Wetmore's many complaints, John G. wrote the supply depot that Wetmore's orders were of the utmost importance and to

Please dispatch these with all possible speed as well as all future articles ordered from the other end of the Line, and when sending goods on Mr. Wetmore's requisitions, please always advise Mr. Dubois of shipment, so that they may be forwarded from end of track without delay.⁴⁴

Unfortunately, supplies still were delayed or inadequate, necessitating the stoppage of construction and additional complaints:

I have 240 men only, of which there are 40 miners. Consequently I am using a great deal of Powder, and have now only 50 Kegs left, therefore I beg you will send me some as soon as

³⁹Wetmore by Naters to Keith, Pachachaca, June 18+29, (MP 750, 1+9).

⁴⁰Wetmore to Merrit (San Bartolome), Visca, January 4, 1873 (MP 750, 523).

⁴¹To Chandler (Rio Seco), Pachachaca, February 1, 1872 (MP 750, 95).

⁴²To John G. (Lima), Pachachaca, August 23, 1871 (MP 750, 29).

⁴³Wetmore by Naters to Keith (Lima), Pachachaca, August 27, 1871 (MP 750, 32).

⁴⁴John G. to H.H. Heath (Monserrate), September 14, 1871 (MP 510, 128).

possible, it is not only the Miners that use so much, but I often have to undermine difficult places, so as to burst an opening, or remove large rocks, also I am very much in need of the mine I asked for on the 26th of September.⁴⁵

The mine finally arrived but with only 150 wires, which was very little since Wetmore had between eighty and one hundred blasts a day. He immediately requisitioned more with a postscript to "Hurry up any Powder."⁴⁶ Wetmore even had problems when he sent his own men and mules to fetch supplies. His men waited two days in vain at the depot at Rio Seco, a point well down on the western side of the summit.⁴⁷ Wetmore finally received more powder, but "several barrels were entirely empty."⁴⁸

At various times Wetmore asked for skilled men to replace those who were resigning, for example, the camp doctor who had difficulty in acclimating to the altitude.⁴⁹ Wetmore reminded John G. of his approaching need for a resident physician—"it is very necessary to have a Doctor here, as daily something may happen on the works."⁵⁰ Because of the altitude, no doubt, there was less sickness, but Wetmore had his share of accidents.

"Am sorry to say that 3 men were blown up while I was in Lima, one of which has since died, the above was caused by their own carelessness in discharging a blast, not using water in drawing it, after having been ordered to do so."⁵¹ In May, 1872, Wetmore informed the Lima office of the death of his chiefmason. "He died on Saturday last in Milpo, where he was working;—the 'piscante' boulder? fell on top of him and killed him instantly."⁵² The

⁴⁵To John G., Pachachaca, October 25, 1871 (MP 750, 52).

⁴⁶To John G., Pachachaca, November 1, 1871 (MP 750, 55).

⁴⁷To John G., Pachachaca, March 20, 1872 (MP 750, 144).

⁴⁸To John G., Yauli, August 7, 1872 (MP 750, 266a).

⁴⁹To John G., Yauli, July 17, 1872 (MP 750, 232).

⁵⁰To John G., Yauli, August 7, 1872 (MP 750, 266a).

⁵¹To John G., Pachachaca, November 22, 1871 (MP 750, 58).

⁵²To John G., Pachachaca, May 2, 1872 (MP 750, 170).

following August he reported that "my chief man, Mr. J. Trapnell, got his foot hurt, the Doctor took it off."⁵³ A week later Mr. Trapnell was still very weak and it appeared to be a case of "quien sabe."⁵⁴ In September Mr. Trapnell was "getting better every day" but "the other Doctor has not arrived as yet."⁵⁵ Finally the new Doctor with all his family arrived at the same time that "one man get his liggs brake."⁵⁶ Next, Mr. Wetmore fell with his horse and badly bruised his shoulder.⁵⁷

Considering everything—maintaining the labor force of men and animals, begging the Lima office for the ever delayed supplies, lacking always a sufficient amount of powder, carrying on amid sickness and accidents, and coping with the extremes of weather and altitude—Wetmore had a rough time. Yet his trials did not end. In a letter to Wetmore, John G. informed him that his pay clerk, a Mr. Naten, had "resigned." His accounts are very irregular to speak gently, and in one case, the altering of the receipt from S/7.30 ct to 70 30 ct looks very bad for him."⁵⁸ Wetmore was asked who was then his cashier, to which he replied:

As for a bookkeeper or Cashier I have none nor can I get a man here that I dare trust the Keys of the safe to. So I have to attend to office work from 6 to 8 A.M. and then am in the field to 5 P.M. and tend to office work to 9 P.M. and I am in hope you will be able to send me a good man for that birth as soon as Possible. As for Pablo Lion it was his own tong that caused his discharge he went telling all around that I cald him a theff wich was falce and he know it I told him it lay

⁵³To W.H. Cilley (Lima), Yauli, August 28, 1872 (MP 750, 297).

⁵⁴To John G., Yauli, September 5, 1872 (MP 750, 313).

⁵⁵To John G., Visca, September 10, 1872 (MP 750, 317).

⁵⁶To Henry Meiggs (Lima), Visca, September 13, 1872 (MP 750, 323).

⁵⁷Jacob Oehlmann to William Best (Galera), Visca, September 18, 1872 (MP 750, 337).

⁵⁸John G. To Wetmore (Pachachaca), Lima, January 22, 1872 (MP 5, 443-443a).

between him Adams & Waters and which I could not tell at that time so he made a great splurge and said to much and was discharged for his talk by Mr. Barkley.⁵⁹

Satisfied as to the honesty and trustworthiness of Mr. Leon and not knowing all the circumstances surrounding the difficulties between Mr. Adams, Water, and Leon, John G. could not help sending Leon back to Wetmore's camp. He reminded Wetmore that "you know natives will talk, particularly when they feel sure they have a right to do so; and I am satisfied he was not further to blame."⁶⁰ Later John G. sent Mr. Jacob Oehlmann to be Wetmore's office assistant.⁶¹

Wetmore was forced to discharge workers for repeated offences of drunkenness. Sometimes he permitted their return to the camp. Discharged for drunkenness, Mr. Manuel A. Dodds had asked to rejoin the crew, to which Wetmore replied: "If you will promise Mr. J. G. Meiggs or Mr. Cilley that you will mind what I say and keep clear of Drink there is a place here as long as you want to stay but I assure you the first time I ketch you in licuor off you go for good."⁶² Wetmore even gave Mr. Jacob Oehlmann a second chance after reporting of his behavior to John G.:

And am verry /sorry/ to say Mr. J. Olhman did not answer you about the loss of the S/5000 he was verry carles in not tending to his business and has been so for the last three weeks what with liquar and falling in love with my house keeper a woman that has been marr/i/ed three times an English woaman, and the fool is so crake he doe not know what he has been about, and I find in his Cash accounts of the mounth of April S/131 short in turning the Cash over to me love has been the cause with licuar hear after I will not let the keys

⁵⁹To John G., Pachachaca, January 25, 1872 (MP 750, 443-443a)

⁶⁰John G. to Wetmore (Yauli), January 26, 1872 (MP 5, 467) and Henry Meiggs by John A. Horn to Wetmore (Pachachaca), January 29, 1872 (MP Blur, 206-207).

⁶¹Horn to Wetmore (Pachachaca), February 5, 1872 (MP Blur, 221-223).

