



The Work of Geographer and Civil Engineer on the Mapping of the City and Territory of São Paulo and the Emergence of Modern Geography

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The present research aims at discussing the connection between the work of professionals from geographical engineering and the emergence of modern geography as a discipline by studying the role of geographical engineer Carl Friedrich Joseph Rath in the making of the cartography of the city and territory of São Paulo in the 19th Century. This research highlights the role of Carl Friedrich Joseph Rath's professional activity in the making of the cartography of both the city and the territory of the Province of São Paulo in Brazil. A geographical engineer by profession, Carl Friedrich Joseph Rath was born in Stuttgart, Germany, 1802, and specialized in the natural sciences. His intellectual output as well as his professional work was related to the several scientific disciplines encompassed then by the natural sciences in the first half of the 19th Century. His work on the cartography of the city of São Paulo came about in the context of the discussions about the possibility of planning the expansion of the city, and resulted in a scientific planning of the urban growth. Carl Friederich Joseph Rath started his professional career working in the field of paleontology in Württemberg, and he'd remain throughout his life strongly interested in this new science, which later on emerged as a consolidated and specialized field of knowledge. The manuscripts and publications he produced after exploring the southern area of Brazil, especially the Province of São Paulo, which was quite large by then, and in which he reported his findings about, and descriptions of, the geography and mineralogy of the territory, reveal that he was also very interested in geology and, more particularly, in mineralogy. Although he remained professionally interested in these different fields of knowledge throughout his life - namely, paleontology, geology and mineralogy - it can be said, however, that such disciplines assumed only a secondary place in his professional career, which focused mainly on physical geography, a field where his knowledge of geology proved to be useful. Physical geography stood out as one of his main areas of professional activity during the thirty-one years he had lived in the Province of São Paulo, from 1845 to 1876. Carl Friederich Joseph Rath's work on the cartography of the territory and the city during the period of the emergence of physical geography as a discipline can be assessed through the study of the map of the Province of São Paulo, published in 1877, and the cartography of the city of São Paulo, spanning the period from 1855 to 1868.

In the field of the Natural Sciences this was the period when physical geography emerged as a discipline, and German naturalist and geographer Carl Ritter, together with his teacher, Alexander von Humboldt, laid out the foundations of modern geography. Carl Ritter was one of the pioneers of modern geography and one of the early advocates of its teaching at the University, as he conceived of geography as an empirical science which should resort to a method based on direct observation as opposed to inferences made from theoretical hypothesis. 'Die Erdkunde im Verhältniss zur Natur und zur Geschichte des Menschen' (The Science of Earth in relation to Natur and the History of mankind), published in 19 volumes (1817-1859), was his major work. He was the intellectual founder of the Frankfurt Association of Geographers (Frankfurter Geographische Gesellschaft), established in 1836. Carl Friederich Joseph Rath was one of the correspondents of the Association. By identifying Carl Friederich Joseph Rath's professional activity as a geographer, however, we don't intend to relegate to a secondary role the other professional activity in which he engaged and for which he was hired and became well known: his work as a civil engineer. Carl Friederich Joseph Rath was hired by the government of the Province of São Paulo as "provincial engineer" (engenheiro da província) and charged with the management of the roads during a period when the coffee industry was in expansion and the government of the Province adopted a policy to build a road network to transport the coffee. Still as a civil engineer, Carl Friederich Joseph Rath also worked throughout many years for the Imperial Chamber of The City of São Paulo (Câmara Imperial da Cidade de São Paulo). Besides, he resorted to his "medical" knowledge in several expert reports and services the Chamber of The City of São Paulo commissioned him with. This wide array of disciplines involved in Carl Friederich Joseph Rath's professional work displays the remarkable expertise he had in the fields of knowledge and practice regarding the city, including the mastery of notions typical of mid-19th Century medicine, such as the miasma theory of disease. Can we say that his planning of the expansion of the city was a scientific planning of the urban growth?

KEY WORDS: Scientific planning, urban growth, geographical engineering , cartography of the city and territory , modern geography.