

## A CONFOUNDED STATISTIC: *Turn-of-the-Century Mexican Agriculture in Incommensurable Terms*

**ABSTRACT:** In 1899, municipal officials throughout Mexico sent tables of agricultural statistics to Mexico City to assist in the preparation of a special publication for the 1900 Paris Universal Exposition, where the Mexican government hoped it would impress the world with Mexico's modernity and potential. Though the activity was nothing new, the ways in which municipal officials provided the requested information confounded the national project of both understanding and representing the Mexican countryside. The statistics were never published. This article serves as an introduction to a new dataset and collection of maps built from transcriptions of the manuscript tables. It also demonstrates that regular participation in statistical undertakings served as a means for provincial Mexicans to complicate and confound the process of state consolidation. Here I see, rather than refusal or rebellion, ready participation in state knowledge projects as another way in which those beyond Mexico City managed their relationships with President Porfirio Díaz's technocratic government. Engaging with conceptions of governmentality on one side and data management on the other, I use the 1899 agricultural statistics to highlight how unruly participation in data collection frustrated the practice's centralizing and standardizing project.

**KEYWORDS:** Mexico, statistics, agriculture, state building, data, Porfiriato

The late nineteenth century was awash in numbers. For French sociologists investigating public health, Ottoman bureaucrats tallying agricultural outputs, US American progressives arguing for educational reforms, and Mexican *científicos* quantifying the natural resources of their landscape, modernizing meant making use of statistics. The discipline was still in formation and its methodological and theoretical underpinnings still in their adolescence, but statistics had become a much relied on means of making an

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argument, demonstrating success, or portraying an opportunity. Its evolution was by no means solely a European enterprise.<sup>1</sup> As new republics dedicated to the promotion of individual rights and generalized prosperity, Latin American nations found tools to account for and make use of population and resources quite appealing. Statistical societies proliferated across the Americas, and government offices and their civil society counterparts published endless volumes of surveys and tables. Newspapers ran thick with rows and columns.

In the midst of this torrent, the Mexican Agricultural Society approached the Mexican government's Departamento de Fomento (Development) with a proposal to create a new, statistics-based portrait of the nation's agriculture for inclusion in Mexico's contributions to the 1900 Paris Universal Exposition.<sup>2</sup> Together, progress-minded farmers and bureaucrats decided to use the occasion of a world's fair to overcome past discrepancies in data collection and to represent Mexico's rural regions as full of productivity and potential.<sup>3</sup> Statistics would be the way to foreign investors' pocketbooks and market baskets. Simultaneously, they could provide the national government with a consolidated and commensurate description of its rural spaces. Yet, while Mexico sent plenty of publications to Paris, the proposed statistical portrait of the country's agricultural undertakings was not among them. The forms that municipal officials received and filled out by hand and sent on to Mexico City were filed away, and the project, never completed, was mentioned only briefly in official reports.

1. Jean-Claude Perrot and Stuart Woolf, *State and Statistics in France, 1789–1815* (Chur, Switzerland; New York: Harwood Academic Publishers, 1984); Theodore M. Porter, *The Rise of Statistical Thinking, 1820–1900* (Princeton: Princeton University Press, 1986); Silvana Patriarca, *Numbers and Nationhood: Writing Statistics in Nineteenth-Century Italy* (New York: Cambridge University Press, 1996); Leticia Mayer Celis, *Entre el infierno de una realidad y el cielo de un imaginario: estadística y comunidad científica en el México de la primera mitad del siglo XIX* (Mexico City: El Colegio de México, 1999); J. Adam Tooze, *Statistics and the German State, 1900–1945: The Making of Modern Economic Knowledge* (Cambridge; New York: Cambridge University Press, 2001); Eli Cook, *The Pricing of Progress: Economic Indicators and the Capitalization of American Life* (Cambridge: Harvard University Press, 2017); Aaron G. Jakes, *Egypt's Occupation: Colonial Economism and the Crises of Capitalism* (Redwood City: Stanford University Press, 2020); Nada Mountaz, *God's Property: Islam, Charity, and the Modern State* (Oakland: University of California Press, 2021), <https://doi.org/10.1525/luminos.100>.

2. Iniciativa de la Sociedad Agrícola para formar un cuadro de estadística agrícola, 1898, Archivo General de la Nación [hereafter AGN], Fomento y Obras Públicas: Exposiciones Extranjeras y del País [hereafter Fomento y Obras Públicas: Exposiciones], caja 67, exp. 7.

3. On Mexico's positivist project of order and progress, see Leopoldo Zea, *El positivismo en México* (Mexico City: El Colegio de México, 1953); Oscar R. Martí, "Introduction," *Aztlán: A Journal of Chicano Studies* 14:2 (November 1, 1983): 209–220; Charles A. Hale, *The Transformation of Liberalism in Late Nineteenth-Century Mexico* (Princeton: Princeton University Press, 1989); Gregory D. Gilson, *Latin American Positivism: New Historical and Philosophical Essays* (Lanham, MD: Lexington Books, 2013); John Corr, "The Enlightenment Surfaces in Nineteenth-Century Mexico: Scientific Thinking Attempts to Deliver Order and Progress," *History of Science* 52:1 (March 2014): 98–123, 125; and Natalia Priego, *Positivism, Science and "The Scientists" in Porfirian Mexico: The Philosophy of Herbert Spencer in the Historiography of Mexico* (Oxford: New York: Oxford University Press, 2016).