⁶²Wetmore to Dodds (Lima), Yauli, May 15, 1872 (MP 750, 176).

out of my hands again to any one [un]les he goes to Lima to take the mounths accounts to the office and to get things for his [marriage] he had better stay there is my advice to him and let her alone he owes me for his board for the last three mounths never paid a Cent of board since he has been over here, and has drawn all his money that is due him up to the first of May and S/40 a head on this month so you can judge for your self what is best to do.⁶³

Unfortunately, Oehlmann didn't mend his ways and later was discharged "for drunkenness and insulting language" after having been pardoned twice. "Under no consideration whatever" would Wetmore have him in his camp again.⁶⁴

A dilemma that Wetmore had continually was the scarcity of hard money with which to pay the laborers. Frequently he requested the Lima office for silver and small bills to be included with the funds for the payroll and informed them that he wrote bills of exchange for that purpose.⁶⁵ One letter informed the home office that Wetmore was returning eleven empty money boxes, hoping that more silver coins would be sent him.⁶⁶ Another letter asked to "Please have the kindness and send me in the future with every money remittance at least 1000 soles in 2 real pieces [one "real" was roughly equivalent to ten cents American⁷; I have always great trouble to get it."⁶⁷

For a time Wetmore was able to employ laborers for less than eighty "centavoes" (roughly equivalent to an American cent) per day.⁶⁸ But in

⁶³Wetmore to John G., Yauli, May 10, 1872 (MP 750, 742-743). It is interesting to note that this letter was found on the very last pages of the copy-book, consequently out of chronological order. Evidently Wetmore recorded it here, hoping that it would be unnoticed by his office staff.

⁶⁴To John G., Visca, November 30, 1872 (MP 750, 477).

⁶⁵To John G., Tarma, June 13, 1871 (MP "f") and Pachachaca, July 31, 1871 and February 15, 1872 (MP 750, 21 and 103).

⁶⁶To J.C. Cotters (Lima), Pachachaca, January 29, 1872 (MP 750, 88)

⁶⁷To John G., Pachachaca, March 27, 1872 (MP 750, 151a).

⁶⁸To Keith (Lima), Pachachaca, June 29, 1871 (MP 750, 9).

order to maintain the necessary number of men, he shortly had to increase their wages.⁶⁹ He was forced to further increase the wages by a Mr. Monier who was in charge of a work crew farther up toward the summit.

Said gentleman sends commissioners over here to take my men away, by offering them more wages and in order to keep my men, I had also to raise their wages;—to common shovelers I have to pay 12 rs [reals] a day, instead of 1 sol and to Miners from 10 to 12 soles, instead of 8 to 10 soles a week;—I think it very⁷⁰ stupid to work against each other, as it only injures you.

At about this time, the middle of 1872, Peru was negotiating another loan and money everywhere was scarce. This scarcity eventually had its effect on the railroad construction. Consequently Wetmore reported:

On Saturday evening, short before pay, I told the men, that they would not get paid, for some weeks, according the first telegraph despatch from Mr. Cilley, but as soon as I received in Sunday morning the contradicting order, from said gentleman, I at once made it known, but nevertheless a great many men, left the work.⁷¹

The next week Wetmore was ordered to reduce the wages.⁷² Four months later since the financial conditions did not improve, he was ordered to close his Visca camp and send all his cash, tools, and material to Mr. William Wiseman's summit camp at Galera.⁷³ Mr. Wiseman was informed of these orders and asked to "please reduce your force to those required for working on the tunnel and keep it at that limit."⁷⁴

Even the closing of the Visca camp was attended with difficulties. Indians had been sent up from San Bartolome with mules to help with the removal of supplies, but without notice, they left with all their mules before

⁶⁹To Henry Meiggs (Lima), Pachachaca, August 16, 1871 (MP 750, 25)

⁷⁰To John G., Yauli, July 31, 1872 (MP 750, 250-251).

⁷¹To John G., Yauli, July 31, 1872 (MP 750, 250).

⁷²To W.H. Cilley (Lima), Yauli, August 12, 1872 (MP 750, 271).

⁷³To Wm. Wiseman (Galera), Visca, January 20, 1873 (MP 750, 529).

⁷⁴John G. to Wiseman, February 10, 1873 (MP 8, 433).

the work was finished. Therefore, Wetmore had to make a final request that sixty or seventy mules should be sent immediately with some reliable Indians to whom you will please give strict orders, not to leave, until everything is removed to Galera, which will take us about 8 days.

It is extreme^{ly} provoking, to be left without any mules after having received repeated orders, from both Sr. John G. Meiggs, as well as Sr. Cilley,⁷⁵ to hurry the removal of material and tools as much as possible.

These letters of Wetmore, who was grading on the eastern side of the summit, are illustrative of the numerous Rimac canyon work camps whose correspondence, unfortunately, does not remain. The general atmosphere, no doubt, was the same with the exception of the unique problems arising from the employment of primarily Chileans and Chinese. Because of the more difficult terrain in the Rimac canyon, fatal accidents were more common. Ill health was also more prevalent.

From the references to the Oroya line and to the problems of railroad construction, in general, in the company papers, the difficulties of the Empresa revolved around four major areas: laborers, sickness and accidents, supplies, and personnel—just as Wetmore's had done.

There was always the shortage of laborers and the consequent search for them—in Chile, in China, and in the mountains.⁷⁶ Some Chileans and Chinese left their countries (in not altogether pleasant manners), but the Peruvian Indian even was reluctant to leave his province. Venturing so far away from their homes to work on the Oroya line with its verrugas was for the provincial Indians a journey to sure death.⁷⁷ Those who did come, could not

⁷⁵Wetmore by Reiffo to Miers (San Bartolome), Visca, February 11, 1873 (MP 750, 580).

⁷⁶Meiggs was approached with schemes for introducing European laborers, but evidently he disregarded them. See the letters from C. Pedro J. Gavard, Lima, January 22, 1872 (MP "g") and Wellington & Black, New York Italian Labor Company, October 16, 1874 (MP "j").

⁷⁷From Benito Arana, Huari, September 15, 1870 (MP "a") and from William H. Dow, Ica, March 20, 1872 (MP "h").

be made to take proper care of tools of any kind. "If complaint is made to them, they simply let fall whatever they have in their hands and quit."⁷⁸

Much manpower was lost due to the ill effects of Oroya fever and verrugas, soroche, and other various ailments. Due to the stubborn terrain of the Rimac canyon, there were many fatal accidents—workers being blown up by powder, crushed by falling rock, and not infrequently many miles of track and work camps were destroyed by land-slides and wash-outs.⁷⁹

Continually there were problems with the supplies; in getting them to Peru in the first place and distributing them along the various railroad lines in the second. Often they were delayed, or of poor quality or of insufficient quantity, or scarce and expensive or not to be had in the market at all. Sometimes the foreign agents failed to send them by the fastest route possible because of the extra expense and thus received an admonition such as "When I order things in a hurry I mean it. . . Please always remember that time to us, is money."⁸⁰

Being superintendent of all the railroad projects, John G.'s problems with the personnel were the multiplication of Wetmore's. He was forever plagued by drunkenness among his men and discharged many for this reason. Some made gross mistakes, involving large expenses,⁸¹ while dishonest pay clerks actually pocketed deductions from the men's wages.⁸² One was only reprimanded for being extravagant in using the printed letter-heads for every page of his monthly report,⁸³ while another was dismissed as undesirable and

⁷⁸John G. to E.W. Evans (New York), May 17, 1870 (MP 1, 251-252).

⁷⁹El Comercio (Lima), February 27, 1872, p. 3. Land-slides and wash-outs are still a menace to the Central Railway operations.

⁸⁰John G. to J.S. Spinney (New York), April 27, 1870 (MP 1, 208).

⁸¹John G. by Sherman to J.G. Hensler (Chimbote), July 31, 1873 (MP 9, 397).

⁸²John G. to Henry Meiggs (Santiago), May 26, 1870 (MP 1, 296).

