

“Standardizing the Brazilian Nation in the Nineteenth Century”

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Abstract: The paper studies two major events that took place in a single year in Brazil’s history—the first national population census and the formal adoption of the metric system of weights and measures—to consider the politics and policies behind their conception, design and implementation. Both innovations emerged out of a new and growing international interest in statistics and the standardization of information and data collection. Both created closer contact between Brazilians working in the domestic economy and state officials whose policies had powerful effects on their lives. Statesmen believed that the adoption of the metric system created the conditions for regional and national exchange in the domestic economy, while the collection of basic demographic data about the makeup and distribution of the Brazilian population provided information essential to direct public policy, such as the allocation of government aid for improvements in domestic economic infrastructure like roads, bridges, river and rail transport, and warehouse facilities. In this paper, I analyze the institutional history of these innovations to explore how Brazilian political leaders came to see them as valuable endeavors and how they envisioned the utility of both to domestic economic and social development.

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The Brazilian Northeast was swept by revolt from October 1874 to January 1875. Peasants erupted in violent protest in more than 50 towns and villages in surprisingly similar ways, given the limited means of communication of the era. They smashed scales in the public market, confronted local officials, destroyed the tax rolls of the local tax collectors, and invaded local notarial offices and city council headquarters to burn public records. These revolts became known as the *Quebra Quilos* or Break the Scales revolts.¹

What the peasants were protesting, scholars argue, was an alarming series of government mandates that extended the reach of a modernizing state into realms previously safe from intrusion, or in ways that threatened to fundamentally alter the social relationships that characterized daily life. The first national census, conducted in September 1872, put every Brazilian face to face with the reach of the central government through the persons of the census takers. These men canvassed the population, recording information on categories of race, gender, age, marital status, profession, religion, nationality, literacy, physical deformity, and free vs. slave status, bringing these details to the attention of the government for the first time. The metric system, also implemented in 1872, is argued to have threatened the personal economy of peasants, for metric units of measurement were 10% smaller than the Portuguese Customary Units, yet, scholars argue, merchants resisted adjusting prices to reflect the smaller quantities in order to recapture the new taxes that accompanied the calibration of the new weights and measures.

These two institutional initiatives were accompanied by other efforts by the state to collect information on the lives and activities of Brazilians. These included the registry of slaves in response to the new policy of gradual abolition, begun in 1871; a new system of military

¹ For a map of the Northeastern revolts, see page 37 of this paper. Map is from Barman, "The Brazilian Peasantry Reexamined," p. 406.

service based on lists of all eligible men, rather than the old system of press-gang recruitment; and a new civil registry of baptisms, marriages, and deaths. The people whose data was captured through these various mechanisms, scholars argue, feared that these records might send them into war or categorize them as unfree. Poor Brazilians who were skeptical that the new reforms would apply equally to rich and poor, the argument goes, balked at expanded tax rolls, and worried that the new scientific census and military rolls would rob them of the patronage protection they actively cultivated. Moreover, the civil registry of marriages, births and deaths was an intrusion by the state into the relationship between parishioner and priest. At the very least, the reforms threatened to raise the price of their food and subject them to new taxes. These intrusions came to a head when religious conflict between masons (elite modernizers) and the Church (traditional protectors) rocked religious congregations in 1873 and 1874, while drought conditions and economic privation added fuel to a simmering unease. The efforts by the state to improve data collection threatened them, body and soul.²

Unrest such as that witnessed in the Brazilian Northeast was not unusual during times of major institutional change, for systems of knowing have strong cultural associations that are challenged or disrupted by modernizing reforms. Yet reforms like those studied here were common in the eighteenth and nineteenth centuries, partly due to the ideals of the Enlightenment but also due in no small part to the rapid technological and economic changes introduced by the

² Barman, "The Brazilian Peasantry Reexamined," p. 412: Beattie, *A Tribute of Blood*; Richardson, *Quebra-Quilos*. To my knowledge, no systematic economic history of the Quebra Quilos revolts exists; therefore, no study of the effect of the metric system on prices has been undertaken. As part of the larger project of which this paper is a part, I am gathering and analyzing market data from around Brazil to test the impact of the shift in weights and measures on commodity prices. In the meantime, it is worth noting that prices-as-fuel-for-revolts may have been the result of commodity shortages that raged in the northeast during this period rather than unscrupulous behavior on the part of merchants. Another candidate for higher prices was the imposition of new market taxes that were most likely passed along to consumers. It bears noting, in contravention to the prevailing scholarly arguments, that the small size of these communities and the local nature of market production and exchange may have mitigated the power of sellers to coerce or cheat buyers.

Industrial Revolution.³ Missing from these Brazilian histories of state intrusion and regional revolt is a careful consideration of modernization from the perspective of the state. Work on the Quebra Quilos revolts barely considers the institutional history of these major reforms or asks why the government sought to implement them in the first place. The literature casts the modernizing Brazilian state as incipient and seriously disconnected from the reality of the nation it governed, a quality that induced it to import foreign ideas about modern political administration regardless of fit with Brazilian conditions. Mara Loveman and others have likewise interpreted the failures of the state to rule the nation as the disjuncture between its modernizing ambitions and its limited capacity.⁴ In one of the most evocative images of the problem, historian José Murilo de Carvalho characterizes nineteenth-century Brazilian politics as “Shadow Theater” that stood in for a true liberal state. He writes, “In times of normalcy, the fiction of the constitutional regime, of representation, of parties, of political liberalism, of civilization predominated,” but this was a state with a “big head but very short arms. It was a giant in the Court but did not reach the municipalities and barely reached the provinces.”⁵

This paper argues that to dismiss these modernizing ambitions out of hand because of deficiencies of state capacity misses the point. It argues that the institutional history of the efforts to improve data collection and standardization are evidence of unfolding state capacity building, meriting closer and more serious attention than they have been accorded. This position is in line with scholarship that challenges the “misplaced ideas” thesis that has held much sway among historians of the nineteenth century, a thesis that accuses Brazilian modernizers of adopting imported ideas and policies that held little resonance with the Brazilian reality. Recent

³ Ashworth, “Metrology and the State”: Duncan, *Notes on social measurement*; Thompson, “Time, Work Discipline, and Industrial Capitalism”; Alder, “The Metric Revolution” and “A Revolution to Measure.”

⁴ Loveman, “Blinded Like a State”

⁵ Carvalho, *A construção da ordem*, 163.

work by Teresa Cribelli, in particular, develops the case that the Brazilian modernizers had a perspective on modernization that was uniquely Brazilian, not imported, and cultivated through research, not adopted to satisfy foreign opinion.⁶ In this paper, I examine the modernizing reforms of 1870s as the culmination of a long process of interaction and integration with international societies enthused by the possibilities of rational data for improved governance. This paper recovers the institutional background of these two innovations—the 1872 census and adoption of the metric system—that caused so much distress across the Northeast (yet not elsewhere) to consider the questions of when, why, and how Brazilian statesmen came to see them as valuable endeavors and to understand what they viewed as the utility of both.