However, the collection of agricultural statistics undertaken as the *Estadística Agrícola de la República* was not a failed project, even if its specific aim was not met. Instead, the survey made for the Paris Exposition was just one moment of dialogue in an ongoing conversation between national officials and rural Mexicans about the terms of their relationship and the present and future of Mexico's agrarian landscape. Using the tables completed by survey respondents as the source base, I demonstrate that in their regular participation in statistical undertakings, the governed complicated and confounded the process of state consolidation. But rather than refusal or rebellion, I see their ready participation in state knowledge projects as an important way in which those beyond Mexico City managed their relationships with increasingly technocratic governments. Rather than acquiescing to state-imposed categories and definitions, local officials insisted on the incommensurability of their agrarian worlds with the export-oriented projections made by bureaucrats as they completed their tables.<sup>4</sup> Though Spanish was the shared language of (almost) all parties involved in the effort to collect agricultural statistics, they did not necessarily share social and economic understandings. *Científicos*, as Mexico's technocrats were known during the three-decade long presidency of Porfirio Díaz (1876-1910), sought to rationalize what they learned of the countryside in service of their own views of a unified and modern Mexico well integrated into global markets. Rural Mexicans, in turn, frustrated the survey process by writing outside the lines and reworking standardized columns and rows to hold the reality they lived (see [Figures 1 and 2](#)).

As the “science of the state,” statistics as a practice and a product invites analysis by scholars seeking to understand state-building. Statistical surveys, census tables, and compendia of national data provide windows into how state actors imagined and represented their polities. Column headings, questionnaire subheadings, and multiple-choice options show us the discourse—whether of production, civil status, or political engagement—as bureaucrats and their allies sought to delimit it. Whether applied in Michel Foucault's conception of governmentality or highlighted in James C. Scott's depiction of overconfident high modernists undermining their own projects, statistics are key to

4. The concept of incommensurability, as taken up by philosophers of science, sociologists, anthropologists, and others, represents the profound disconnection between world views that makes the direct translation or conflation of certain concepts or outlooks impossible. For a few examples of the long and growing anthropological and sociological discussion of comparison as a social process, with recent scholarship particularly interested in the ways this intersects with decolonial methodologies, see Wendy Nelson Espeland and Mitchell L. Stevens, “Commensuration as a Social Process,” *Annual Review of Sociology* 24 (1998): 313–343; Elizabeth A. Povinelli, “Radical Worlds: The Anthropology of Incommensurability and Inconceivability,” *Annual Review of Anthropology* 30 (2001): 319–334, <http://dx.doi.org/10.1146/annurev.anthro.30.1.319>; Marisol de la Cadena, “Indigenous Cosmopolitics in the Andes: Conceptual Reflections beyond ‘Politics,’” *Cultural Anthropology* 25:2 (2010): 334–370, <https://doi.org/10.1111/j.1548-1360.2010.01061.x>; and Matei Candea, *Comparison in Anthropology: The Impossible Method*, New Departures in Anthropology (Cambridge: Cambridge University Press, 2018), <https://doi.org/10.1017/9781108667609>.

FIGURE 1

“In this municipality, the data referred to in this survey does not exist, as there is no one occupied in agriculture because of the lack of irrigation and only a few residents do a small amount of rainfed planting to help with their subsistence.” (*No hay en este Municipio los datos a que se refiere esta voleta [sic], pues no hay quien se ocupe en la agricultura por la falta de regadío y solamente unos cuantos vecinos hacen algunos [sic] pequeños sembrados de temporal para ayudar a su subsistencia.*) Incomplete table from Casas, Tamaulipas, June 9, 1899. Archivo General de la Nación, Fomento y Obras Publicas: Exposiciones Extranjeras y del País. Caja 51, exp. 8.

**Comisión Mexicana para la Exposición de Paris en 1900.**

GRUPO VII.  
ESTADÍSTICA AGRÍCOLA DE LA REPÚBLICA.

Municipalidad de *Casas*      Distrito, Partido, etc., de *San Carlos*      Estado de *Tamaulipas*

NOMBRE de cada hacienda ó rancho.	TIPO DE CULTIVO DE ELLOS.	CLIMA.	AGRICULTORES que los cultivan.	VALOR de los productos de los cultivos.	VALOR de los productos de los animales.	VALOR de los productos de las industrias.	VALOR de los productos de las artes.	MATERIAS PRIMAS Y PRODUCTOS MANUFACTURADOS, etc.		MATERIAS PRIMAS Y PRODUCTOS MANUFACTURADOS, etc.		MATERIAS PRIMAS Y PRODUCTOS MANUFACTURADOS, etc.	
								VALOR	VALOR	VALOR	VALOR	VALOR	VALOR
<p><i>No hay en este Municipio los datos a que se refiere esta voleta, pues no hay quien se ocupe en la agricultura por la falta del regadío y solamente unos cuantos vecinos hacen algunos pequeños sembrados de temporal para ayudar a su subsistencia.</i></p> <p style="text-align: right;"><i>Casas, Tamaulipas, 9 de Junio de 1899.</i> <i>José López</i> <i>[Signature]</i></p>													

understanding the role of abstraction and rationalization in the consolidation of state power.<sup>5</sup> Writing of France’s Second Republic, Joan Wallach Scott reminds us that statistical reports “provide valuable insight into the processes by which relationships of power are established, exemplified, challenged, and enforced.”<sup>6</sup>

5. Michel Foucault, *The Foucault Effect: Studies in Governmentality* (University of Chicago Press, 1991); James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998).

6. Joan Wallach Scott, “A Statistical Representation of Work,” in *Gender and the Politics of History* (New York: Columbia University Press, 1999), 115.

