

Interrogando A Pesquisa Histórica Sobre As Ferrovias Do Estado De São Paulo: Teorias, Métodos e Fontes

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Resumo

O ensaio faz uma reflexão sobre as contribuições teóricas, métodos e fontes documentais nos estudos sobre a implantação das ferrovias no Brasil, no século XIX. A reflexão é resultado de pesquisa de história social da transferência da tecnologia ferroviária realizada na província de São Paulo, que envolveu capitalistas, produtores rurais, especialistas e órgãos públicos para introduzir a nova tecnologia para instalação e operação desse sistema de transporte. No tocante as fontes históricas, o texto ressalta os desafios enfrentados pelos pesquisadores para localizar os documentos, relatórios e outros papéis das primeiras companhias ferroviárias. A partir dos materiais que estão disponíveis para pesquisa, indica-se as possibilidades de estudos que contemplem aspectos da técnica e da tecnologia ferroviária.

Palavras-chave: ferrovia brasileira, transferência tecnológica, história social da técnica e da tecnologia.

Abstract

Interrogating Historical Research on São Paulo State Railways: Theories, Methods And Sources

The essay reflects on the theoretical contributions, methods, and primary sources in studies on the implementation of railroads in Brazil in the nineteenth century. The reflection is the result of social history research of the transfer of railroad technology carried out in the province of São Paulo, which involved capitalists, rural producers, experts, and public officials to introduce the new technology for the installation and operation of this transport system. About historical sources, the text highlights the challenges faced by researchers to locate the documents, reports, and other papers of the first railroad companies, and indicates the possibilities for studies with the existing documentation. From the materials that are available for research, the possibilities of studies that contemplate aspects of railway technique and technology are indicated.

Keywords: Brazilian Railroads, Transfer Technology, Social History of technical and technology.

Resumen

Interrogando la investigación histórica sobre los Ferrocarriles del Estado de São Paulo: teorías, métodos y fuentes

El ensayo reflexiona sobre los aportes teóricos, métodos y fuentes documentales en los estudios sobre la implementación de los ferrocarriles en Brasil en el siglo XIX. La reflexión es el resultado de la investigación sobre la historia social de la transferencia de tecnología ferroviaria realizada en la provincia de São Paulo, que involucró a capitalistas, productores rurales, especialistas y organismos públicos para introducir la nueva tecnología para la instalación y operación de este transporte. El texto destaca los retos a los que se enfrentan los investigadores para localizar los documentos, informes y otros trabajos de las primeras empresas ferroviarias. A partir de los materiales que se encuentran disponibles para la investigación, se señalan las posibilidades de estudios que contemplen aspectos de la técnica y tecnología ferroviaria.

Palabras-chave: Ferrocarril brasileño, Transferencia de Tecnología, Historia social de la Técnica y Tecnología.

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In this review I intend to reflect upon the theories, methods and primary sources that have shaped recent research on the history of railways in Brazil. I will use my own research as a prompt to suggest important new fields and methods of inquiry for broader Brazilian mobility studies and particularly for the study of the nation's railways. My work began in 2013, supported by the Department of Science and Technology Policy at the Institute of Geosciences at State University of Campinas. The research was about the social history of the transfer of railroad technology to the province of São Paulo. It sought to understand the social actors involved in bringing the new technology for the installation and operation of this transport system. The research was supported by CAPES and was completed in 2018.

Currently, my research theme is focused on the role of railway technology in the occupation of the suburban area of the city of São Paulo, along the "Companhia São Paulo - Rio de Janeiro", a railroad line between São Paulo and Rio de Janeiro. In the 20th century, the company was incorporated into "Central do Brasil", an important public railway company. The research is supported by the Postgraduate Program of the University São Judas Tadeu, under a scholarship from Anima Institute.

The project about the transfer of railroad technology seeks to understand the creation and spread of railroad technology in the southeastern province of São Paulo during the final decades of the nineteenth century. Given that most works in Brazilian railway history have occurred at an institutional level, research that focuses on technology and expertise are sorely needed. In order to create this work, though, researchers must first have a discussion about the challenge of accessing sources for such research, consider the works that have already laid some of the groundwork, and work to come up with innovative ways to read what sources do exist against the grain in search of the role of technology.

The success of the Province of São Paulo's agro-export activities during the 1800s led to the creation of the region's first railway companies by the end of the century. Agricultural producers supported the railroad because of the speed, safety, and low cost with which they transported goods from farms to ports. However, the implementation of the railroads was a complex task that required citizens with technical knowledge and a society with a high degree of industrialization, requirements that the country – still home to legal slavery and predominantly rural in the second half of the 1800s – could not meet. Faced with such national limitations, worried farmers and their partners were forced to build up the technical knowledge railroads required through the slow accrual of railroad technology and a transfer of know-how from abroad (CAMPOS, 2012). As they created the nation's railroad network, these rail proponents also pushed for the expansion of the needed support network of secondary businesses such as repair workshops and parts manufacturers.