⁸³John A. Horn to B.H. Fuller (Pacasmayo), October 24, 1871 (MP 1Co, 448).

inimical to good discipline for "having abused the confidence reposed in him, and having written charges against the officers of the Oroya Railway, which have upon investigation been found utterly untrue."⁸⁴ Occasionally there were differences between various line bosses, but the Lima office positively declined to interfere, because if the home office had to settle all misunderstandings, no time would be left for any other business.⁸⁵

There are scores of letters in the Meiggs Papers expressing the courtesy of Henry Meiggs and his Empresa. A variety of letters to the line officials on the railroads in progress asked that every courtesy, attention, and facility be extended to special friends of Don Enrique traveling over the lines. These friends included the British Consul, Thomas J. Hutchinson; Don Jose Maria Zavala, an artist commissioned to make sketches for Meiggs; William H. Hurlburt, one of the editors of the New York World; Fitz-Roy Cole, an English visitor who later wrote of his travels in Peru; and others. In all cases the officers and employees of the Meiggs Empresa were to furnish transportation, either by rail or animals, to give hospitality at any of the camps, and to give "every respect, consideration, and attention."⁸⁶

Often the use of the "Favorita" was put at the disposal of dignitaries, diplomats, special friends, and business associates.⁸⁷ The Favorita was a self-propelled steam inspection salon—a tiny locomotive which shared

⁸⁴ John G. to V.G. Bogue (San Mateo), June 12, 1873 (MP 9, 211).

⁸⁵ John G. by Sherman to W.J. Nash (Chimbote-Huaraz Railroad), March 5, 1874 (MP 10, 265).

⁸⁶ Henry Meiggs by Charles S. Rand to T.J. Hutchinson (Callao) and to E.C. DuBois (Mollendo), February 15, 1872 (MP 5, 578+579); John G. to J. Hamilton (Iquique), to G. Huneens (Santiago), to G. Johnson (Mollendo), and to J. Campbell (Arequipa), June 14, 1873 (MP 9, 218-221); John G. to Officers and Employees of the Oroya Railway, June 17 (MP 9, 232-233); and Cole, p. 207. Present day operations have not changed because the author also was given "every respect, consideration, and attention."

⁸⁷ From D.J. Williamson, Consulate of the United States (Callao), February 27, 1874 (MP "j"); Meiggs by Sherman to G. Petrie (Callao) and to J. Mathison (Lima), March 28 and 30, 1874 (MP 10, 323 and 324).

a frame with a small coach. The decor tended to be lavish on both sections of the whole. It took four men to run it—engineer, fireman, conductor, and brakeman. The 1,425 cubic foot engine was a Rogers Forney⁸⁸ costing, exclusive of freight to Peru, \$11,000 in United States currency. John G. stated that it was a very useful engine on the Oroya Road, saving the use of a train "hundreds of times."⁸⁹

Various courtesies were extended to employees, such as reductions in fares over the lines, and on passage to and from Peru after the employee had been with the company more than two years.⁹⁰ Employees' mail was more certain of reaching its destination being forwarded through the Empresa, and a portion of one's salary could be sent to relatives outside Peru. Also employees who were severely hurt on the line were usually found another job within the office as, in the case of Wetmore's Mr. Trapnell who had lost his foot at Visca.⁹¹ Don Enrique wrote many letters of recommendation for his capable and faithful men.

The Lima office often acted as a link between Don Enrique's men and their distant relatives. John G. quieted the worries of one mother about her son with the following note:

it affords me pleasure to inform you that, at last accounts, your Son Frederic was enjoying excellent health.

The place where he is now employed—called Matucana,⁹² possesses a delightful climate, so much so, that, invalids go there from here and derive great benefit from the change.

⁸⁸Fawcett, pp. 307-308.

⁸⁹Henry Meiggs by John G. to John Slater (Concepcion, Chile), August 8, 1874 (MP 11, 133).

⁹⁰Meiggs also had reciprocal freight reduction privileges among his business associates. See the letter of John G. by Sherman to Jacob Backus (Pacasmayo), December 31, 1874, concerning the National Company of Steamers. (MP 11, 398).

⁹¹John G. to Wetmore (Visca), November 25, 1872 (MP 8, 98).

⁹²Matucana, located fifty-seven miles from Lima at an altitude of 7,840 feet, is slightly above the area which fell prey to Oroya fever and verrugas.

You may be glad to know that I consider your Son as one of my most faithful & reliable assistants, and his conscientious discharge of his duties is not overlooked.⁹³

Another employee, a Joseph White, was informed that Meiggs had written his relatives who evidently were not receiving his frequent letters. White immediately wrote his employer to "Please accept my most sincere thanks for having written [my relatives]—it will be the means of abating all uneasiness concerning me."⁹⁴

The relatives outside Peru were informed of the demise of their loved ones by the Lima office and were sent any remaining salary and personal effects. Close contact was kept with the English and United States Consuls to readily do this. Meiggs oftentimes counseled against the removal of the remains from Peru because of the trouble and expense involved.⁹⁵ In one instance, considerable correspondence with the relatives was occasioned to attend to formalities so that the requirements of an insurance company could be satisfied and the widow could receive the monetary value of the clothing left by the deceased.⁹⁶ In another instance, it required two letters in order to sell shares of an investment left by the deceased to the best advantage of his heirs.⁹⁷

One unfortunate lady from the United States, Anna Rosa Heath, was living with her husband in Peru. Within a few weeks, she lost both her husband and his brother, who had also been in Peru. Consequently she was left

⁹³Henry Meiggs by John G. to Mrs. H.A. Merritt (Oakland, California), May 11, 1874 (MP 10, 391).

⁹⁴From Joseph White, C.E. (Camp Yuracpampa, Chimbote & Huarez Railroad), May 7, 1874 (MP "j").

⁹⁵Henry Meiggs to Mrs. Daniel Fraser (Napa City, California), May 5, 1874 (MP 10, 374).

⁹⁶John G. to Mrs. Ann Kerr (Brooklyn), August-February, 1873-1874 (MP 9, 485, 501-502, 532; MP 10, 193 and 235).

⁹⁷John G. to George Upton (Salem, Mass.), October 27, 1874 and December 23, 1875 (MP 11, 284-285, 733).

"quite alone and destitute." From the time of her bereavement, she had been staying at the home of a Meiggs relative and had been seriously ill. Meiggs wrote letters to the United States in order to locate her family because she had no future in Peru.⁹⁸

It is presumed that the adage—sow sympathy, reap dollars—was a favorite of Meiggs, and that in it is found the explanation of much of his open-handed charity.⁹⁹ Don Enrique's men knew him to be a sentimentally generous father type and appealed to him when in trouble—financial or otherwise. Many such letters and their subsequent "thank-you" notes are found in the letter bundles. A resume of Don Enrique's philanthropy would be too lengthy for presentation here,¹⁰⁰ but attention is drawn to a few letters which solicited such open-handedness.

One such was a request for a helping hand from the Overland Monthly which in its August, 1871, issue contained a sketch of Meiggs. They approached him in this manner:

Your enterprises have and are opening vast regions of comparatively unknown territory, and articles about there we expect from time to time to incorporate into our well spoken of magazine. So far as we are aware but few copies find their way to your section of the world, and, to encourage us in an undertaking which we reluctantly admit has not yet attained a paying point, we commend it to your kind consideration, asking, as an old San Franciscan and one whose great resources would allow it, a substantial recognition of its undoubted merits.¹⁰¹

A note on the letter read, "answered October 21, 1871, enclosing Draft on San Francisco for \$1000 United States Gold."

⁹⁸ John G. to C.C. Fulton, Baltimore American Office (Baltimore) and S.A. Sheppard (Visalia, California) November 20, 1874 (MP 11, 335 and 336).

⁹⁹ Stewart, pp. 39 and 255.