FIGURE 2

Completed table from Jiménez, Tamaulipas. Archivo General de la Nación, Fomento y Obras Publicas: Exposiciones Extranjeras y del País. Caja 51, exp. 8.

Comisión Mexicana para la Exposición de Paris en 1900.  
 GRUPO VII.  
 ESTADISTICA AGRICOLA DE LA REPUBLICA.  
 Municipio de *Jiménez* Estado, *Panhuén*, al *Corre*, *Sancti*, *de*, *enero*, *de*, *Tamaulipas*

NOMBRE de cada hacienda ó rancho.	VALOR DE CADA UNO DE ELLOS.	CANTIDAD.	CLIMA.	ESTEROSIDAD.	VALOR		APLICACION E INSTRUCCION.	
					DE CADA UNO DE ELLOS.	DE CADA UNO DE ELLOS.	DE CADA UNO DE ELLOS.	DE CADA UNO DE ELLOS.
<i>El Salgado</i>	<i>15283</i>							
<i>La Merced</i>	<i>2750</i>							
<i>San Mateo</i>	<i>1670</i>							
<i>San Mateo</i>	<i>3000</i>							
<i>San José</i>	<i>972</i>							
<i>El General</i>	<i>1575</i>							
<i>de San</i>	<i>178</i>							
<i>de San</i>	<i>165</i>							
<i>de San</i>	<i>193</i>							
<i>El Puerto</i>	<i>1738</i>							
<i>Los Cuernavaca</i>	<i>376</i>							
<i>El Cero</i>	<i>769</i>							
<i>El Cero</i>	<i>265</i>							
<i>El Cero</i>	<i>2360</i>							
<i>San Mateo</i>	<i>1300</i>							
<i>El Salgado</i>	<i>1596</i>							
<i>La Merced</i>	<i>2420</i>							
<i>San Mateo</i>	<i>4790</i>							
<i>de San</i>	<i>257</i>							
<i>Agua Prieta</i>	<i>2570</i>							
<i>El Cero</i>	<i>1773</i>							
<i>San Mateo</i>	<i>1930</i>							
<i>San Mateo</i>	<i>1725</i>							
<i>San Mateo</i>	<i>1570</i>							
<i>San Mateo</i>	<i>228</i>							
<i>San Mateo</i>	<i>2417</i>							

Acknowledging that the political power of statistics is inherent not only in their tabulation and deployment, but also in the construction of data collection instruments, historians nonetheless largely make use of statistics by way of published tables. Generally typeset in neat rows and columns, processed survey results are what we can access. Reading for the implications embedded in column headers or the contents of the cells and summations, scholars working with published compendia start from the finished product rather than its constituent parts. Beyond the basic source constraint, most historians want to do something with the assembled numbers and figures, “to actually employ the statistics we know to be historically constructed as tools for dissecting historical reality” as Adam Tooze puts it.<sup>7</sup> Even as we acknowledge the political and

7. Tooze himself writes about the construction of statistics in Weimar Germany, though still primarily from the perspective of the central state and its statisticians, rather than from the perspective of those providing the requested information. See Adam Tooze, “Trouble with Numbers: Statistics, Politics, and History in the Construction of Weimar’s Trade Balance, 1918–1924,” *American Historical Review* 113:3 (June 2008): 280, <https://doi.org/10.1086/ahr.113.3.678>.

incomplete nature of our source base, we still take the data as the best we have and move forward from a baseline (sometimes grudgingly accepted) of acting as though the numbers were neutral and objective.<sup>8</sup>

The fact that the dataset of agricultural statistics I deal with in this article is unpublished forces me to grapple with its historical construction. The work of transcribing and standardization that my research assistants and I undertook as we digitized, analyzed, and mapped tables—all filled in by hand—represents the agricultural activity of almost 1400 municipalities and replicates the technocrats' work, albeit with the modern benefit of computerized spreadsheets and text analysis.<sup>9</sup> In creating a dataset, it was impossible to ignore the regular remaking of categories, definitions, and priorities by respondents. Building on Jessica Marie Johnson's conceptualization of the "null value" as a means of making space for those left out of or dehumanized by data collection in the context of the transatlantic slave trade, my work with the 1899 agricultural statistics seeks to highlight how unruly participation in data collection frustrated the centralizing and standardizing aims of collecting those statistics.<sup>10</sup> The local officials refusing national categories were not subject to the same violence of enslavement that the Black women Johnson writes about were, and I acknowledge that borrowing and extrapolating from work on enslavement in other contexts must be done with care. By taking seriously how local officials handled the questions they received, leaving questions unanswered or reconfiguring or even rewriting the tables they were to complete, I show how data collection and enumeration served as part of an ongoing conversation, one with space for multiple kinds of agency and assertions of authority.