The search for standards in Brazilian governance

Brazil's search for standards was present from the beginning of its modern era and enshrined in its first constitution. Among the responsibilities of the chamber of deputies laid out in newly-independent Brazil's 1824 constitution was that of establishing "the weight, value, inscription, type, and denomination of coinage and the pattern for weights and measures."⁷ This responsibility was part of an Enlightenment concern with standardization and uniformity, notions at the center of intellectual and practical debates in the eighteenth century and the absence of which provided part of the fuel for the French Revolution. In response to this mandated responsibility, a commission was formed in early 1833 to study the existing systems of weights and measures used in Brazil. These were the Portuguese Customary Units that had been introduced by King Manoel I in 1495 in Portugal and all its colonial possessions. In its

⁶ Cribelli, *Industrial Forests*

⁷ Brazil. *Constituição Política do Império do Brasil*, 1824, Title IV, article XVII. Stephen Mihm notes that the United States explicitly included Congressional responsibility for the standardization of weights and measures in its own constitution of 1781, and that Thomas Jefferson was the leading proponent for a uniform system of currency for the new nation. As was the experience with Brazil, France, and other countries, this standardization was much debated and elusive for decades. Mihm, "State Standards: Weights, Measures, and Market Regulation in the Early American Republic" presented to the 2015 Business History Conference Annual Meeting, Miami, June 24-27.

instructions to the committee, the assembly did not suggest the system needed changing. Indeed, it said that the commission should “respect the established usages, as long as it is compatible with the exactitude and uniformity that are indispensable”⁸

The committee focused on uniformity, exactitude, and the ease of establishing and fixing the relationship among the standards, as well as the similarity to foreign nations “principally those with whom we have the greatest commerce.”⁹ Its report carefully measured and identified equivalencies between the three essential standards: the measurement of length, the *vara commercial* or commercial yard; the measurement of weight, the English pound; and the measurement of capacity, the *canada* (approximately a gallon) and the *alqueire* (both a measure of dry quantity and of land acreage). It determined it was possible to define exact measurements of each and exact relationships between the three measures; both the pound and the *canada* were measured in cubic inches, a measure easily related to length. Brazil’s monetary system was based on a similar system and could be translated into equivalent/proportional values between gold, silver, and copper that is very close to their market values. This 1834 report set the equivalencies between coinage in the three metals and the limits of variance from the standard, which they noted was the same as the rules of equivalence for France’s mint. In other words, the Brazilians were acutely aware of the standards maintained in other countries and went to lengths to align their system with those of “civilized peoples.”¹⁰ In the end, they determined that the system in place met the initial requirements of exactitude and uniformity.

This pursuit of exactitude and uniformity in systems of measurement was not unrelated to the search for precision in the 19th century, driven in part by the new discipline of statistics.

⁸ Brazil. *Relatorio sobre o Melhoramento do Systema de Pezos e Medidas e Monetario ...pela commisao para esse fim nomeada por decreto de 8 de janeiro de 1834*, p. 5. www.memoriaestatistica.br

⁹ *Ibid*, 6

¹⁰ *Ibid*, 18

Statistics was viewed as a powerful way to address the many ills of societies, as well as to harness the capabilities of nations, that had been roiled by revolutions of political, social, and economic natures. In 1838 the Statistical Society of London founded a journal to promote this new science, “only recently actively pursued in this country”, through which it promoted the study society’s problems and to propose solutions. Statistics is “to be the ascertaining and bringing together of facts calculated to illustrate the condition and prospects of society.”¹¹ Related to political economy in its concerns, this new statistical science was distinct from it because it did not concern itself with causes or effects: “it seeks only to collect, arrange, and compare, that class of facts which alone can form the basis of correct conclusions with respect to social and political government.”¹²

The London society was one such of an international collection of statistical agencies, including one in Brazil founded in Rio in 1854 under the auspices of the Emperor to collect statistic of the empire, with branches in the province.¹³ These societies gathered in international congresses beginning in the 1850s to debate the ways statistics can improve diagnosis of social problems; standardize information gathered about national demographics, economics, and commerce; and utilize improved information to enhance international trade. The reports on these congresses were heady with the power of numbers to identify, to quantify, to standardize in the pursuit of good governance. “Statistics...are to politics and to the art of governing, what anatomy is to physiology in the study of the human body...The statesman who pretends to govern without knowing the important facts which interest society, makes a more fruitless attempt than the

¹¹ “Introduction” *Journal of the Statistical Society of London*, Vol 1 No 1 (May, 1838), p. 1

¹² *Ibid.*

¹³ *Report of the Proceedings of the Fourth Session of the International Statistical Congress, Held in London July 16th 1860, and the Five following Days* edited by William Farr, London, 1861. This report mentions that the Brazilian statistical society published a quarterly journal. I have not yet located that journal. It seems to be related to the Diretoria Geral de Estatística, the government agency that was formed to carry out the first census in 1872.

philosopher who should propose to make a general classification of the beings which compose the three kingdoms of nature, without knowing the essential character of them.”¹⁴

Statistics and the quest for uniformity went hand in hand with international expositions promoting economic innovation and exchange. The first of these, the Great Exhibition of the World of Industry of All Nations, was held in London on May 1, 1851 in celebration of the technological innovations of a rapidly changing world. According to Ronald Crease, this exposition brought to the forefront the difficulties of comparing the results of engineering and science produced by different systems of measurement and led to the recommendation that a uniform system be adopted throughout the world.¹⁵ It was followed four years later in Paris, where the French hosted their own International Exposition of Agriculture, Industry, and Fine Arts, at which they showcased their metric system and which represented the first time Brazil participated in these international gatherings. Four international statistics congresses quickly emerged in the wake of the British international expo, interwoven with the larger celebrations of science and technology to promote the new statistical science: in Brussels in 1853 “For the Purpose of Introducing Unity in the Statistical Documents of all Countries;” in Paris in 1855, shortly after its international expo; in Vienna in 1857, and in London in 1860, the first of the statistical congresses attended by Brazil.¹⁶

Brazil was represented at the London International Statistical Congress, held at King’s College, by its minister in London, Francisco Ignacio Carvalho Moreira. Brazil had formed its own statistical society in 1854 and sent an observer delegation to the Paris International Expo of

¹⁴ The Statistical Society founded in Rio de Janeiro collected general statistics of the empire. The report mentioned that it “had branches in the provinces, and published a quarterly journal.” “Resume of the Second Session of the International Statistical Congress Held at Paris, September, 1855” in *Journal of the Statistical Society of London*, Vol 19, No 1 (Mar, 1856), p. 1

¹⁵ Crease, *World in the Balance*, 126-128.

¹⁶ More expos and statistical conferences followed in the second half of the nineteenth century. I focus on these because they capture the initial participation of Brazil, which became a regular exhibitor and contributor after 1860.

1855, but this 1860 statistical conference marked its first active participation in international conversations and debates about the power of data and of a unified system of measurement to improve public administration and foster international exchange.¹⁷ The proceedings from the congress included the observation, “Brazil has never before taken any part at the [statistics] Congress, but takes a lively interest in its proceedings now, and will contribute all it can to the prosecution of inquiries of universal utility.”¹⁸ Moreira was named a Vice President of the Third Section, Industrial Statistics: Agriculture and Mining.

Brazilian’s formal participation in international congresses may have dated to 1855 as statesmen, scientists, and engineers sought to integrate Brazil into the international economy and to improve governance at home, but they had already begun to grapple with the importance of data collection decades earlier. The *Ministério do Império*, or Ministry of Empire, began lamenting the absence of good data from the beginning of its mandate, particularly data on Brazil’s population. Population was first articulated as a concern of the ministry in 1834, when minister Joaquim Vieira da Silva e Souza equated Brazilian prosperity with the size of its population. Asserting that the nation could easily support “more than eighty million inhabitants; without lowering a subdivision of their land” yet guessing that its population “by a rough estimate only amounts to six million,” the minister pushed for immediate measures to increase the population of the country either through attracting immigrant colonists or promoting internal growth through preferential benefits for married men.¹⁹ By 1836, the ministry routinely compiled

¹⁷ “Report to the Statistical Society on the Proceedings of the Fourth Session of the International Statistical Congress, Held in London, July 1860” *Journal of the Statistical Society of London*, Vol. 23, No. 3 (Sep., 1860), pp. 384-386.