¹⁰⁰ Fawcett, p. 43. See also Stewart's biography for a resume of Meiggs's philanthropy, pp. 251-255.

¹⁰¹ From John P. Carmany & Company, Publishers & Proprietors (San Francisco), August 1, 1871 (MP "b").

Notes on letters from Chile requesting money for different schools are these: "Take two Scholarships and arrange with Watson and Meiggs—I will write Watson and Meiggs accordingly—answered September 16, 1871, @ \$500.00" and "draft on Ossan Company for \$250.00—answered February 14, 1872."¹⁰² On another letter from a woman in Nevada who wrote lengthily of a friend in need is this note of Don Enrique: "She is a good girl—Tell her so in carinosos words & say that I have had the pleasure of satisfying her friend—answered March 8, 1872."¹⁰³

There are numerous letters requesting loans or out-right gifts of money from complete strangers. Often these letters were answered, sometimes with money, and sometimes without.

Other more personal letters were found addressed to Don Enrique from friends in the United States, Europe, and South America. Shortly before his departure from Peru, the United States Envoy, having received a compliment from Meiggs, remarked that "a compliment coming from you who have done so much for the welfare and progress of humanity is one that I shall never forget, and I feel assured that your future will be as brilliant as has been your past."¹⁰⁴ An old friend in California reported that Henry's portrait was hanging upon the walls at Pioneer Hall,¹⁰⁵ and that upon seeing it a young gentleman from Lima cried, "Ah! Don Enrique!! Don Enrique!!" and went off in "most voluble Spanish. . .the sight of your portrait carried him off his English feet—so to speak—so rapidly that he galloped in Spanish."¹⁰⁶

¹⁰²From F. Trumbull, (Valparaiso), August 15, 1871 (MP "f") and from J.M.Y. Guzman (Santiago), January 11, 1872 (MP "h"). Watson and Meiggs in Valparaiso and Ossan Company in Santiago were among Don Enrique's business associates in Chile.

¹⁰³From J. Downing (Virginia City, Nevada), January 1, 1872 (MP "g").

¹⁰⁴From A.P. Hovey, Legation of the United States of America (Lima), September 9, 1870 (MP "o").

¹⁰⁵From Smyth Clark (San Francisco), November 3, 1870 (MP "b").

¹⁰⁶From Henry Potter (San Francisco), September 16, 1873 (MP "b").

Another friend traveling in Chile was "faring so royally" at Meiggs's home in Santiago with Henry's son, Manfred and his family, making the friend's stay very pleasant, that the friend wrote to Don Enrique in Lima: "If this were my house & grounds—I would try hard to stay with it—or take it with me—if business required me to live in other places. I think you are foregoing much pleasure that you must enjoy keenly when living here."¹⁰⁷

A young lady, formerly of Lima, wrote Meiggs from Brooklyn thanking him for letters expressing his kind sympathy on the death of her father. She probably stated what most people who had come to know Don Enrique might. She thanked God that:

in our affliction he has left us good friends who feel for us. I hope that you do not think me ungrateful or that my troubles have made me forget my darling father's dearest friend and I was going to say our second father to whom we shall always be grateful for his many acts of kindness and friendship and to whom we shall always give our respect and affection.¹⁰⁸

¹⁰⁷From John McGee (Quinta Meiggs, Santiago), November 18, 1873 (MP "g"). See the description of the Meiggs mansion in Stewart, pp. 33-37.

¹⁰⁸From Elena Thorne de La Torre Bueno (Brooklyn), March 30, 1877 (MP "i").

CHAPTER IV

THE CENTRAL RAILWAY—THE PERUVIAN SCENE

Some Peruvian landowners were unfriendly to the construction of the Central Railway. Often the right of way had to be purchased at a cost very much beyond the value of the land. By the terms of the contract the government conceded to the contractor, gratuitously, public lands necessary for the right of way. The acquisition of private citizens' land would be expedited by the government but paid for by the contractor as would any damages suffered by private persons.¹ Immediately upon commencement of the Central Railway construction, land troubles were encountered. The government facilitated matters by passing a decree designed to speed the expropriations² and John G. let it be known that he would not submit to any exorbitant damages.³

Clear title to the right of way between Callao and Lima had already been secured,⁴ but the owner of an estate called Vicentilo, five miles above Lima, was resisting. John G. said that the owner, a Mr. Marou, was "disposed to grab. I shall not submit to anything wrong, but shall deposit \$/50,000 and fight!!"⁵ Construction was continuing with the grade finished seven

¹Montgomery, p. 461. See the terms of the contract, above, p. 12.

²John G. to Hill (Mollendo), March 12, 1870 (MP 1, 64a).

³John G. to Henry Meiggs (Santiago), April 10, 1870 (MP 1, 148).

⁴John G. to Hill (Mollendo), March 20, 1870 (MP 1, 81).

⁵John G. to Henry Meiggs (Santiago), April 26, 1870 (MP 1, 201).

miles beyond Lima except for one thousand meters of heavy work through the Vicentilo Estate.⁶ John G. had tried to arrange the matter amicably with Mr. Marou, but Marou claimed that his estate was ruined and demanded S/80,000 for damages. John G. estimated the damages as no more than any of the other estates through which the right of way had passed. After a personal inspection, John G. could say "positively that Marou suffers less than many others who have made no pretensions." Unfortunately, an agreement could not be reached. Marou obtained a court order to stop the work. Consequently, John G. applied to the government which prepared to give the railroad protection with an armed force, if necessary, and commanded the court to which Marou had applied, to commence expropriating the property.

Shortly it was discovered that Marou had made a false declaration concerning his ownership. He was, in reality, only one of many heirs and the property, with a number of mortgages against it, was in the process of settlement. John G. learned that a Mr. Ureta of Arequipa held one mortgage of over S/50,000, the same sum previously offered Marou for the right of way. Meanwhile there were rumors of preparations being made to oppose the railroad all the way to Cocachacra, about thirty-six miles from Callao. Therefore, John G. felt that the Vicentilo Estate complications "must come to a fight, as an example. . .is required to make other settlements easy."⁷ John G. heard another rumor, than an owner who admitted S/30,000 was a "fair price" for his land, would "easily make Don Enrique pay S/50,000" for the right of way. However, in connection with these "unpatriotic" landowners, John G. felt confident that with the assistance of the government "We shall beat them every time!!"⁸

⁶The facts concerning the difficulties with the Vicentilo Estate are from a letter of John G. to Henry (Santiago), May 4, 1870 (MP 1, 212-214).

⁷John G. to Henry (Santiago), April 26, 1870 (MP 1, 201).

⁸John G. to Henry (Santiago), May 4, 1870 (MP 1, 212-214). Nothing more was found in the Meiggs Papers concerning the Vicentilo Estate controversy, but it is assumed that the matter was settled in favor of Meiggs.

Another annoyance was occasioned by the management of the old Callao and Lima Railway. In 1848 an English Company had been granted a concession to build this railway which later was extended another eight miles to Chorrillos, suburb of Lima. The first train passed over the abbreviated road in 1851. The Central Railway contract permitted no public traffic between Callao and Lima until the monopoly of the earlier railway came to an end. The management of the Callao and Lima Railway objected to the immediate use by Meiggs of his own completed portion of railroad as a violation of the terms of their 1848 concession.⁹ John G. vowed to "go on with the track until the Government or the Strong arm of the law in some shape prevents me."¹⁰ The Meiggs position was that the carrying of materials for a railroad which was to extend beyond Lima would not conflict with the rights claimed by the opposing group until the Meiggs road should be opened for public use. John G. declared that the Callao and Lima Railway management had themselves used this excuse "to procure an extension of their privilege. In fact, they took four years." By this he meant that the older road had insisted successfully that its twenty-five year monopoly should be considered as extending from the date when the road was opened to the public rather than from the day when locomotives began to haul materials used in constructing it.¹¹

An ingenious method of winning his point occurred to John G. which he described to Don Enrique in the same letter in which he discussed the Vicentilo Estate controversy.¹² Having obtained clear title to the right of way, John G. assumed that "a person has a right to run a railway through his own land." However, in using this reasoning, it was necessary to "defer all estimates up to Lima, and absolutely own the road and land." Therefore,

⁹Stewart, pp. 68 and 188.