8. Mexican economic historians have worked hard to reconstruct historical series of trade and other statistics, at the same time acknowledging that the numbers they have to work from are inconsistent at best. El Colegio de México, *Estadísticas económicas del Porfiriato: comercio exterior de México, 1877–1911* (Mexico City: El Colegio de México, 1960); Marcello Carmagnani, "Finanzas y estado en México 1820–1880," *Ibero-amerikanisches Archiv* 9:3/4 (1983): 279–317; Francie Chassen-López, "'Cheaper Than Machines': Women and Agriculture in Porfirian Oaxaca, 1880–1911," in *Women of the Mexican Countryside, 1850–1990: Creating Spaces, Shaping Transition*, Mary K. Vaughan and Heather Fowler-Salamini, eds. (Tucson: University of Arizona Press, 1994), 27–50; Sergio de la Peña and James Wilkie, *La estadística económica en México: los orígenes* (Mexico City: Siglo XXI, 1994); Sandra Kuntz Ficker, *El comercio exterior de México en la era del capitalismo liberal, 1870–1929* (Mexico City: El Colegio de México, Centro de Estudios Históricos, 2007); Sandra Kuntz Ficker, *Las exportaciones mexicanas durante la primera globalización, 1870–1929* (*Estudios Históricos*) (Mexico City: El Colegio de México, 2009); and Paolo Riguzzi, "From Globalisation to Revolution? The Porfirian Political Economy: An Essay on Issues and Interpretations," *Journal of Latin American Studies* 41:2 (2009): 347–368. See the annotations on figures and appendices in Emilio H. Kourí, *A Pueblo Divided: Business, Property, and Community in Papantla, Mexico* (Stanford: Stanford University Press, 2004); Casey Marina Lurtz, *From the Grounds Up: Building an Export Economy in Southern Mexico* (Stanford: Stanford University Press, 2019); and Paul Gillingham, *Unrevolutionary Mexico: The Birth of a Strange Dictatorship* (New Haven: Yale University Press, 2021), 164–166.

9. The dataset is available at <https://caseylurtz.com/agricultural-statistics> and will be published to the ArchivoMex website (<https://mx.digital>) and made available via the Inter-University Consortium for Political and Social Research (ICPSR). The municipal and district shapefiles used to map the data will be published as a feature layer in the ArcGIS Living Atlas and made available in an open source format at <https://caseylurtz.com/agricultural-statistics>.

10. Jessica Marie Johnson, "Markup Bodies: Black [Life] Studies and Slavery [Death] Studies at the Digital Crossroads," *Social Text* 36:4 (137) (December 1, 2018): 57–79, <https://doi.org/10.1215/01642472-7145658>.

Never tabulated or published, the handwritten collection of agricultural statistics in some ways themselves became a null value, their complexity and local officials' refusal to accept abstractions papered over by científicos with broad narratives and visual representations of export-oriented production on a large scale. By returning to the handwritten tables sent in by municipal officials and granting them the space they demanded, I show the ongoing process of negotiating what productive agriculture meant in Mexico at the turn of the century.

The article begins with a short foray into the history of statistics as a practice in Mexico, clarifying that those who provided information always had a hand in defining its terms and tenor. Subsequent national governments may have embraced the potential of statistics as a tool of state consolidation, but they could never force the people they sought to govern into regimented rows and columns. Instead, they published long-form transcriptions of survey results alongside or in lieu of polished tables. For my analysis, I turn to the 1899 agricultural statistics themselves. Scholars have rarely consulted these tables for the same reasons that Fomento never published them: they are a disparate, disorganized, and disconcerting mess. Tucked away as they are in the foreign expositions section of the national archive, rather than any *fondo* specifically dedicated to agriculture, I first encountered the surveys on Mauricio Tenorio-Trillo's advice, and it has taken many years and the work of numerous research assistants and data services librarians to shape the aggregate into something resembling a publishable statistical table.

Here, I draw on both the aggregate abstractions made possible by data cleaning and geospatial visualization and the messy, unwieldy originals to illuminate how data provided by local officials was a means of undermining the projection of progress and order emanating from Mexico City. Instead of a landscape defined by large-scale haciendas growing single crops for export, the statistics portray the persistence of multiple types of production and the continued importance of subsistence. Taken together, the statistics elucidate the different ways that local officials understood modernizing projects as applied to their own landscapes. In filling out and returning the tables they were sent, municipal presidents and secretaries acknowledged and acquiesced to a project of state knowledge-making. Yet, when asked to represent a particular kind of capitalist endeavor in their responses, half of them refused. Their responses to questions on land use, labor, tools and machinery, and value all insisted that the countryside as the government in Mexico City sought to portray it did not in fact exist.

State consolidation is a process, governmentality an ongoing discourse involving no singular authoritative actor. The 1899 attempt at a definitive set of agricultural

statistics for Mexico makes clear that modernity meant both a desire for standardized data and the continued confounding of that dream. Municipal officials took part in state knowledge projects that asserted a unified vision of Mexico, but as they did so, they stubbornly insisted on answering questions in such a way as to capture and represent their own understanding of rural realities. Here, local officials' descriptions of their agricultural production bring to the fore how their participation, however willing, could nonetheless confound the process of creating a standardized, commensurable set of categories to represent the nation. Questions of incommensurability in tension with standardization allow us to see the friction of state-making as it happened.

## A BRIEF HISTORY OF MEXICAN STATISTICAL PRACTICES

When the Mexican Agricultural Society proposed to contribute “a statistical table of the Republic, original and unedited, that presents the state of our agriculture with the greatest exactitude possible given the difficulties that this Secretariat well knows” for the 1900 Paris Exposition, the modernizing farmers and policy-makers behind the project situated it in a long trajectory of contested knowledge production and accumulation in the country.<sup>11</sup> Founded in 1879, the Agricultural Society was a private promotional organization that brought together bureaucrats (the first honorary president was Mexico's then secretary of finance), agronomists, and planters.<sup>12</sup> The society collected scientific findings, distributed market information, and sent endless questionnaires about the state of and prospects for Mexico's countryside, publishing a monthly bulletin to distribute their collective findings. When it came to representing their undertakings on the world stage at the Paris Exposition, specimens and