¹⁸ *Report of the Proceedings of the Fourth Session*, 40.

¹⁹ Of course, there was a strongly racist motivation behind this call. The African slave trade had been nominally outlawed by treaty in 1831 (though it continued at an intensified pace until 1850), and the native population was considered “not hard-working.” If domestic population growth was the path, then, “police measures that tend, if not to extirpate, at least to reduce laziness” would be needed. Brazil. Ministério do Império. Relatorio...do anno de 1835. “Relatorio da Repartição dos Negocios do Imperio apresentato á Assembléa Geral Legislativa na sessão

and reported demographic data for the municipality of Rio de Janeiro in its annual reports, and urged, cajoled and tried to shame the provinces into doing the same so that the government could best understand where to direct its efforts at attracting or promoting new population growth. In his annual report for 1837 delivered to the General Legislative Assembly, the Interim Minister and Secretary of State, Bernardo Pereira de Vasconcellos, wrote:

For all, and principally you [members of the Assembly], the need for a Statistic is known, that not only contains an accurate census, or at least an approximation of the population of the State, as well as its production in general, and in particular; of its industry, wealth, commerce, administration, and last of all, what makes up the force and the greatness of a country. Without it either all the financial and administrative calculations will fail or will be more difficult, and moral, physical, scientific, and political improvements to the social organization and social relations will barely be able to be evaluated and understood.²⁰

Good population data was essential to this ministry, whose portfolio included agriculture, industry, and commerce, but also public instruction, public health, public works, and poor relief.

The expressed urgency of stimulating population growth quickly evolved into regular, annual calls for improved population statistics. These reports also express frustration over the lack of good civil registries to gather statistics on Brazilian society. The ministry reached out to the provinces in search of data about the population, particularly about births and deaths, and very soon added calls for a civil registry of basic demographic data to its annual reports.

Provinces would comply periodically, as Santa Catarina, Rio Grande do Norte, Piauí, and Mato Grosso did in 1838. But the report for 1840 lamented “the same obscurity with respect to our population.”

ordinaria de 1836.” Rio de Janeiro: Typographia Nacional, 1836, p. 21. This call for population growth was echoed in Argentina, where Juan Bautista Alberdi penned “Immigration as a Means of Progress” and proposed an immigration policy under the slogan, “To govern is to populate.” *The Argentina Reader*, Gabriela Nouzeilles and Graciela Montaldo, eds. Durham: Duke University Press, 2002, pp. 95-101.

²⁰ Brazil. Ministério do Império. Relatorio...do anno de 1837. “Relatorio da Repartição dos Negocios do Imperio apresentado á Assembléa Geral Legislativa na sessão ordinaria de 1838.” Rio de Janeiro: Typographia Nacional, 1838, 29.

Despite being treated in the reports of this office under my charge, it seems the provincial administrators do not understand/do not perceive the necessity of these clarifications, which are indispensable for many administrative calculations. The very provinces that have the greatest ease to organize such tables are the very ones that have done the least.²¹

A few years later, the minister drew attention to the Brazilian failures in the context of organized censuses conducted in one of the countries Brazil fashioned itself after: the United States.

“Thanks to the zeal of our Chargé d'affaires in the United States, we are aware of important documents about the population of those States: it would be very much to wish that our circumstances allow us to perform similar works.”²² Scholars like Mara Loveman and Roderick Barman have argued that this was typical of the nineteenth century—the adoption of imported ideas of progress and modernity with little regard to the realities of the state’s capacity to govern its continental-sized territory. Miriam Dohnikoff writes not of a failure to govern, but of a compact between the central government and provincial elites whereby provincial deputies gave support to the central government for its agenda, which in return granted the provinces autonomy in taxation, legislation, and political coercion.²³ This suggests that the provincial state *was* capable of ruling, and therefore implementing the agenda of the central state given the proper incentives. But it appears from the ministry reports that the provinces were no better at capturing (or did not care to) basic demographic data within their own borders than the central government

²¹ Brazil. Ministério do Império. Relatório do anno de 1840. “Relatório apresentado á Assembléa Geral Legislativa na sessão ordinária de 1841.” Rio de Janeiro: Typographia Nacional, 1841, 25-26

²² Brazil. Ministério do Império. Relatório do anno de 1843. “Relatório apresentado á Assembléa Geral Legislativa na sessão ordinária de 1844.” Rio de Janeiro: Typographia Nacional, 1844, 21

²³ Mara Loveman, “Blinded Like a State”; Barman, *Brazil: Forging of a Nation*; Dohnikoff, *O Pacto Imperial* and “Entre o centro e a província.” In “Entre o centro e a província,” Dohnikoff writes, “Provincial autonomy focused on taxation, provincial and municipal jobs, public works and the police force, so that governments had the financial capacity to decide on investments in areas vital to economic expansion, the exercise of coercive force and control over part of the public machine” (81–82). Presumably, state authority could roll up from the local to the provincial to the national state. An important new book by Hendrik Kraay, *Days of National Festivity*, traces the consolidation of the state through pageantry and celebration of a somewhat fictionalized and inevitable independence and political evolution, a project that took six decades to accomplish.

was. The provinces that did respond to the Minister of Empire's calls for population data submitted something like counts, but others sent rough guesses, unofficial counts, and vague statements that population was growing, little more.²⁴

By 1847, the frustration with the lack of cooperation from the provinces was palpable. The minister vented that no one assumed ownership of the project: "the Presidents of the Provinces blame the Chiefs of Police, these blame the authorities subordinate to them, and these blame the reluctance of many inhabitants to present family lists."²⁵ After suggesting that local police and judicial and religious figures be subject to criminal prosecution for failing to fulfill their legally-mandated responsibility to collect and remit such data, he adopted a more politically-expedient approach.²⁶ What was needed was will by the central government and money, "the means," to grease the wheels of a demographic apparatus.

Because of the difficulties that the Government is having in order to obtain this first essential element of Statistics, you may well appreciate the difficulties of the Administration in all measures that require the accurate knowledge of the country, both as regards the numeric picture of its population, moral and material state, industry, production, and consumption, as in all other elements of public strength and prosperity which are still so poorly observed among us; And from this you will conclude that it is important that even at the cost of great sacrifices the means of organizing the Statistic of the Empire in all the various objectives which it comprehends, thereby the Government should enable it with the requisite pecuniary resources, since without the means for such an important job I cannot afford to undertake it.²⁷

The value of this population data was to better stimulate commerce and industry, endeavors vital to the economic health of a nation and to the political viability of a central government besieged by regional revolts. The same 1837 report discussed earlier that declared

²⁴ The 1844 report complained that São Paulo had passed a provincial law in 1840 to count the population of the province, but by 1843 had only collected data for five of its municipalities.

²⁵ Brazil. Ministério do Império. Relatório do anno de 1847. "Relatório apresentado á Assembléa Geral Legislativa na sessão ordinaria de 1848." Rio de Janeiro: Typographia Nacional, 1848, 30-32

²⁶ This responsibility was laid out in Brazilian Regulation 120 of 31 January 1842, article 58, which establishes the attributes of the Chief of Police. Among them, the responsibility to "organize a registry (arrolamento) of the population per his delegates, sub-delegates, justices of the peace and parish priests."