¹⁰John G. to Henry (Santiago), April 20, 1870 (MP 1, 183).

¹¹John G. to W.W. Evans (New York), April 21, 1870 (MP 1, 165).

¹²John G. to Henry (Santiago), May 4, 1870 (MP 1, 212-214).

estimates for work completed, on the basis of which periodical payments were to be made, could not be issued on the portion of the road between Callao and Lima. It was hoped, however, to "make arrangements for equivalent estimates above Lima [to be paid in advance] to compensate us for withholding those from Callao to Lima." In this way Meiggs would remain the sole owner of the road between Callao and Lima and could use it as he saw fit. In 1876 after the monopoly of the older railway expired, the Meiggs railroad between Callao and Lima was turned over to the government and opened to public traffic. This probably would not have been permitted, had Don Enrique's influence been less.¹³

By the act passed January 15, 1869, Peru negotiated for a second loan with which to build the Arequipa-Puno and the Callao-Oroya Railways. During the spring and summer of 1870, since work had already begun on these lines, Meiggs was urgently awaiting the successful emission of the bonds. John G. described the situation to Mr. D.R. Martin, probably a New York purchasing agent, asking if a settlement could be made at a later date. The Empresa was borrowing heavily and naturally would be very low on funds the first year while the bonds were being sold.¹⁴ The future soon looked brighter with the successful subscription of the bonds, but unfortunately, the Franco-Prussian War injected an element of worry and loss into Meiggs's financial life. How it affected the second installment of the bonds, John G. explained in a second letter to Martin:

Just at the present moment we are all adrift owing to the War in Europe. The Bonds for the Railways were emitted at 82 $\frac{1}{2}$ % which was an excellent price. The first installment of 17 $\frac{1}{2}$ % was pretty generally paid but the second of 15% due 15' Augt has not, and will not be paid, owing to the "stay law" passed by the Legislature of France granting 30 days grace to all debtors, and which term we fear very much may be extended. In

¹³ Stewart, p. 189; Fawcett, p. 193.

¹⁴ John G. to D.R. Martin (New York), May 20, 1870 (MP 1, 254-255).

the meanwhile the Bonds have fallen say 10% and are only nominally quoted at that depreciation All of these events keep us short, as we had made conditional arrangements which in ordinary events would have made us easy—¹⁵

William Herrick, John G.'s brother-in-law in Oswego, New York, was told more candidly that the war was playing "the devil with us temporarily, but I hope the cursed thing will soon be ended, and that the man who started it will be without a place to live— We are all well, full of hope, full of vim, and with God's blessing we hope to be full of cash in the end."¹⁶ To another New Yorker he wrote, "I hope the next mail will bring us news of the final close of the Career of Napoleon No 4 [sic] He has cost us at least a million, and if I had him here he would get choked—"¹⁷ The financial worries continued, compounded by the death of Mr. John Freundt, Meiggs's agent in London. The suddenness of his death prevented the transfer of Don Enrique's power of attorney to another person, consequently all shipments had been stopped.¹⁸ The knowledge of Freundt's death coincided with the sudden death of John G.'s daughter and further complications caused by the Franco-Prussian War. The August installment of the bonds had not yet been paid, and Dreyfus was confined to Paris by the siege of the Prussians.¹⁹

While the war was affecting his commercial and financial affairs, and while the Peruvians, much agitated over the Dreyfus contracts, were arguing over the loans,²⁰ Meiggs was trying desperately to continue with the railroad construction. He appointed Mr. F.M. Schwarz as his new London power of attorney, and informed his other agents, Lockhart and Tozer, that

¹⁵John G. To D.R. Martin (New York), September 20, 1870 (MP 1, 542).

¹⁶John G. to W.H. Herrick, September 20, 1870 (MP 1, 545).

¹⁷John G. to Edward A. Jarvis, September 20, 1870 (MP 1, 547).

¹⁸John G. to Campbell (Arequipa), October 10, 1870 (MP 1, 580-581)

¹⁹John G. to Thorndike (Arequipa), October 10, 1870 (MP 1, 584).

²⁰See Levin, pp. 104-105 and Stewart, p. 268.

he had requested Mr. Schwarz to employ them as brokers. Meiggs indicated that it would have afforded him great pleasure to have appointed their firm as power of attorney, "but you know there are 'wheels within wheels,' and I have found it inconvenient to do so."²¹ Mr. Tozer acknowledged Meiggs's decision in a November letter which expressed some concern about Dreyfus.

It seems as though the position you desired for us and for Mr. Schwarz might be upset by the determination of Mr. Dreyfus— We devoutly hope that you will not be necessitated to any such action— Our previous experience of Bankers consciences—and a reviewal of Mr. Dreyfus conduct to poor Freundt & subsequently, does not encourage us in the prospect of your interests being exclusively in his hands— I should think that Dreyfus had plenty to attend to of his own important Concern—. . . . Unfortunately Mr. Dreyfus is a refugee here from Paris and has time to attack this thing Meiggs's business & has boldly done so—but I am uncharitable enough to say that it is in his self interest only—which would always be his chief aim—

I can only hope that you may be able to confirm the whole position to Mr. Schwarz—who is an honorable painstaking man—but should necessity compel you to accept Mr. Dreyfus—then in your interest certainly as well as in our own, make it a condition that he employs us as heretofore & dont leave yourself unreservedly in his hands.²²

In a private letter to Meiggs, Schwarz wrote, "Mr. D seems to have immense power over Peruvian affairs and to aim at a general control, including your business."²³ This seemed to be the case—at least in respect to Peruvian affairs, as the following uneasy financial years confirmed. Tozer reported in December that trade had been much paralyzed by the "Wretched dreadful War which still goes on badly as Ever & no signs of its termination!!!" He

²¹Henry Meiggs to Lockhart and Tozer (Liverpool), October 13, 1870 (MP 1, 590-591).

²²From James H. Tozer, London, November 17, 1870 (MP "b").

²³From F. M. Schwarz, London, December 31, 1870 (MP "m").

continued that it was a pity that Meiggs's supply of powder, then costing £10 a ton, had not been ordered as "anyone could have foreseen that War would put up powder & put down rails."²⁴

Throughout 1870 Meiggs suffered much anxiety concerning the sale of the Peruvian bonds. He was still worried in 1871 when the sale of the bonds was affected by negotiations for another loan. The difficulties which he encountered in collecting his funds for the Central Railway and the other simultaneous railroad construction increasingly hounded him. Mr. Schwarz, in a letter addressed to Meiggs's agent in New York, reported that Meiggs had sent him a copy of a letter to Dreyfus in which Meiggs "really writes very urgently about a credit for at least £80,000 but he still treats it as a favor of Mr. Dreyfus not as a right to ask."²⁵

It seemed that Dreyfus was becoming more involved with the Meiggs Empresa. Dreyfus Brothers were probably the "wheels within wheels" that prevented Henry from appointing the firm of Lockhart and Tozer as his London power of attorney and forced the discontinuance of Schwarz acting in that capacity.²⁶ Another London agent, Mr. James Stahl, had reason to complain of Dreyfus, but did so in a letter to Meiggs's agent in Valparaiso, in which he explained the reason for shipment delays. All letters, contracts, and invoices had to be sent first to Dreyfus for signature. Naturally a great deal of extra trouble, work, and delay was occasioned. Stahl didn't think the method could be altered because "Mr. D wants to be kept well informed of everything." He was "truly sorry and ashamed to read letters in which Mr. Meiggs begged for 'God's sake' to send some Powder as soon as possible." The order for powder arrived when Europe, in the midst of war, was unsettled. Although Stahl kept pressing him, Dreyfus could not spare the money for the purchases. "The consequence was that not only much valuable time had been

²⁴From Tozer, London, December 31, 1870 (MP "b").