11. Tenorio-Trillo's work on Mexico's participation in world's fairs makes clear that statistical undertakings were commonplace in the period, representative of a global drive for modernity as ordered and rational, to be “easily grasped by both nationals and foreigners.” Mexico's world's fair participation is quite well studied, and the Mexican elites who took charge of these exhibits well understood the acts of narration and invention in which they were engaged. World's fairs were not places where Mexico played at being modern or imitated the modernity of other nations. Rather, they were places where Mexico, along with nations from across Europe, the Americas, and East Asia, took part in the making of modernity. Statistics were just one part of this. Mauricio Tenorio-Trillo, *Mexico at the World's Fairs: Crafting a Modern Nation* (Berkeley: University of California Press, 1996), 42; Paolo Riguzzi, “México próspero: las dimensiones de la imagen nacional en el Porfiriato,” *Historias* 20 (1988): 137–157; Mauricio Tenorio-Trillo, “World's Fairs and Their Seven Daily Sins: An Epilogue,” in *Identity and Universality/Identité et Universalité [A Commemoration of 150 Years of Universal Exhibitions/Commemoration de 150 Ans d'Expositions Universelles]*, Volker Barth, ed. (Paris: Bureau International des Expositions, 2002), 177–189; Shelley E. Garrigan, *Collecting Mexico: Museums, Monuments, and the Creation of National Identity* (Minneapolis: University of Minnesota Press, 2012); Fabiola Martínez Rodríguez, “Representing the Nation: Art and Identity in Porfirian Mexico,” *National Identities* 15:4 (December 2013): 333–355, <https://doi.org/10.1080/14608944.2013.811225>; Alejandra Uslenghi, *Latin America at Fin-de-Siècle Universal Exhibitions: Modern Cultures of Visuality* (New York: Palgrave MacMillan, 2016); Iniciativa de la Sociedad Agrícola para formar un cuadro de estadística agrícola, 1898, AGN, Fomento y Obras Públicas: Exposiciones, caja 67, exp. 7.

12. Sociedad Agrícola Mexicana, *Estatutos de la Sociedad Agrícola Mexicana aprobados por la junta general el 26 de setiembre de 1879*. (Mexico City: Gonzalo A. Esteva, 1879).

examples of Mexico's raw and industrial products were well and good, but not sufficient. Published data was another key marker of the country's advancement and the way to attract foreign capital and immigrants alike. Along with civil society organizations like the Mexican Academy of Jurisprudence and Legislation, the Geological Institute, the National Museum, and the Mexican Pharmaceutical Society, the Agricultural Society promised to deliver a useful collection of previously published materials as well as a compendium of newly collected data that would describe and promote their country's current prosperity and future promise.<sup>13</sup>

The officials in charge of Mexico's pavilion at the Paris Exposition quickly agreed to the society's project, with the caveat that the effort should not replicate work already being done by the country's General Office of Statistics (Dirección General de Estadística), to avoid extra work on the part of those providing the data. Housed within the Department of Fomento, a government ministry that directed projects related to modernization and promotion, the bureaucrats designing and assembling Mexico's contribution to the Paris Exposition asserted that when they received agricultural data from the proposed survey they would then integrate it with data already held by the General Office.<sup>14</sup> Even as Fomento officials and Agricultural Society members promoted their new undertaking, they also acknowledged prior data collection efforts, as well as their deficiencies and difficulties. The new survey would overcome past challenges and represent a cohesive and coherent picture of Mexico's agricultural present and future. At the same time, all involved recognized the country's statistical undertaking as a work in progress—a conversation between Mexico City and the provinces in which the vocabulary was not yet settled.

The project of state comprehension and standardization that undergirded the agricultural survey had deep roots. Statistics as an academic and administrative field of expertise was still consolidating in the late nineteenth century, but attempts to catalog and advertise the diversity of New Spain's terrain, climate, populace, and products were commonplace in the colonial era as well. Such representations, whether in paintings, specimen cabinets, or municipal censuses, were used to argue for colonial subjects' capacity for self-governance, and eventually for their right to it, even as they erased the indigenous knowledge that had facilitated their collection and centered Mexico City and its environs.<sup>15</sup>

13. Mexico, Secretaría de Fomento, *Memoria 1897 a 1900*. (Mexico City: Secretaría de Fomento, 1908), 71.

14. Secretaría de Fomento to José Segura, February 11, 1899, AGN, Fomento y Obras Públicas: Exposiciones, caja 67, exp. 7.

15. Iлона Katzew et al., *New World Orders: Casta Painting and Colonial Latin America* (New York: Americas Society Art Gallery, 1996); Barbara E. Mundy, *The Mapping of New Spain: Indigenous Cartography and the Maps of the Relaciones*

With independence, politicians and bureaucrats joined the global move from natural history to state-led information management in the form of statistics. Whether in colonial holdings or new republics, governments took up statistics as the science of the state (its etymological definition) and sought to deploy the ongoing counting of people and resources in service of state functions. As Leticia Mayer Celis has written, Mexico's nineteenth-century statistical projects, including those mandated by the constitution of 1824, were part and parcel of a broad North Atlantic interest in creating a scientific view of society that could prescribe solutions rather than just describe the world as it was.<sup>16</sup> Prussia founded the first central statistical offices in the early 1800s, but Latin American nations were not far behind, with Mexico's Instituto Nacional de Geografía y Estadística established in 1833.<sup>17</sup>

These early offices existed as semi-autonomous organizations, situated at the intersection of the administrative state and a coterie of private promotional and scientific societies dedicated to creating, accumulating, and disseminating knowledge.<sup>18</sup> Latin American governments moved the functions of these disparate organizations, which had long provided them with data, fully inside their state apparatus around mid-century.<sup>19</sup> Mexico's statistical office was placed within the new Department of Fomento, or Development, at its creation in 1853. Fomento was a department dedicated to projects that would promote Mexico's economy and its profile, with offices on activities as varied as public works, colonization, scientific exploration, surveying, and publications. Statistical activities were right at home. Fomento's data collection and