²⁷ Ibid.

statistics of central importance to good governance commented on the modest start toward realizing its goal. It observed, “Up to now, the only [statistics] that exist ... are imperfect lists of deaths, and births; imperfect tables of mercantile, and maritime, movements, and nothing more. [...] I want the collection of these elements to begin, that they gradually go on to form the great volume of this interesting work.”²⁸ After years of requests that fell on deaf ears, the ministry report for 1848, offered something of an impassioned rendering of the powers of good data, as the minister affirmed his resolve to print even incomplete data in his mission to contribute to its perfection in future years:

In the complete absence of other data and information on the commercial movement, you will see in Table n. 14 the value of foreign goods which were dispatched for consumption to the customs houses of the empire during the financial year 1847-1848, as well as that of the country's genres of production which during the same year were exported to foreign countries. The benefit of such incomplete work is small; I thought it convenient to present it anyway, because it will be improving in future reports; And as soon as it is perfect, and if the term of comparison between identical works of several years can be established, we will have data so certain, which is the comparison between production and consumption, between importation and exportation, to judge of the progress or decline of commerce.²⁹

By the time Brazil attended the new international conferences dedicated to finding international standards of data collection and measurement, it had already set its sights on these topics. Chevalier Carvalho Moreira's affirmation at the 1860 International Statistical Congress of the importance Brazil placed on statistics in its governance, then, he was summarizing decades of interest taken by the Brazilian government to improve governance through data collection. Although incomplete and inconsistent from year to year, by 1860 statistical data was a mainstay of the reports made by the six ministries that oversaw Brazil's affairs—Empire (Interior), Finance, Justice, Marine, War, and Foreign Affairs—and presented at the opening of each

²⁸ Brazil. Ministério do Império. Relatorio...do anno de 1837, 29.

²⁹ Brazil. Ministério do Império. Relatorio do anno de 1848. “Relatorio apresentado á Assemblés Geral Leslativa na sessão ordinaria de 1849.” Rio de Janeiro: Typographia Nacional, 1849, 31.

session of parliament (indeed, they are an indispensable source of data for modern researchers).

“These reports placed before the two Chambers a complete view of the progress of the empire, as exhibited by statistical tables carefully and systematically arranged.”³⁰ Provincial Presidents presented similar reports, also incomplete and inconsistent, to their provincial legislative assemblies each year.

The Census

Moreira reported to the 1860 London conference delegates that his government was in the process of filling a major lacuna in its knowledge--a count of the Brazilian population; plans were underway to implement the first national census. In fact, funding for the first national population census had been authorized ten years early in 1850 in a budget law, and the calls for census taking extended back to the beginning of the empire.³¹ A national law predating the constitution, Law of 20 October 1823, charged every provincial president with forming a council responsible for the census and statistics of their province. An official pronouncement of 8 August 1826 ordered every province to formulate uniform statistical tables. In 1829, by Decree of 25 November, the imperial capital created a statistics commission responsible for the classification of Brazil's geography, nature, politics, and civil society. The responsibility of provincial legislative assemblies to work with the General Government Assembly to promote the organization of statistics of their respective provinces was embedded in the 1834 Additional Act, a law that revised Brazil's 1824 constitution. Regulation 120 of 31 January 1842 charged police chiefs with making rolls of the population, and Law 387 of 19 August 1846 mandated that

³⁰ *Report of the Proceedings of the Fourth Session*, 40.

³¹ This law, Law 586 of 6 September 1850 that set the budget for the 1851-52 fiscal year, authorized “expenditures necessary to carry out, in the shortest time frame possible, the general census of the Empire, with specifications regarding every one of the Provinces; moreover, to establish regular Registries of annual births and deaths.” Brazil. *Leis e Decretos*. Law 586 of 6 September 1850, Article 17, Paragraph 3: “Para despender o que necessario for a fim de Levár a effeito no meno prazo possivel o Censo geral do Imperio, com especificação do que respeita a cada huma das Provincias: e outrosim para estabelecer Registros regulares dos nascimentos e obitos annuaes

population censuses be taken every eight years. By the time the formal census was budgeted in 1850, then, more than 25 years of legislative efforts to improve population data and other statistics had been in effect.

The first nationwide census, scheduled for July 1852, did not take place. Before it was underway, violence erupted over the contemporaneous introduction of a national civil registry. The civil registry would place population data in the hands of the government without intermediation from the Catholic Church, the only registrar of births, marriages, and deaths at the time. The government worried that leaving such vital records in the hands of the church risked missing data on non-Catholics, whether Brazilian-born or immigrants, or stigmatized families that formed outside of the sanctity of marriage. It did not preclude the Church from continuing to register the sacraments, but it did place the collection of the same information in the hands of a civil servant, offending the Church and its followers. At the same time, the civil registry decree had been rumored-untruthfully-to categorize free people of color as slaves.³² In response to the uprisings, named “the war of the wasps,” both the registry and census were quickly abandoned.³³ Calling the events “grave”, the Minister of Empire reported that census takers faced the difficulty of carrying out the census in the face of “old notions and inveterate habits.” Complicating the task further was “the vast extension of our territory, for the most part uncultured and unpopulated”, and the “lack of means of transportation to travel enormous distances of the interior.”³⁴ Indeed, Loveman affirms that aside from being out of touch with realities of daily life, the modernizing plans of the state extended the reach of its effective capacity.³⁵

³² Loveman, “Blinded Like a State”, 20-22.

³³ This uprising, known as “war of the wasps” is analyzed in Loveman, “Blinded Like a State”.

³⁴ Brazil. Ministerio do Imperio. Annual report for 1852, p. 33.

³⁵ Loveman, “Blinded Like a State”

No new attempts to conduct a national census were made before 1872, but ministry reports for 1867, 1868 and 1869 declared a new campaign to remedy this great statistical failure. The minister in 1867, José Joaquim Fernandes Torres, who had previously served as Minister of Justice and Treasury and as provincial president in Minas Gerais and Sao Paulo, proposed a trial run to acclimate the population to the census:

I understand that the fulfillment of this important and urgent need can no longer be delayed, despite the great practical difficulties which, by the special circumstances of our country, naturally occur in the performance of such works, which are considered in the report to which I referred. Every possible effort should be made to overcome them, starting with trial runs: in that way not only will one know how to get the best results, but the population will gradually become accustomed to all the investigations that are imperative to proceed

His suggestion was reiterated in under his successor. The minister in 1868 and 1869, Paulino José Soares de Souza, long-serving member of the Chamber of Deputies and son of the powerful statesman Visconde de Uruguai, advocated for the financial support and political will to finally remedy the situation. “The lack of statistical data,” he wrote, “is one of the difficulties the Administration has to contend with,” especially regarding the census. The most reliable calculations the nation possessed dated to 1834, an extrapolation based on calculations from the election of the Regent, contributing to “missteps the Administration encounters every day for lack of statistical data.” Acknowledging the difficulties of the project, he vowed to undertake new work to get the census done and said it was “advisable for the Government to enable this with the necessary means.”

A year later, still awaiting authorization of those means, he published a scathing report recapitulated the long history of government attempts to conduct a census to make clear the scope of the failure.