The first railway company organized in São Paulo was the Companhia Paulista de Estradas de Ferro (Paulista Railroad Company), in 1868. The company - which had several São Paulo farmers on its board and among its shareholders - hired a Brazilian engineer, João Ernesto Viriato de Medeiros, to construct the network². Viriato de Medeiros was given a great deal of power, including the right to choose which international manufacturers would produce the materials necessary for the rail's construction. At Viriato de Medeiros' behest, the board of the Companhia Paulista acquired the materials from England and sent Viriato de Medeiros to oversee the production operation. Viriato de Medeiros also hired the company's first set of technicians and other specialized railway workers from abroad. This foreign workforce took the lead in training their Brazilian counterparts (CAMPOS, 2012). Without the foreign laborers the company would not have succeeded due to the paucity of such skilled workers in Brazil at the time³.

² The country had an engineering school operating in the capital of the empire, the Escola Central. However, with the increase of railway companies in the country from the last decades of the nineteenth century the number of engineers available in the market was insufficient for the high demand for these professionals. In many companies' foreign professionals were hired to design the rail lines. About this see Telles (1984). The Companhia Paulista reports can be found in libraries such as the Central Library of the Polytechnic School of the University of São Paulo, São Paulo State Archive, and the Library of the FEPASA Complex, located in the city of Jundiaí. The reports are available online on the website of the Memória Ferroviária Project available at <https://memoriaferroviaria.rosana.unesp.br/> Accessed 11 Aug. 2021.

³ Indeed, almost all materials required for the construction and running of railways were imported. Even laborers and skilled workers came from abroad. See Cechin (1978), Garcia (1992) and Cunha (2005).

Companhia Paulista's history illustrates how the transfer of railroad know-how and the movement of technology between Europe and Brazil occurred during the late 1800s. Because of the complexity it entails, we must understand the transfer of technologies and technical skills as broad social processes, not simply determined by their technical aspects. While experts like engineers and mechanics played a central role in the transfer of railroad technology to Brazil, it is important to consider how social agents such as businessmen, laborers, and public officials also enabled the transfer through political and social efforts. Both the technical and social actors were required to make the import of railroad technology possible.

This viewpoint, though, is not often seen in the vast historiography of the Brazilian railways. Few works offer information on the role that social or political processes played in the growth of technologies or their attached networks. It is far more common to find analyses that focus on the minute details of a single corporation rather than on the whole socio-political ecosystem that underlies a company's operation. In these institutional approaches, the company appears as a single entity, with social actors making only select appearances in places where they cannot be avoided. As scholars strive to learn more about the transfer of knowledge and technology to Brazil, they must start to ask questions of both the major corporations and the social agents involved with their operation. When it comes to the actual act of exchanging technology, for example, who were the actors that physically brought technical equipment or expertise from one place to another? The companies benefited from such exchanges, but it is not possible to say that corporate entities did all the work. It is essential that scholars begin to complement corporate histories with primary research devoted to understanding who the social actors that helped facilitate technology transfer were and what they hoped to achieve.

In Brazil, several authors research the history of the railways from an institutional or state-level viewpoint that focuses on government policies or major companies. Much of the work of these scholars' centers on how railroads impacted the national economy or helped alter the physical configuration of cities⁴. Because the study of railroads lends itself to an interdisciplinary approach—one must combine economic history, cultural heritage, and urban development into a single study—researchers face a mountain of potential data sources. Sorting through these sources and choosing a comprehensible subject means that many of the existing studies are purposefully limited in scope. While each offers a valuable addition to the effort of understanding the implementation of the railways, none have adequately dealt with the history of technical expertise and technology in this process. In most existing literature, the technology transfer process is only mentioned briefly, forcing scholars interested in the subject to turn to underutilized primary sources to gather information about this process.

All this is not meant to suggest that works that consider Brazilian railways from the perspective of technical expertise or technology do not exist. During the 1980s and 1990s, several works on railway technologies emerged from groups of researchers interested in the larger history of technology in Brazil. Most of these studies emerged from the University of São Paulo and, to a lesser degree, the State University of Campinas. At the University of São Paulo, most of this work emerged from the Interdisciplinary Center for the History of Science and Technology and the Department of History of Architecture and Design Aesthetics. At the State University of Campinas, the Social History of Science and Technology group that emerged from the Department of Science and Technology Policy made significant theoretical contributions to the field of history of technology⁵. These groups have published several studies on the national railways, mainly from an institutional or national level, but they also discussed the techniques and technologies used by early railway companies. Marilda Nagamini (1994), a researcher from the group at the University of Sao Paulo, has made important contributions to railway studies by arguing that the successful training of engineers at the first Brazilian engineering schools was integral to the later dissemination of technical expertise around Brazil.

More than simply contributing to the historiography of technology in the country, these researchers offer a new research methodology to the field by showing that technical expertise and technology should not be construed as a phenomenon confined to a single subject area. As indicated by Szmrecsányi (1985), like science, technology is not neutral, on the contrary, it is the result of political, economic, and social interactions of the

⁴ Research on Brazilian Railroads from the past decades serve as important references for the subject, see Matos (1974), Mattoon Jr (1977), Lamounier (2000), Oliveira (2009), Goularti Filho e Queiroz (2011). For a more complete survey of the history of railways in Brazil see Oliveira (2014).