²⁵Copy of the letter from Schwarz, London, January 21, 1871 to Joseph Spinney (New York), (MP "m").

²⁶To Meiggs from Schwarz, London, February 16, 1871 (MP "m").

lost, but that I also had to buy afterwards in a high market, by which two unfortunate blunders, a considerable sum has been lost to Mr. Meiggs."²⁷

The Peruvian bonds of 1870 were still remarkable low due partly to the apprehension of further large loans and conflict of opinion with regards to the guano deposits.²⁸ It would be a "great financial feat" to bring out a new loan at a fair price. The London agent, Schwarz, was of the opinion that a few thousand pounds should be expended in collecting, preparing, and publishing Peruvian statistics, for example, a comparison of real estate value in and about Lima between 1850 and 1870. This would show an enormous increase of wealth and would demonstrate to the financial public that Peru could easily bear taxes for the interest and redemption of loans quite "independent of Guano." Therefore, a government loan without allusion to guano could be brought out at a fair price.²⁹

Unfortunately, the new loan of £15,000,000 was a complete failure³⁰ It was brought to the public in the early months of 1872 at 77 $\frac{1}{2}$ % and the public took only £230,000. Its poor reception was due, no doubt, to the flotation of the French loan, the Alabama claims controversy between the United States and Great Britain, and the attacks upon the Peruvian finances and public-works program.³¹ Meanwhile Dreyfus was refusing to honor orders for funds given Meiggs by the government until after the 1872 bonds should have been issued.³² The financial horizons continued to deteriorate.

²⁷From James Stahl, London, August 1, 1871 to Charles Watson (Valparaiso), (MP "m").

²⁸To Meiggs from Schwarz, London, August 1, 1871 (MP "m").

²⁹From Schwarz, December 1, 1871 (MP "m").

³⁰Between 1862 and 1875 the Peruvian sol was worth slightly less than the American dollar and about one-fifth of the English pound sterling. See above, note 14, p. 7.

³¹Stewart, p. 273.

³²John G. to Campbell (Arequipa), January 31, 1872 (MP 5, 484-485).

There was considerable agitation in the waging of the presidential campaign which culminated in the July 22nd to 27th, 1872 Gutierrez brothers' revolution, a six-day blood-bath which ousted the Balta government.³³ When order had been restored, Manuel Pardo, as the rightfully elected president, had the impossible task of bringing Peru out of its financial chaos. The future of Meiggs, who was courageously and optimistically continuing the construction of the railroads contracted under Balta, now was dependent on the Pardo administration's solution of Peruvian finances since the government was supposedly paying Meiggs for the construction of the many railroads. These were anxious days for Don Enrique without any more ample funds. Consequently, decisions were made to cut down expenses, to reduce wages, and to consolidate camps.³⁴ Meiggs continued to borrow heavily, mainly from Dreyfus. It is presumed that Meiggs was forced to write many letters such as the following, which referred to the settlement not yet made to the estate of the late John Freundt.

In my letter of November 13th, 1871, to which you refer, I distinctly stated the reasons for the delay in settlement, reasons which exist today in greater force: viz, that I had not received from the Peruvian Government large sums due me on contracts already taken and partially fulfilled, and would remit on securing such payments.

The indifferent success of the late Peruvian loan, and the financial needs of the Government have prevented me from satisfying many equitable claims, and until the situation shall improve,³⁵ it will not be convenient for me to remit the balance you claim.

The financial picture in 1873 remained dark. In a January letter to the Valparaiso agents, Watson and Meiggs, John G. indicated that "at the

³³See Hutchinson, II, 1-16 for an eyewitness account of much that took place during the Gutierrez brothers' revolution. See also Stewart, pp. 280-287, for a summary.

³⁴See the directions sent to Wetmore at Visca, above, p. 61.

³⁵Henry Meiggs by John G. to L. Keating (London), December 19, 1872 (MP 8, 214-215).

present moment, it is simply impossible to procure a pound."³⁶ A week later he informed them that Dreyfus refused to grant further credits on England until the following month when credits would be limited to £25,000. "We are almost in a state of 'Panic' for want of bills on England. Last mail steamer Messieurs Dreyfus Brothers had applications for more than £1,000,000 sterling and could only draw £60,000."³⁷ On February twelfth, John G. directed the Valparaiso commercial house to discontinue all shipments for the time being, since exchange for making payment could not be had. He repeated this direction on March fifth, because the future was "more clouded than ever."³⁸

Shortly after gaining office, Pardo instituted a program of domestic reform. Three of the measures were municipal decentralization aimed at developing civil responsibility and a possible increase in local taxes; an export tax on the fast-growing nitrate industry in the southern desert; and an increase in the customs duties. Of these, only the higher tariff yielded appreciable results. The Peruvian finances, however, remained in a critical state. Pardo, who had been strongly opposed to the original Dreyfus contract, wished to relieve the country of the Frenchman's hold. He was faced with the alternatives of either suspending at once the work on the railroads or of continuing the efforts to procure funds for their completion. The former was politically unwise because during the years of unlimited expenditures, the people were taught to associate their happiness and well-being with the construction of railroads. A suspension was economically and socially unwise because it would discontinue the wages of some twenty thousand people employed on the works and would cause the cessation of the importation of construction material and the dislocation of many associated

³⁶John G. to Watson and Meiggs (Valparaiso), January 15, 1873 (MP 8, 337).

³⁷January 22, 1873 (MP 8, 366-367).

³⁸(MP 8, 449 and 519).

activities. This would result in an immediate and exceedingly grave industrial and commercial crisis from which would stem a social crisis and possibly another revolution.³⁹

Harassed by relentless political opposition, embarrassed by frequent riots, and convinced that the welfare of the country demanded the completion of the railroads, Pardo, with no funds, was forced to negotiate with Dreyfus. This time, however, provisions were made to lessen and ultimately to eliminate the influence of this powerful French commercial house. On April 15, 1874, another contract was signed whereby Dreyfus would meet the semiannual interest charges on the foreign debt for three semesters— July 1, 1874; January 1, 1875; and July 1, 1875. After the later date, the government was authorized to export, or to permit others to export, guano to all markets in order to pay the interest on the foreign debt itself. Dreyfus's unexported portion of the two million tons of guano, contracted for in 1869, was set at eight hundred fifty thousand tons. This left a balance of seven million soles to be paid the government in four hundred thousand—sol monthly installments. An important clause in the contract was the setting of a time limit to the previously unlimited Dreyfus monopoly in guano sales. Nevertheless, little advantage came to the Peruvian government from the return to the consignment system. The guano deposits were nearly exhausted and of poor quality. In the markets there was competition; the nitrates with the guano and Dreyfus with the consignees. Therefore, the price of guano declined rapidly.⁴⁰

In 1874 and 1875, the Peruvian nation passed through a dilemma with four primary aspects: a guano crisis, a fiscal crisis, a banking and credit crisis, and a monetary crisis. The whole was the manifestation of the impending collapse of the long-sustained guano boom. The guano crisis was caused by smaller shipments and lower prices, resulting from overproduction and competition of other fertilizers. The fiscal crisis was brought on

³⁹Stewart, pp. 292, 298-299. ⁴⁰Ibid., pp. 300-302.

chiefly because of the absorption of public revenues by the interest of the foreign debt. The banking and credit crisis was the result of the drain of public expenditures (for the public-works program and the interest of the foreign debt) on the supply of local capital. The monetary crisis was due to the flow abroad of silver money, exported when the exchange market could not furnish the necessary bills. These were the resulting complications of the railway fever which Pardo attempted to cure.⁴¹

In the middle of April, 1874, Meiggs was unable to secure funds to meet the monthly payroll.⁴² Continued reduction of the construction forces was ordered to be done without alarming the people.⁴³ Abstracts from his letters aptly described the lamentable conditions.