An appreciation of social facts demands the knowledge of data that reveal the state of the country, considered from various aspects that highly interest those charged with its

direction, whether in the decree of laws, whether in the regulatory and providential dispositions needed for their execution. These data, however, cannot be collected except at the cost of unshakable perseverance, which sadly we have lacked.³⁶

Now that the War of Paraguay (1864-1870) was won, and the financial state of the country was healthy enough to avoid new taxes to pay for it, he argued the census must proceed. He asked the Chamber to include funding in its next budget, while his ministry worked out the logistical and analytical details of the nationwide census through a test run in April 1870. He succeeded. The results of the test census yielded detailed data on the population of the municipality, divided in national and foreign, male and female, number of buildings, public and private, number of hearths, number of churches and convents, of prisons, of military barracks and posts, and of hospitals and charities. Perhaps more importantly, this test census conducted in the imperial capital in 1870 was used to refine the methods required for a nationwide count. [to be developed: that this included the logistics of going door to door, deciding what information to collect, and testing various mathematical algorithms for arriving at the total population].

With the test census completed, the government authorized the nationwide census by Law 1829 of 9 September 1870.³⁷ A few months later, the Diretoria Geral de Estatística or General Directorate of Statistics (DGE) was formed, authorized by the 1870 law and housed in the Ministry of Empire. The DGE was tasked most visibly with carrying out the decadal census, but also the annual civil registry of births, marriages and deaths that had so inflamed the Northern provinces in 1852, and the coordination and analysis of all statistical data collected by

³⁶ Brazil. Ministério do Império. Annual report for 1869, pp. 24-25.

³⁷ As was typical in Brazilian legislation, laws established the broad outlines of government initiatives, while decrees specified the details of their implementation. The decree to implement the census, including the details of where, when, and how it was to be executed, was Decree 4856 of 30 December 1871.

the various public offices of the Empire.³⁸ Legislation passed in late 1871 laid out the precise method by which the census would be taken as well as the date: August 1, 1872.

On that date, all inhabitants of Brazil—citizens, foreigners, free and slave—were to be registered in the residence or place where they were on that day. The census was to be taken by family ballots or lists that captured data of each person in the household (name, sex, age, color, marital status, nationality, education, religion, and apparent physical deformities) as well as the relationship to the head of household and whether or not children aged 6 to 15 attended school. The law included a clear definition of “family” and included provisions recording people residing in non-familial groups like military, religious personnel, orphans, prisoners, individuals living in group homes or in work houses, and the infirm housed in religious charitable organizations.³⁹ The census would be carried out at the parish level by a census committee composed of five citizens residing in the parish who were familiar with its boundaries and its inhabitants. These committees divided up their parish in as many subsections as needed for the census to be thoroughly executed by a single agent, and nominated those agents.

Agents bore the greatest responsibility for conducting the census. The agents had to know how to read and write, be intelligent, active, and well known in the parish or the section of the parish they were to canvas. Heads of household were responsible for filling out the ballots, but in recognition of the widespread illiteracy in Brazil, agents were responsible for assisting them as needed. In the two weeks leading up to the August 1 census date, agents were to distribute the forms provided by the census commission. They were charged with recording the distribution of

³⁸ Brazil. Colecao de Leis e Decretos, Decree 4676 of 14 January 1871

³⁹ “Family” was defined as “a free person who lives alone by him/herself in a home or section of a home, or a certain number of people that, because of relationships of parentage or subordination or simple dependency, live in a home or part of a home under the power, direction, or protection of the owner, donee, or lessee, and with a common economy. Brazil. Leis e Decretos. Decree 4856 of 30 December 1871, article 3, paragraph 1

these lists to families and other groups (military, religious, charitable, etc); the name of locations such as settlements, farms and plantations; the names of streets, alleys, crossings, squares, roads and paths; the addresses of houses (if any), noting which were inhabited and uninhabited, whether they had one or more than one floor; and the names of heads of households or persons responsible for filling out the family lists. During the ten days after August 1, the agent returned to the households (and other establishments) to collect the ballots, verifying the data with the head of household or the person that filled them out in order to make corrections of errors or inexactitudes. At this time, these agents filled out the lists for the illiterate heads of household. By August 16, the agents turned the forms into their census commission, which in turn verified the lists and ballots before sending them to the imperial capital to be compiled and analyzed by the DGE.

[I plan to visit the archives in Rio de Janeiro in July 2018 to learn more about the bureaucracy of the DGE and to search for primary source documents from the 1872 census.]

The census was a long time coming in Brazilian government administration plans, seen as vital for national economic development and administrative effectiveness. In rebuttal to the scholarship about imported notions of governance or Brazilian attempts to impress its foreign partners through adopting their ideas, it is worth noting that the laws authorizing, indeed requiring, the conduct of the Brazilian census predated the major international conferences on census taking, beginning in 1855. While this observation is not the same as arguing that the modernization campaigns reflected robust state capacity, it is an important corrective to the standing interpretation that the Brazilian government mindlessly adopted imported models of modernization. The proliferation of statistical reports throughout the ministries and the decades-

long call for better population data were directly motivated by an articulated desire for better policy-making instruments.

The Metric System

Like the implementation of the 1872 census, the path leading to the adoption of the metric system of weights and measures was much longer and more deliberate than portrayed in the historiography surrounding the peasant revolts that broke out in its wake. The pursuit of quantitative uniformity and national-level data, the spread of the science of statistics, and the expressed desire in these international conferences for an agreement on measurement standards to foster comparisons, were related to Brazil's decision to adopt the French metric system of weights and measures. This system had first been adopted (and only weakly implemented) by Portugal in 1814 when still under French control toward the end of the Napoleonic War, and then definitively by Portugal and its colonial possessions in 1852. It was widely promoted to international observers at the 1855 Paris exposition. Many countries, by this time, had debated internally whether to adopt the metric system. Brazil's embrace of the new system was part of an international wave of such adoptions, including in a number of countries in Latin America.⁴⁰

As we saw in the beginning of this paper, the state's responsibility to adopt a system of uniform weights and measures was established in the Brazilian constitution of 1824 and led to the 1833 report, initially commissioned with hopes of adopting the metric system in Brazil, that justified the Portuguese system already in place.⁴¹ The movement to adopt the metric system dated to the Paris Universal Exposition in 1855. Emperor Pedro II nominated a committee to attend the first International Exposition of Agriculture, Industry, and Fine Arts in Paris, at which

⁴⁰ Richardson, *Quebra-Quilos and Peasant Resistance*, 85

⁴¹ The outcome should not have been a surprise, for the metric system was only definitively adopted in France, its country of origin, four years after the report in 1837. Sarmiento, "A Medida do Progresso", 25.

the French showcased its adoption of the metric system. The Brazilian delegation included mathematician Giacomo Raja Gabaglia, engineer Guilherme Schüch (the Baron of Capanema), and poet and ethnographer Antônio Gonçalves Dias.⁴² As part of the international expo's agenda, a working group "composed of notables from all the European nations was organized to develop the propaganda for the adoption of a new single system of weights, measures and currency among various civilized countries of the globe." The conclusion of the deliberations among the attendees, according to Gabaglia, Schüch and Dias, was that "the system that was easiest and with a highest probability of success was the French modern or metric system."

The search for international standards to ease commerce and promote collaboration resonated with Gabaglia, Schüch and Dias, who authored an 1860 report, eventually submitted to the new Ministry of Agriculture, Commerce and Industry, strongly supporting the adoption of the French metric system because of the vital importance of having precise standards for the advance of science, engineering, and international exchange. The three had formed part of a scientific commission to the Brazilian Northeast in 1858 to get to know the interior, a mission at the time known pejoratively as the 'Butterfly Expedition.' This mission yielded research on the causes and potential remedies for drought, countering the idea that the central state did not care about or was out of touch with daily life.⁴³ It was while they were away that they discussed the matter among themselves and developed a position paper on the subject, for the lengthy and detailed report was submitted from the northeastern province Ceará and its preamble, included as an annex to the 1860 Ministry of Agriculture annual report, indicates they expected to encounter official resistance to the idea. It laid out a detailed defense of the new system as well as a

⁴² Ibid, 7.