⁵ Of great importance in these universities there were researchers such as Milton Vargas, Shozo Motoyama, Marilda Nagamini, Ruy Gama, Júlio Roberto Katinsky and Tamás Szmrecsányi.

society that seeks its production or transfer. To understand the process of technology transfer, the historian must understand the society that generated such demands for technology. This methodological approach seeks to put technology within a broader social context and has permeated much of the current academic production within the history of the technology field.⁶

Given that technology and technical expertise are barely mentioned in the most formative histories of the Brazilian rail network, scholars interested in its role must work diligently to uncover the subjects in the primary sources. This gap in the historiography forces researchers to find and read sources in ways that allow for a better understanding of the accrual of railway technology in Brazil. The same documents that have been used to tell the history of railway economics or politics can be used again to tell the history of technology. The reports, opinions and projects undertaken by Viriato de Medeiros, for example, discuss issues important to understanding the process of technological exchange. An additional hurdle must be overcome, however. Most of these corporate sources remain the property of private corporations that are not open to researchers. Thus far, most available documents through which scholars can attempt to learn about the railroads are the company reports made available to the public only as reports to shareholders. From these reports it is possible to obtain annual information on corporate activities, the number of employees, revenues, expenses, projects, and shareholders. But other troves of documents remain removed from the researcher's gaze.

Only when researchers use the few publically available archives, as I did for my dissertation research into the organization of a railway company in the 1880s, can we compare the publicly available records to those held by private corporations⁷. While the public reports to shareholders provide little in the way of technological development, corporate documents, especially those produced by the chief engineer provide a wealth of information on the use of technology within the railway corporation, making it possible to study the use of new technologies such as concrete and theodolite.

However, the scant corporate sources held in public archives make it nearly impossible to accumulate convincing evidence on the use of technologies in the nation's railways. Only select collections of sources exist and researchers have had little luck in locating new collections of railroad companies' corporate documents. These limitations force scholars to read available sources in creative ways that can help connect the choices made within corporations to their real-world application. Existing documents from three main areas: government reports, engineering journals, and the papers of professional associations cast new light onto how the transfer of technology and technical expertise occurred with private corporations. In the matter of government reports, the Annual Reports produced by the presidents of provinces provide information on the growth and financial situation of the companies but make few references to the use or expansion of technology. These reports do identify the technical leaders of the companies, though, which can help establish the web of social relations that govern corporations. Given the absence of internal company documentation, engineering journals represent a source in the effort to map the transfer of technology. The journals cover the use of new technologies in numerous fields, including railways, and, in many cases, were written by the engineers directly involved in the process. The *Revista do Instituto Polytechnico Brasileiro* and the *Revista de Engenharia* have circulated among Brazil's community of engineers since the 1860s. The articles they contain give detailed accounts of the technologies used by companies, the origin of these technologies, and how these professionals learned about them. Professional associations provide a final potential source base for research into the history of railway technology. Promoted by their own membership the Clube de Engenharia, founded in 1880 in Rio de Janeiro, commonly discussed questions about technology in their meetings.⁸ The resulting exchanges were then published in the final reports of the club. Such professional associations influenced not only the professional field, but also the decisions of the Brazilian government in the early twentieth century. The perspectives on technology they present, therefore, are vital to our studies.

⁶ A good example is the work by Francisco (2007).

⁷ This is the documentation of Rioclarense Company, the reports of the chief engineer Antonio Francisco de Paula Souza. This documentation is in the Seção de Obras Raras of the Mário de Andrade Library, located in the city of São Paulo.

⁸ This was the case of Engineer Adolpho Augusto Pinto, from the Companhia Paulista, who referred questions concerning the expansion of the company western trunk line for discussion and opinion of the Clube de Engenharia, between 1901 and 1902. See Campos and Oliveira (2012).

What happened to the internal documentation of railway companies active in São Paulo? If the documents exist, their whereabouts are a mystery. The difficulty in locating official documents stems from the nationalization of companies in the 1960s and the subsequent privatization of those corporations in the decade? Because the documents changed hands and locations so many times, locating them and gaining access to them is incredibly difficult. Faced with this situation, researchers from the São Paulo State University (UNESP) have devised a project that aims to organize all the publicly available materials on the railroads of São Paulo into a single database. Far from offering an exhaustive collection, the initiative seeks, first and foremost, to preserve what is left of São Paulo rail memory.

The histories of technical expertise and technology related to transport are little explored by Brazilian academics. Despite the source limitations that exist, there are several research opportunities within the field, particularly in railways, inland waterways, and roadways. After choosing a subject, though, the next challenge for the historian of technology in Brazil is to overcome the obstacles of source availability and a static historiography that has only rarely dealt with technology's place in the nation's transportation system. It seems that there are scholars up to this challenge.

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