To John F. Mines, New York, May 12, 1874

I regret that I can say nothing that would tend to encourage you to come here. . . the effect of the financial troubles which this Government has been suffering under for the past year & more, has been to unsettle all kinds of business and to render the future lamentably uncertain for a long time. . .
(Henry Meiggs by John G., MP 10, 392).

To R.A. Babbage, Buenos Ayres, May 12, 1874

I regret that I can say nothing likely to encourage you to come here. Business is almost paralyzed and among the results of the terrible financial crisis through which we have not yet passed, are the complete failures of the mercantile houses heretofore considered as the strongest.

The Railroads, with one exception, are going on it is true, but at a snail's pace, and many of our best men are idle.

(Henry Meiggs by John G., MP 10, 393).

A third letter written toward the end of 1874, was more succinct. It read, "Money is tight, work is scarce and goes slow, and many of my best men are idle waiting for a renewal in business."⁴⁴

⁴¹McQueen, p. 95.

⁴²Henry Meiggs by Charles Rand to Captain Samuel Kissam (Callao), April 16, 1874 (MP Green, 426).

⁴³Henry Meiggs to S.H. Mayers (Arequipa), April 15, 1874 (MP 10, 344)

⁴⁴Henry Meiggs by John G. to Jack Wrightman (Albany, New York), October 5, 1874 (MP 11, 242).

There was no relief from financial distress. The Peruvian Congress on May 28, 1874, authorized the flotation of another loan of S/15,000,000. Buyers of the bonds were so scarce as to be practically nonexistent. The loan could not be effected. The government then issued S/10,000,000 in Treasury Bonds—a form of paper money—to cover the floating debt, but this form of money could not be utilized in making purchases abroad.⁴⁵

On the day after Christmas, revealing some discouragement—a rare mood with Don Enrique—he wrote to his son in Santiago.

I have never in my life been so busy nor have I ever in Peru seen such tremendous hard times— You cannot imagine the difficulties we are laboring under. The absence of the President makes it impossible to do anything, or to calculate with any certainty for the future.

I hope that peace will soon be declared and that the President will return to his post— We are suffering too much on a/c of his prolonged absence.

. . . I passed a frightfully triste Pascua [sad Christmas], such as I have no desire again I need not, nor can I explain the cause fully Suffice it to say that I had not yesterday, nor can I have today, a moment of enjoyment

I assure you my dear son that the world goes hard with me.⁴⁶

President Pardo's extended absence from Lima and the lack of peace to which Meiggs made reference were caused by an attempt, headed by Nicolas de Pierola, to overthrow the government. Pierola's unsuccessful "Talisman affair," one of several uprisings occurring in 1873 and 1874, was put down by prompt action. It embarrassed the administration, muddied the already cloudy waters of Peruvian politics, and occasioned a serious depletion of the already overstrained resources of the near-bankrupt country.⁴⁷

⁴⁵ Stewart, p. 305.

⁴⁶ Henry Meiggs to Manfred Meiggs (Santiago), Lima, December 26, 1874 (Valle-Riestra Family Papers) as quoted in Stewart, p. 303.

⁴⁷ Stewart, pp. 303-304; Dennis, pp. 84-85.

In June, 1875, Peru wished to negotiate another loan, but her credit was gone. Default on the interest charges of the already enormous foreign debt was imminent. The metallic exchange was exhausted. It was impossible for Don Enrique to pay for materials or to meet the payrolls. No course was left but to suspend building operations on the railroads. This was done by order of the government on August 13, 1875.⁴⁸

The discontinuance of operations and the remote prospect of an early renewal led to the resignation of John G. Meiggs as Don Enrique's general superintendent. John G., with his family, left Lima late in December. His successor in the Lima post was Charles Horsfall Watson, former member of the firm of Watson and Meiggs, merchants at Valparaiso.⁴⁹ With John G.'s withdrawal from Peru, Don Enrique lost, at a time of crisis, one who had been a most capable business manager and an invaluable collaborator.

During 1876 and 1877, Meiggs used every possible means to obtain money for the resumption of work on the paralyzed railroads. He had earlier (March, 1874) organized a large concern, the Public Works and Development Company, as a possible means of drawing money into his hands from private sources. In May, 1876, he made proposals to the government respecting the Cerro de Pasco mines and the unfinished Oroya Railway. In Don Enrique's view, the financial salvation of himself and of the nation was linked with the development of the mines. Early the next year after extended study of the proposals, the government made arrangements with Don Enrique for working Cerro de Pasco, completing the Oroya Railway, and extending it northward to the mines.⁵⁰

⁴⁸ Stewart, p. 306.

⁴⁹ See MP 11, 730 ff. for the last letters signed by John G. Meiggs and the first by Watson in their respective capacities of general superintendent of the Meiggs Empresa.

⁵⁰ Stewart, pp. 236, 314-318; also see pp. 309-327 for Meiggs's last attempts to avoid financial ruin.

It was too late. Meiggs was at the end of his resources. Only death saved him from complete financial ruin. It occurred shortly after midnight on the morning of September 30, 1877. Don Enrique died presumably of an overworked heart.⁵¹ His death left the Central Railway unfinished. Although the entire line to Oroya had been graded, rails had been laid only as far as Chicla, eighty-seven miles from the sea.

⁵¹See Stewart, pp. 328-346 for Meiggs's death and funeral.

CHAPTER V

CONCLUSION

Death saved Don Enrique from complete financial ruin. Nothing could save Peru. While the exportation of nitrate from southern Peru, used as a fertilizer or in making explosives, had been increasing since 1832, the industry had gone untaxed from 1840 to 1868. A minor duty in 1868 was followed by a heavier export tax in 1873. The government, faced with large, persistent budget deficits, in 1875 nationalized the industry. By establishing her control over the exportation of nitrates, Peru hoped to create a new revenue producer and to protect the threatened guano-sales proceeds from the competing nitrates. There was one serious deterrent in this plan, however. A new British- and Chilean-owned nitrate industry was developing in Bolivia's coastal desert near the Peruvian works. The complications arising from Peru's attempt to keep the price of the nitrates high with an export tax, and her attempt to induce Bolivia and the reluctant Chile to accept Peruvian control, resulted in diplomatic and military incidents which soon led to war, Bolivia and Peru fighting against Chile. This was the War of the Pacific, waged from 1879 to 1884. Peru and Bolivia were completely defeated, losing all their nitrate lands, and Bolivia her seacoast, to Chile. Already on the brink of bankruptcy, Peru, after this unsuccessful war, was completely impoverished.¹

¹Levin, pp. 108-109. See Dennis for a discussion of the origins of the war as well as the later history of the Tacna-Arica dispute.