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*Geográficas* (University of Chicago Press, 1996); Jorge Cañizares-Esguerra, *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World* (Stanford: Stanford University Press, 2006); Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution* (Austin: University of Texas Press, 2006); Rick A. López, "Nature as Subject and Citizen in the Mexican Botanical Garden, 1787–1829," in *Land between Waters: Environmental Histories of Modern Mexico*, Christopher R. Boyer, ed., Latin American Landscapes (Tucson: University of Arizona Press, 2012), 73–99; Casey Marina Lurtz, "Haciendo prosperar el edén en el siglo XIX en México," *ISTOR Summer* (2017): 51–67. On colonial censuses, see Sabrina Smith, "The People of African Descent in Colonial Oaxaca, 1650–1829" (PhD diss.: UCLA, 2018).

16. Mayer Celis, *Entre el infierno de una realidad y el cielo de un imaginario*, 46; Porter, *The Rise of Statistical Thinking, 1820–1900*, 18–23; Cook, *The Pricing of Progress*, 24.

17. Thomas Brambor and team count only autonomous state-run statistical offices, rather than those situated within other government departments. Even so, Latin American nations count among the early adopters, though Mexico does not appear until the 1880s. Brambor et al., "The Lay of the Land: Information Capacity and the Modern State," *Comparative Political Studies* 53:2 (February 1, 2020): 175–213, <https://doi.org/10.1177/0010414019843432>; Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990), 28–29; Mayer Celis, *Entre el infierno*, 83.

18. Mayer Celis, *Entre el infierno*, 83–84, 106–108.

19. Chile's Office of Statistics was founded in 1844, Venezuela's in 1871, and Peru's in 1873. Carmen Cariola Sutter and Osvaldo Sunkel, *Un siglo de historia económica de Chile 1830–1930*, Colección Imagen de Chile (Santiago de Chile: Editorial Universitaria, 1991), 20; Rafael Cartay Angulo, *Historia económica de Venezuela: 1830–1900* (Valencia, Venezuela: Vadell Hnos., 1988), 287; Carlos Contreras, *La economía pública en el Perú después del guano y del salitre: crisis fiscal y élites económicas durante su primer siglo independiente* (Lima: Banco Central de Reserva del Perú, IEP, 2012), 159.

reproduction activities proceeded in parallel with similar undertakings in the Secretaría de Hacienda (Department of Finance), until the Mexican Congress passed a law founding an independent General Office of Statistics in 1882.<sup>20</sup> Even as they gained stature, national offices continued to rely on private organizations and local governments for the bulk of their data while attempting to regulate and consolidate the terms and methods of its collection.

From ambitious projects like a national property registry to detailed surveys on the production of wine in each municipality, data collection became a regular means of interaction between provincial producers and representatives of the national government and its projects, whether within the administrative state or as adjunct to it.<sup>21</sup> From mid-century, municipal council minutes regularly recorded the receipt of new surveys or questionnaires along with instructions to the appropriate functionary to find, record, and return the requested information.<sup>22</sup> Mexico's national archive contains endless boxes of manuscript responses to such surveys, and administrative and organizational publications provide endless typeset transcripts of those pages, and more.<sup>23</sup> Even though statistical offices within various branches of government might have aspired to employing their own enumerators, municipal officials and private individuals with a penchant for promotion or study remained the primary source of data into the twentieth century. Transcriptions of the information they sent was

20. Mexico, Secretaría de Fomento, *Memoria del Ministerio de Fomento, Colonización, Industria y Comercio de la República Mexicana* (Mexico City: Imprenta de Vicente García Torres, 1857); Ana María Medeles, "La Ley del 26 de mayo de 1882 que constituyó a la Dirección General de Estadística," *Estadística e Sociedade* 4 (2016).

21. The Gran Registro was supposed to include every private property in the country as the culmination of a half-century of national projects to privatize landholding. It failed utterly, as property owners could not meet its heavy documentation requirements, or refused to take part altogether. See the various iterations of this project in Manuel Dublán and José María Lozano, *Legislación mexicana: ó, colección completa de las disposiciones legislativas expedidas desde la independencia de la República*, Vol. 12 (Mexico City: Imprenta del Comercio, de Dublán y Comp., 1882), 575–577; Mexico, Secretaría de Hacienda y Crédito Público, *Memoria de la Secretaría de Hacienda correspondiente al año fiscal de 1880 a 1881* (Mexico City: Tipografía de Gonzalo A. Esteva, 1881), 233; Mexico, Secretaría de Fomento, *Memoria presentada al Congreso de la Unión por el Secretario de Estado y del despacho de Fomento, Colonización e Industria de la República Mexicana corresponde a los años transcurridos de 1897 a 1900 y la gestión administrativa del señor ingeniero Don Manuel Fernández Leal*, 149–151; Mexico, Secretaría de Fomento, *Memoria presentada al Congreso de la Unión por el Secretario de Estado y del Despacho de Fomento, Colonización e Industria de la República Mexicana corresponde a los años transcurridos de 1905–1907* (Mexico City: Imprenta y fototipia de la Secretaría de Fomento, 1909), 83–85; Mexico, Secretaría de Fomento, *Memoria presentada al Congreso de la Unión por el Secretario de Estado y del Despacho de Fomento, Colonización e Industria de la República Mexicana corresponde a los años transcurridos de 1909–1910* (Mexico City: Imprenta y fototipia de la Secretaría de Fomento, 1910), lxx–lxxvi.