⁴³ Brazil. Ministry of Empire annual report for

proposal for how to implement it in Brazil.⁴⁴ Thousands of sets of the new weights and measures were to be bought to distribute to Brazil's merchants and vendors, made of same form and metal adopted in France. A trusted individual should be placed in France to guard over the construction of these standard sets and to learn all of the details of their manufacture to account for expenditures and root out fraud. Year by year, the use of the metric system should be expanded throughout Brazil's productive, commercial and service sectors. All offices, public and private, had to adopt the new system in their titles, documents, and transactions by the second year; this included medical professionals in their prescriptions, engineers in their proposals, notaries in their contracts, and so forth. Edicts would be posted in all public places; priests, teachers and police would be taught to use the new system and popularize it as much as possible in advance of the official adoption.⁴⁵

Two years later in 1862 the Brazilian legislature passed the law making the metric system of weights and measures the official system of the land, with a ten-year period to phase in its use, double the five-year period advocated by Drs. Gabaglia and company.⁴⁶ [I am investigating the legislative debates that led up to the passage of this law, but have not untangled their history as of this draft.] The responsibility for the adoption of metric system fell under the ministry of Agricultural, Commerce, and Public Works, carved out of the Ministry of Empire into a separate entity in 1860.⁴⁷ In fact, the first mention of the metric system coincided with the ministry's

⁴⁴ Annexo E, "A new system of weights and measures." pp E0-E4

⁴⁵ Ibid.

⁴⁶ Brazil. Laws and Decrees. Law 1157 of 26 June 1862, "Establishes the substitution in all the Empire of the system of weights and measures by the French metric system as regards linear measures of surface, capacity, and weight. Fixes a term of 10 years for the substitution of the system in use and requires classes in the metric system in all of school arithmetic curricula." See also Decree 5089 of 18 September 1872 and Decree 5169 of 11 December 1872.

⁴⁷ The Minister of Empire reports had been complaining for some time that the ministry had too many disparate responsibilities and that no other civilized nation combined so many unrelated responsibilities under a single organization. Legislative decree 1067 of 28 July 1860 distributed some of the portfolio responsibilities of the Ministry of Empire to the newly-formed Ministry of Agriculture, Commerce, and Public Works.

formation and by 1862 the law adopting the metric system had passed and the new ministry was planning for its implementation.

Cognizant of upheavals in other countries over such a monumental change, and perhaps cautioned by the revolts over the 1852 census, the Minister of Agriculture understood that “the change of the current system of weights and measures will find reluctance and opposition from the less intelligent and illustrious population, as happened in France and recently in Portugal.”⁴⁸ He intended to ask all of the provincial presidents to gather up and remit existing standards of weights and measures to the capital so that equivalency tables could be drawn up to ease the transition from the old system to the new.⁴⁹ At the same time, he ordered all government agencies to begin using the metric system immediately, to help acclimatize the population to their presence. On a practical note, he ordered the standards by which local weights and measures would be calibrated from France for distribution throughout the country.

At the same time as he prepared for the introduction of the metric system, the Minister of Agriculture, Commerce and Public Works also argued for the creation of a separate division of statistics. He wrote in 1862 that statistical works might be general to describe all the aspects of a country, or specialized to topics like public administration, or social life, or locals, or organizations.

Some recent work has been done on the population, and some citizens have taken it upon themselves to describe their home province in statistical terms or some aspects of its commerce or agriculture. The treasury keeps tabs on Brazil’s internal and external commerce, which deserves mention. All this is useful and helps administer public business, giving it something other than vague hypotheses to calculate the force of the nation on one or another object. However meritorious these works, they have not shed

⁴⁸ Brazil. Ministry of Agriculture. Annual Report for 1860, p. 17

⁴⁹ In the report for the year 1863, the minister writes, “The preparatory works for the reduction of weights and measures used in the Empire to the decimal system. Exemplars of the measures of capacity used in the provinces have arrived from a large part of them; however, only in view of all will the work be able to proceed to public the equivalency tables, indispensable for the definitive adoption of the new system of weights and measures.” He explicitly acknowledges that under the customary system, the values of weights and measures varied from province to province. Brazil. Ministry of Agriculture. Annual Report for 1860, pp. 11-12

light except on highlighted points of the country and its government, making more salient, in contrast, the obscurity that dominates overall...⁵⁰

That same report also proudly detailed Brazil's successful participation in the "Exposition of National Products in London" in 1862, where Brazil displayed "some specimens of its nascent industry clearly proved its aptitude for all of the mechanical arts" to great success: the English jury awarded prizes to 48 Brazilian exhibitors Brazil. This growing international participation by Brazilian diplomats and economic delegates—the third, counting the Paris exposition of 1855 and the statistical societies meetings that immediately followed, and the 1860 meeting of the international statistical society—supported the calls by some Brazilians for adopting international standards and improving its internal statistics.⁵¹ Later reports affirm that a new statistics committee was at work to organize statistics on the production and commerce of the country, to promote Brazil's value abroad by making known to the world what the country has to offer.⁵²

Reports in subsequent years leading up to the final 1872 deadline for adoption contained a variety of observations, problems, and concerns. The ministry relied on cooperation of provincial presidents to submit existing sets of weights and measures so that the ministry officials could calculate the equivalencies and create and circulate the tables for their translation, cooperation that was slow in coming. The provinces, in turn, were required to pay for the new metric standards, a curious provision for a major institutional change imposed by the central authority but apparently necessary because the Chamber of Deputies continued to allocate insufficient funds in annual budgets. Transportation difficulties were recognized as hampering collection of the old standards and dissemination of the new. New metric standards, arrived from

⁵⁰ Brazil. Ministry of Agriculture. Annual Report for 1862. Anexo A, p. AA3

⁵¹ Brazil. Ministry of Agriculture. Annual Report for 1862, p 13

⁵² Brazil. Minister of Agriculture. Annual report for 1867, p. 155

France, had no place to be housed and therefore had gone uninspected. By 1868, though, the metric system was being used regularly in the customs houses and in some government offices, and the minister had reduced his hopes of full implementation to “if not all the Empire, at least in its principal markets, where it will then be easy to carry its execution to the most remote and central stops.”⁵³

A major impediment to the implementation of this system was Brazil’s involvement in the Paraguayan War, which consumed most of the state’s attention and resources.⁵⁴ By 1869, when the war was essentially won, the Minister of Empire confessed that “the ten-year deadline set in Law 1157 of 26 June 1862 for the substitution of the system of weights and measures in the Empire is almost here, and ... little has been accomplished for the effective execution,” he named a new oversight committee to expedite the transition.⁵⁵ Headed by Guilherme Schüch, this committee took the step of finally deciding which form of metric patterns would be used in Brazil (!) and which foundry would supply them. The winning form was that used in the Germanic Confederation, and the order was placed by the Brazilian Minister in Berlin, Conselheiro Vianna de Lima, aided by Mr. Förster, head of the department of weights and measures of the German Empire and chair of the International Committee of Weights and Measures.⁵⁶ Dr. Conselheiro Vianna de Lima expedited the execution of the contracts, and the