On January 11, 1890, the Peruvian government concluded an agreement with its foreign bondholders, who then formed the Peruvian Corporation (March 20), completely extinguishing the foreign debt defaulted by Peru in January, 1876.² The government turned over to the corporation all 769 miles of the state railroads for a period of sixty-six years, later extended another seventeen years, and finally granted in perpetuity. The Peruvian Corporation also received the exclusive right to export two million tons of guano, an annuity of £80,000—later reduced to £60,000—for thirty-three years, five hundred thousand hectares of land in the Perene Valley, north-east of Oroya, and the franchise and government equipment for steamer operations on Lake Titicaca.³

On November 28, 1890, the Peruvian Corporation notified the government of the creation in London of a subsidiary company, called the Central Railway of Peru, which took over all obligations connected with the line.⁴ One of the company's first projects was to reconstruct the Verrugas bridge. This was done by January 3, 1891.⁵ Next, John L. Thorndike extended the road, reaching Casapalca in July, 1892, and Oroya in January, 1893. His job was relatively simple, consisting only of laying rails because Meiggs had had gangs grading the Oroya section and boring the Galera Tunnel while track

²Concerning the default of the foreign debt see William Clarke, Peru and Its Creditors (London: Ranken & Co., 1877). Clarke was in Peru from March through August, 1877, on a mission for the International Committee of Peruvian Bondholders. His objectives were four: to protest for the holders of the 1870 and 1872 bonds, to determine whether settlement arrangements could be made, to investigate the position of Dreyfus, and to report upon the resources and financial capabilities of Peru.

³McQueen, pp. 89-91.

⁴In 1956 the Peruvian Corporation along with its subsidiary company, the Central Railway of Peru, became a subsidiary of a Canadian corporation with headquarters in Toronto. Shares in the company are held by Canadian, American, and British interests. See Fawcett, pp. 157 and 325.

⁵Long, p. 212.

was being laid in the lower regions. The extension of eighty miles south of Oroya, following the Mantaro River to Huancayo, was built between 1905 and 1908.⁶ Lacking Don Enrique, the celebration which marked the completion of the Central Railway was undramatic.⁷

The engineering difficulties encountered in this unique railroad corresponded to the grade and altitude.⁸ The route to Oroya is divided by degree of difficulty into three sections. The first section, from Callao to Chosica, a distance of thirty-three miles, presented comparably few difficulties. The approximately seventy-five miles of the second section, between Chosica and slightly beyond the summit, presented the most difficulties. In this section are located the majority of the sixty-one bridges, sixty-five tunnels, and nineteen switchbacks.⁹ Rails were not laid completely throughout this section before the work was suspended. The third section, to Oroya on the eastern side of the cordillera, was less difficult than the Rimac canyon. Although rails never reached the third section, the summit tunnel was bored and the grade prepared. The extension from Oroya to Huancayo, an easier run because of the slope through the intermontane valley basins, was built after the railroad had been turned over to the Peruvian Corporation.

There are several primarily descriptive accounts of the Central Railway.¹⁰ Scarcely indicated, however, are the contrasts of the five climatic belts between Callao and Huancayo.¹¹ From the coast, passing through

⁶Fawcett, pp. 204, 214-215, 219.

⁷See Stewart, pp. 59-65, for the dramatic celebration of the inauguration of the construction of the Central Railway.

⁸See the General Plan and Profile of the Central Railway, above, p. xii.

⁹The number is obtained by counting each switch of the nine doubles and the one single.

¹⁰Montgomery's illustrated description, with plans showing the various switchbacks, is among the better.

¹¹R. De C. Ward, "Climatic Contrasts Along the Oroya Railway," *Science*, New Series VII (January 28, 1898), pp. 133-136.

Lima and up the fertile valley of the Rimac to the famous health resort at Chosica, sugar cane and cotton grow on all sides. There is a striking contrast between the fertile, irrigated Rimac valley bottom and the dry, barren hills above. This valley, previously three miles in width, compresses to a thousand-foot wide canyon. Next is a belt where fruit and flowers grow most luxuriantly. At San Bartolome, where verrugas was widespread, bananas, apricots, limes, chirimoyas, and other fruits are grown and sent to the Lima market. Flowers--roses, carnations, jasmine, violets, and many others--are prevalent around Surco, making a great variety of color and scent. In the bracing, dry climate of Matucana, palm trees grow among pine and eucalyptus. A third district, centering around San Mateo, is singularly adapted to the growth of potatoes, which are grown on terraces to considerable altitude above the valley floor. In the next region, at an altitude where nothing but grass grows, the snow line is reached. Mining is prominent in this district around Chicla, Casapalca, and beyond the summit to Oroya. South of Oroya along the Mantaro River, the valleys of the Department of Junin yield grains and cereals. The Mantaro River is surrounded by high, rolling pampas covered with rich grasses for the raising of cattle and sheep. Huancayo, the present terminus of the Central Railway, is in the center of a wide, pleasant, densely populated valley.

The facts involved in building the Central Railway tend to obscure the achievement of its operation.¹² As part of a modernization program financed by eighteen million dollars in loans from the World Bank and the Export-Import Bank, the Central Railway recently has changed from steam to diesel electric locomotives.¹³ In 1964 fifteen Alco diesels were obtained; twelve 2400 and three 1200 horse power. One of the more powerful types was almost totally destroyed when it derailed and fell into a chasm in July, 1964, with the loss of five men. Three more of the 2400 horse power locomotives

¹²See Fawcett for the present day operation of the Central Railway given throughout his work.

¹³Information about the modernization program was learned during the author's stay in Peru and through correspondence with Mr. Haydn Jenkins, Assistant Traffic Manager and Mr. Charles Gilby, Chief Stores Superintendent.

have since been acquired. The advantages of the diesels are speed, tonnage capacity, and dynamic braking. Since train size is limited by the length of the switchbacks, some are being lengthened. When this is completed, double-heading, the use of two locomotives, will be possible, resulting in increased train lengths and tonnage capacity. There is increased mineral traffic even though the recently completed surfacing of the Central Highway¹⁴ has forced a reduction in long distance passenger service to one train per day in each direction. The increase is due to the advantages of the diesel locomotives and to the ever-expanding mining industry. With dieselization two round trips per day simultaneously from Callao and Oroya to Chinchán are possible.

Though some claimed that the Central Railway might have been better planned and perhaps more cheaply built, it constituted an important addition to many aspects of Peruvian life. It provided transportation hitherto lacking for Peruvian political and economic organization. Where profitable development of sugar, cotton, and mineral products could take place, it facilitated their transport to the sea and to the world markets beyond and consequently formed the basis of the revival of these industries—all of which are expanding today.¹⁵

It brought many previously isolated regions into relatively close contact with a larger world for the first time. Although it did not wake the mountain Indian from his centuries of lethargy, as some of the planners had hoped, it did contribute much to his acculturation.¹⁶

¹⁴The Central Highway, paralleling the railroad at a lower level, was opened to traffic in 1935.

¹⁵Levin, p. 123; Thomas R. Ford, Man and Land in Peru (Gainesville: University of Florida Press, 1962), p. 137.

¹⁶For recent studies of the Peruvian Indian see Richard N. Adams, A Community in the Andes, Problems and Progress in Muquiyauyo (Seattle: University of Washington, 1959) and his "Freedom and Reform in Rural Latin America," ed. Fredrick B. Pike (Notre Dame: University of Notre Dame, 1959), pp. 203-230; and Allan R. Holmberg, "Changing Community Attitudes and Values in Peru: A Case Study in Guided Change," Social Change in Latin America Today, Its Implications for United States Policy, ed. Richard N. Adams et al (New York: Harper & Brothers, 1960), pp. 63-107.

The very high Andean railroads were not built for sightseers. They were built to transport goods, not necessarily people, over the rugged cordilleras. Of these, the highest, the grandest, the most spectacular, and at its summit level, the busiest, is the Central Railway of Peru.¹⁷

¹⁷Fawcett, p. 229.

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APPROVAL SHEET

The thesis submitted by Ann Sanford Caraher has been read and approved by three members of the Department of History.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

July 5, 1966
Date

Paul S. Lietz
Signature of Adviser 