22. See for example Actas de Cabildo, January 16, 1899, Archivo Histórico de Monterrey, Fondo Contemporáneo, Sección Actas, exp. 1899/004: "Remite la misma Secretaría la Circular número 116, de esta misma fecha, relativa que se rinda por la Presidencia Municipal, una noticia de las principales producciones agrícolas habidas en este Municipio durante el año anterior a la Comisión de Censo y Estadísticas para que recoja los datos respectivos que deber formar la noticia expresada." ("The same Secretariat sent Circular number 116, on the same date, requesting that the Municipal Presidency submit information on the principal agricultural production of the municipality during the past year to the Commission of the Census and Statistics so that it can collect the respective data in order to create the referenced report.")

23. See most of the boxes at AGN, in the fondo Agricultura de Fomento y Obras Públicas, or any issue of the *Boletín de Agricultura, Minería e Industrias*.

republished in the monthly bulletins of organizations like the Agricultural Society or the Department of Fomento and circulated around the country and abroad to society members and government officials alongside articles on innovations in machinery, plant breeding, and markets.

People far from Mexico City willingly participated in the project of state information collection, but they did not always understand or represent their land or themselves in the terms provided by Mexico City technocrats and promoters. Local officials and farmers reinterpreted column headers and survey vocabulary, gently ridiculed Mexico City's expectations of what they were currently producing or could potentially produce, and provided answers that spilled across cells and blank spaces when a single number or word could not capture their reality. The editors of Fomento's monthly bulletins came to accommodate these dissonances, publishing the long-form responses to their surveys alongside or in lieu of tabular data by the 1890s.<sup>24</sup> Abstraction into the kind of clean dataset harnessed in modern statistics was not always possible or even desirable. Both those requesting data and those providing it recognized that nuance and detail had its value.

At the same time, tabular data and the calculations derived from it proliferated in government publications and the popular press. The concept of gross domestic product (GDP) was still decades in the future, but monetized data on production, yield, pricing, costs and standards of living, and more blunt measures of national wealth were in high demand.<sup>25</sup> Mexican bureaucrats attempted to calculate *riqueza nacional* (national wealth) as early as the 1850s.<sup>26</sup> In 1862 and 1877, respectively, José María Pérez Hernández and Emiliano Busto published extensive volumes of compiled statistics that sought to represent the entirety of the nation's population, production, natural resources, political and social structure, and more.<sup>27</sup> Hacienda began to publish monthly reports of exports and imports by port and by type of good in the

24. See for example the responses to questions on coffee cultivation from municipalities in Veracruz. "Cuestionario sobre cultivo y producción del café," *Boletín de Agricultura, Minería e Industrias* 2:1 (July 1892): 54–59.

25. Tooze, "Trouble with Numbers," 4–9; Cook, *The Pricing of Progress*, chapt. 7.

26. Marcello Carnagnani, *Estado y mercado: la economía pública del liberalismo mexicano, 1850–1911*, Sección de Obras de Historia (Mexico City: El Colegio de México, 1994), 27.

27. José María Pérez Hernández, *Estadística de la República Mexicana: Territorio, población, antigüedades, monumentos, establecimientos públicos, reino vegetal y agricultura, reino animal, industria fabril y manufacturera, artes mecánicas y liberales, comercio, navegación, gobierno, hacienda y crédito público, ejército, marina, clero, justicia, instrucción pública, colonias militares y civiles* (Guadalajara: Tip. del Gobierno, 1862); Emiliano Busto, *Estadística de la República Mexicana: Estado que guardan la agricultura, industria, minería y comercio. Resumen y análisis de los informes rendidos á la Secretaría de Hacienda por los agricultores, mineros, industriales y comerciantes de la república y los agentes de México en el exterior; en respuesta a las circulares de 1 de agosto de 1877* (Mexico City: Imprenta de Ignacio Cumplido, 1880).

early 1870s, accompanied by summary reports at the end of each fiscal year.<sup>28</sup> Newspapers published projected state and national budgets and reported on government spending. State governments published their own statistical reports and cadastral surveys, quantifying tax incomes and property size as part of larger efforts to privatize and standardize property-holding.<sup>29</sup> The year 1895 marked the first time the Statistical Office undertook a national census, a task it had been charged with in 1883. At the time of the agricultural survey, statisticians were still processing their general summary.<sup>30</sup>

Mexico's 1867 public education law is used by many historians to understand the Mexican elite's ideological orientation and favored policies in the subsequent decades. While statistics it was not one of the key disciplines enshrined in the law for the coming decades, it nonetheless met the needs of a nation intent on order and progress.<sup>31</sup> Citing the work of European political economists and statistical thinkers like Schlozer, Sinclair, and Moreau, as well as pointing back to ancient societies from Egyptian pharaohs to the Inca, Mexico's bureaucrats asserted that statistics provided governments with "the only data that can provide solutions to the gravest administrative problems and provide for the prosperity of the people."<sup>32</sup> Statistics could connect the most mundane needs to the grandest aspirations of a polity.<sup>33</sup>

Thus, by the time the Agricultural Society proposed its survey for the 1900 Paris Exposition, data collection, both qualitative and quantitative, was something people across Mexico were accustomed to, even if their adherence to the statistical norms and terminology used in national projects remained unconsolidated. Despite repeated attempts to standardize the management and exploitation of rural property, the Mexican government had minimal control

28. For example, see Secretaría de Hacienda, *Noticia de la importación y exportación de mercancías 1872-1875* (Mexico City: Tip. Gonzalo A. Esteva, 1880); and Mexico, Secretaría de Hacienda y Crédito Público, *Noticia de la exportación de mercancías 1887-1888* (Mexico City: 1889).