⁵³ Brazil. Minister of Agriculture. Annual report for 1868, p. 54

⁵⁴ Richardson, *Quebra-Quilos*, 86

⁵⁵ Brazil. Minister of Agriculture. Annual report for 1868, p. 80

⁵⁶ United States. National Bureau of Standards. Department of Commerce . Weights and Measures: Volumes 8-9. . Bureau of Standards. S. W. Stratton, Director. Ninth Annual Conference of Representatives from Various States held at the Bureau of Standards, Washington, D.C., May 26, 27, 28 and 29, 1914. Washington. Government Printing Office, 1915. [this one volume has proceedings from eighth and ninth conferences. Forster is mentioned in the ninth, which begins on p. 303 of the Google book] “I had hoped to have with us to-day a gentleman who is one of the most distinguished scientists of Germany. He is president of the international conference, and also chairman of the International Committee of Weights and Measures—Prof. Forster, of Berlin. For many years he was director of the Normal-Eichungs Kommission, which is the institution in Germany having to do with weights and measures, and held this position when the metric system was adopted in Germany. He is now connected with the University of Berlin. [...] I have often heard him speak of what he went through during the adoption of the metric system in Germany. He has often said that is presented no very great difficulties so far as the ordinary commodities are

first shipments of the German patterns arrived in Rio in early 1872, with the balance of the shipment arriving by June. The first shipment, it was thought, would be sufficient for the majority of the municipalities, but there was no way to distribute the new patterns of the metric system throughout the Empire before the adoption deadline.⁵⁷ By 1871 it was clear that the deadline could not be met. The government passed a decree permitting an additional year for the transition, by which time all the municipalities of the Empire should possess the patterns of the new system for the calibration of measures used in commerce and in private transactions.

The annual report for 1872 presented to the Chamber of Deputies in 1873 reported that at long last the mechanisms were in place and the metric system conversion was underway—surprisingly, perhaps, without violence. The Minister of Agriculture wrote, “Law 1157 of 26 June 1862 is being implemented, if slowly, without the aversion or antipathy of the population.” In all, 580 sets of metric patterns had been received and distributed. Some remote municipalities had not yet received them, whether because of an oversight or a transportation problem, but the ministry was following up with provincial presidents. The minister proclaimed full satisfaction with the patterns received from Germany, and commended the work of those who made it possible: the Brazilian Minister in Berlin, the German liaison Mr. Förster, and the metric conversion committee president Guilherme Schüch.⁵⁸

concerned. [...] He is 84 years old, is still actively engaged in weights and measures work, and takes the keenest interest in weights and measures affairs all over the world.” P. 14 (p. 316 of the google book)

⁵⁷ Brazil. Ministry of Agriculture. Annual report for 1871, pp 55-56. Annex T contains the 1871 law that creates the funding to order and import the weights and measures. It details what types of patterns a “set” consists of, and specifies three different classes, first, second, and third, in decreasing levels of complexity and material. First class sets include more than 30 items of varying weights and capacity; second class sets include 16 items; and third class sets include 11 items. The total budget paid for 10 first class sets, 59 second class sets, and 509 third class sets, presumably according to the level of commercial sophistication in the municipalities that will receive them. This sums to 578 municipalities. I know from the 1872 census that there were 643 recorded. It is possible that the government wasn’t sure of the exact count in 1871 before the census was carried out, or that the other 65 municipalities were too small to warrant their own set or were close to another and planned to share.

⁵⁸ Brazil. Minister of Agriculture. Annual report for 1872, pp. 45-46.

The report of the metric conversion committee headed by Dr. Schüch published in annex to that same report was less glowing.⁵⁹ It reported that sets of weights and measures arrived but could not be easily distributed because of rain, the limits of mule transport (complete sets were heavy!), and yellow fever in Rio. The number of municipalities had grown since the order was placed in Germany, so many were left without sets. Public offices that lacked official sets were buying them on the open market, in violation of the law. And municipalities did not always have well-trained officials to store and properly use the standards, leading to breakage and degradation of the materials, not to mention fraud. Because all weights and measures now had to be verified against the official sets, which incurred a fee, prices to consumers were increasing, causing harm to the domestic economy. Finally, the law required municipal councils to pay for the acquisition of the patterns, but they did not make enough money to cover their normal expenses much less repay the government. This report worried that any new delay would undermine adhesion to the new system.

The concerns of the metric committee were borne out in reports for subsequent years. Every difficulty they highlighted, from transportation to remote location to cost to ability, surfaced in annual reports. New municipalities went without patterns, new patterns were ordered and delivered from Germany to keep up with this need, fees were waived, patterns were stored with such carelessness that they quickly needed to be replaced, and so on. In spite of the incomplete roll out of the metric system, Brazil's commitment to the change was affirmed at home and abroad when it became a signatory to the Treaty of the Meter at the 1875 the International Convention of the Meter held in Paris.⁶⁰

⁵⁹ Ibid, Annex H.

⁶⁰ The International Bureau of Weights and Measures (BIPM) was also created at this conference. Source: Documents Diplomatiques de La Conférence du Metre. Paris, Imprimerie Nationale, 1875. <http://www.bipm.org/en/worldwide-metrology/metre-convention/official-texts/>

By the end of the 1870s, the biggest challenge reported by the ministry was its ability to keep up with the growing number of municipalities, not resistance to the new system. In 1882 it reported that “the new system of weights and measures is generally accepted and in use, though numerous locations of the interior cannot be said to be completely transformed from the old regime.” And in 1883 it affirmed that “every day the use of the new system cultivates the practices [*costumes*] of the people even though the old weights and measures still have not been completely abandoned in numerous locales.”⁶¹

The last time the metric system was mentioned in anything deeper than a brief recapitulation of new orders of pattern sets was in 1884, a little more than a decade after the hurried distribution of the German standards to every municipality in the Empire. In a reflective mood, the Minister of Agriculture wrote, “It has been little more than a year since the need was recognized to reiterate orders that [public] offices and functionaries abstain from the use of designations other than those of the new system; this fact serves as an example of how much time is needed to ensure that the use of this kind of reform is completely discontinued. In spite of the natural obstacles, however, the use of the decimal metric system has become widespread.”⁶² Indeed, the following year’s annual report was the last one that mentioned the system for any reason. If we circle back to the scholarship about the ineffectual imperial state in evidence in the original 1852 census attempt, it seems that the state had managed to extend its reach through persistence three decades later.

Standardization: beyond Quebra Quilos

While ministry reports documented the fits and starts of the conversion to the metric system, this implementation did *not* spark revolt throughout the nation, something that is rarely

⁶¹ Brazil. Ministry of Agriculture. Annual report for 1881, pp. 59-60, and annual report for 1882, p. 140.

⁶² Brazil. Ministry of Agriculture. Annual report for 1883, pp. 43-44.

mentioned in scholarly accounts of the 1870s. The southern provinces, for instance, accepted the transition to the metric system peacefully. So peacefully, in fact, that the ministry in charge of its implementation--the Ministry of Agriculture, Commerce, and Public Works--dispatched a functionary to find out why the absence of revolt. Was it because the new law was not being imposed by officials on their population? In his 1875 lengthy report, the author, Luiz Joaquim de Oliveira, uncovered a series of problems with the implementation of the metric system, but none of them involved popular repudiation or unrest.⁶³ More mundane issues prevented the full implementation of the new weights and measures. He found varying degrees of compliance, and many reasons for its lack. Where compliance was greatest, he commented favorably on the good will or even zeal of local authorities in complying with the law, caring for the standards by which local scales and measures were inspected, and the level of education and professionalism of the *aferidor*, or inspector, whose responsibility it was to verify the weights and measures in use in the local economy. The failure to implement the new system, or the coexistence of old and new, was due to a host of reasons that included passive resistance by the municipal authorities, poor training or lack of understanding of new system by the *aferidores*, poor storage and maintenance of the new metric standards, and occasionally because a municipality had not received the new standards. In these cases, municipalities got by with a mix of the old and the new, violating both the nineteenth-century embrace of uniformity and precision and the Brazilian laws and decrees adopting the metric system.

The good will of the municipal councils throughout Brazil was essential for the successful adoption of the metric system, for the annual inspection of weights and measures was

⁶³ Brazil. Ministry of Agriculture. "Relatorio apresentado á Assembléa Geral Legislativa na quarta sessão da decima quinta legislature pelo Ministro e Secretario de Estado dos Negocios, da Agricultura, Commercio e Obras Publicas, José Fernandes da Costa Pereira Junior em 2 maio 1875. Annex 6, "Systema Metrico." Rio de Janeiro: Typographia Americana, 1875.

done at the municipal headquarters. The Brazilian government, in anticipation of the final implementation of the law, had ordered a set of metric weight and measures standards from Germany for distribution to all municipalities, which needed to have appropriate space to install and use them. The municipality of Cachoeira, Rio Grande do Sul was praised for maintaining its set of standards “in a perfect state of conservation, with the scales conveniently installed.”⁶⁴ This municipality was the model of inspection: it was regularly done, the weights and measures used conformed to the law, the inspector, a public teacher, was well trained, and the municipality was zealous in the adoption of the new system. The Villa de S. Jeronymo also had a teacher as its weights inspector, which held with their fairly good adherence to the new system, but this teacher refused to inspect cylindrical weights when they came in over or under the metric standard because he wasn’t sure how to make the adjustments, an attitude Sr. Oliveira attributed to laziness passed off as ignorance. Another municipality, S. José do Norte, lacked a good inspector but knew this and named a new person willing to be trained to execute the job.

Over the course of these travels, Sr. Oliveira found that there was no evidence of the riots and demonstrations that in the Northeastern provinces had led to smashing the scales and to raiding and destroying public notarial offices. In Porto Alegre, for example, a sort of passive resistance driven by indifference to the new system or the inconvenience of enforcing it was the major impediment: “The adoption of the metric system,” he found, “is resisted through the lack of effort by the municipal council.”⁶⁵ Taquary and Rio Grande both had the new set of standards well kept in a good state of conservation, but its inspector did not know how to properly inspect weights and measures of the new system. In Rio Grande, he observed,

⁶⁴ “Relatorio apresentado...” Annex 6, “Systema Metrico” p.A 6-4.

⁶⁵ “Relatorio apresentado...” Annex 6, “Systema Metrico” p.A 6-2.

The municipality is perhaps the locale where there is the greatest diversity in the weights of the metric system, from the old system and even from unknown systems. In the public market I observed that weights formed from folded sheets of lead were used on scales that were rebuked by the law. The use of these scales extends to many a house of business. The president of the council promised me to put an end to the abuses that I pointed out.⁶⁶

These municipalities mixed old systems and new, such that the metric system was being only irregularly employed.

A practical impediment to implementation that affected many of the municipalities visited on this inspection tour was of the most basic sort: the lack of a good quality set of the new standards. The Brazilian government had ordered enough sets from Germany to supply every municipality in the country with a set of metric weights and measures, but the number of municipalities grew in the decade across which the system was implemented. This, apparently, was news to Sr. Oliveira. He learned upon visiting the municipality of S. Leopoldo that it had requested the sets more than once, the last time being two years before this inspection, but had not received them. The reason given by the municipal secretary and *procurador*, or town tax collector who also served as the weights inspector, was that the provincial treasurer demanded a payment for the set that the municipality could not afford. Sr. Oliveira noted in his report,

I pondered that many municipalities had received their standards without paying for them, and that I found the demand made to S. Leopoldo surprising. The procurador went to the capital that same day and, on the following, received all the containers with the standards of weight and measure which were in the customs house. That is how the muni came to possess its standards on the 16th of January.⁶⁷

Other municipalities had received their sets, but had not stored them properly. He found some were exposed to the elements and deteriorating, in the early stages of oxidization. Many councils had no room dedicated for their storage and use, leading to their degradation. This was one

⁶⁶ Ibid, A6-7 and A6-8

⁶⁷ Ibid, A6-3 and A6-4.

symptom of the ignorance that underlay most of the problems with implementation. Local officials were poorly trained in their proper care and use, resorting to old standards and old practices instead. He found that, whether because of ignorance or convenience, the old system was still commonly used.

The reports that resulted from these travels through the municipalities of the southern provinces made several recommendations to improve adoption to the new system. First and foremost was to make sure that all municipalities that lacked an official set of the new standards receive them immediately. The laws and regulations should be published in the official newspapers and disseminated through broadsides and municipal newspapers to spread awareness of the new system, and municipal administrators should be provided official standards for length, weight, and volume and that the inspectors be educated in their proper storage and usage. One of the greatest impediments to its implementation was a basic understanding of what the values were and how to measure them. Moreover, the government needed to organize fee tables for the inspection of weights and measures throughout the empire, the absence of which had caused a fair amount of discord, to guarantee the inspectors sufficient pay for their task to improve their performance. The lax or poor quality of inspection, he hypothesized, was their poor remuneration; the professionalization of their work was of utmost importance to successful and widespread adoption.

Longer term, to improve oversight, Oliveira proposed that a permanent commission on weights and measures be formed that had sufficient personnel to inspect the practice of the metric system throughout the provinces. The government should adopt a policy of zero tolerance for the continued use of old weights and measures, but this had to begin with public offices like customs houses that were not in compliance. The public offices must follow the practice and lead

by example. Ideally, they would stop referring to the old measures entirely, to uproot the habit of comparing the metric measurements to the old system, which had never been uniform. Finally, he recommended that the metric system be introduced into the public schools by producing and distributing pictures that represented the units of weights and measures visually, “to fix in the spirit of the children the idea of the greatness and of the legal shapes of the new measures.”⁶⁸

Concluding thoughts

The working hypothesis of my new book “1872: Standardizing the Brazilian Nation,” of which this paper is a first step, is something expressed by statisticians of the nineteenth century: In the absence of standards of weights and measures, exchange was difficult. In the absence of statistics about population and its economic activity, public policy to allocate works and stimulate domestic development was blind. The modernizing bureaucrats of the Brazilian state recognized these limitations and tried to remedy them through these reforms. It turns out that introducing a better system to improve exchange was also difficult because it requires large scale technological change and behavioral changes. The research that exists on this topic is usually told from the perspective of the peasants with colloquial understanding of economic exchanges who rebelled against the intrusion of the state into rustic life, ala the 1970s peasant revolt studies of Eric Hobsbawm. That is certainly a part of the story of the quebra quilos revolts in the northeast, but the traveler’s account of the introduction of weights and measures in southern Brazil suggests that those revolts were not widespread and that failures of implementation were for far more mundane reasons that the literature suggests. The degrees of resistance to the metric system throughout the southern provinces had little to do with an ideological or emotional rejection of the expanding role of the state; they were more directly tied to the logistical

⁶⁸ “Relatorio apresentado...” Annex 6, “Systema Metrico” p.A 6-20.

difficulties, poor understanding, insufficient remuneration, or physical deterioration of the standards. Those instances, too, show that the state had “a big head but very short arms”, yet the municipalities generally complied with its authority. This regional difference is intriguing, and is the impetus for my new research into standardization of the Brazilian state and its impact on the integration of the domestic economy.

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