29. For one example, see Chiapas, *Memoria que presenta el Ciudadano Manuel Carrascosa, como Gobernador Constitucional del Estado Libre y Soberano de Chiapas a la H. Legislatura. Correspondiente al primer bienio de su administración* (Tuxtla Gutiérrez, Chiapas: Imprenta del Gobierno del Estado, 1889), Anexo 4, Hacienda y Guerra.

30. *Recopilación de Leyes, decretos y providencias de los poderes legislativo y ejecutivo de la unión: desde que se estableció en la ciudad de México el Supremo Gobierno*, Vol. 41 (Mexico City: Imprenta del Gobierno, 1886), 5; Mexico, *Censo general de la República Mexicana verificado el 28 de octubre de 1900* (Mexico City: Oficina Tip. de la Secretaría de Fomento, 1901).

31. Zea, *El positivismo en México*; Martí, "Introduction," 209-220; Hale, *The Transformation of Liberalism in Late Nineteenth-Century Mexico*, 140-143.

32. "... facilita a los gobiernos los datos necesarios en donde solamente pueden encontrar la solución de las cuestiones administrativas mas graves y la manera de hacer prosperar a los pueblos." Busto, *Estadística de la República Mexicana*, iii.

33. The introduction to volumes based on surveys circulated in 1877, published by Hacienda in 1880, celebrated the possibilities of fiscal statistics in reverential terms. Pointing to the use of statistics by a multitude of other nations, primarily in Europe, the author asserted that fiscal statistics could be the solution to financial crises, administrative disorganization, and the general malaise of the Mexican economy. Busto, "Introducción."

over the vocabulary and the legal reality that governed rural spaces.<sup>34</sup> The countryside remained incommensurable. Nonetheless, years of data-gathering led higher-ups at Fomento to assert their authority over how the countryside should be represented and to predict the easy completion of the grand statistical project whose results would be carried to the Paris Exposition.

In editing the survey proposed by the farmers, agronomists, and businessmen of the Agricultural Society, officials less familiar with rural realities deleted columns related to products that grew wild, scarcity of labor, transportation routes and prices, and consumption markets, asserting that they could derive this information from what they already had at hand.<sup>35</sup> At some point between the approval of the draft table and the printing of 6,000 copies to be sent to state governors, columns related to crops in production and their value were cut from the sheet—to my great present annoyance, and very likely the annoyance of whoever initially attempted to compile the data that was sent back. Despite the regular practice of requesting information on all crops in production and insisting that local officials not skimp on details—and despite the recognized value of eliciting detailed responses to questions about cultivation and markets—the officials who made the final version of the survey crafted a table with minimal space for nuance, explanation, or variety. The material structure of the table itself reflected the outward-facing representational project of one set of Mexican bureaucrats, committed to looking and acting as a state, even as it undermined the aspiration of a different set of data-driven officials to see the totality of Mexican agricultural production.

## THE UNPUBLISHED STATISTICS

The brief description of the agricultural statistics included in the official report on the Paris Exposition put an end to the self-assurance of Agricultural Society proponents and Fomento technocrats. Tucked away in the detailed accounts of their work to collect, transport, and display specimens of the country's handicrafts, agricultural goods, industries, minerals, and artistic and cultural achievements, Fomento officials employed the passive voice to attribute the

34. Numerous historians have written parallel histories of the land laws mandating repartition, privatization, and titling that emanated from state capitals and Mexico City during this era. See for example Robert H. Holden, *Mexico and the Survey of Public Lands: The Management of Modernization, 1876–1911* (DeKalb: Northern Illinois University Press, 1994); Raymond B. Craib, *Cartographic Mexico: A History of State Fixations and Fugitive Landscapes* (Durham: Duke University Press, 2004); and Lurtz, *From the Grounds Up*, chap. 4.

35. Strangely, and in spite of this, officials at Fomento included this information as part of the project in their report to Congress. Mexico, Secretaría de Fomento, *Memoria 1897–1900*, 72.

failure of the agricultural survey to the late arrival of the requested data.<sup>36</sup> The information the compendium was to intended to contain, including a number of the columns edited out of the circulated tables, was enumerated, but the incomplete project, confounded by poor planning and the predictable unruliness of responses, did not merit more than a few passing sentences.

Although they were the target of much of the blame for the project's failure to achieve its objectives, municipal officials throughout the country did in fact take active part in the project. Fomento circulated some 6,000 printed copies of the blank tables, each measuring about 24 inches by 18 inches, to Mexico's 2,792 municipalities in the spring of 1899. If there was an instruction sheet that accompanied the tables into the hands of the nation's governors, I have not found it.<sup>37</sup> The national archives contain surveys returned from 1,373 municipalities, together representing 18 of Mexico's 30 states and territories. The surveys arrived in Mexico City across the summer, fall, and winter of 1899, with the last arriving from Guanajuato and Durango in the spring of 1900, far too late to be processed before the Paris Exposition began.<sup>38</sup> The surveys for Chihuahua, Campeche, Colima, Puebla, Sinaloa, San Luis Potosí, Tabasco, Tlaxcala, Veracruz, and Zacatecas were either never returned or have slipped through archival cracks in the ensuing century.<sup>39</sup> Similarly, I have never found evidence of anyone returning the tables related to cattle and local markets that were supposedly circulated alongside the agricultural surveys.<sup>40</sup>

While no state has a complete set of responses, there are reports from at least two-thirds of the municipalities in every state that did submit forms.<sup>41</sup> It is difficult to discern any patterns in the municipalities and states that did not return forms: a number of mining towns, urban centers, and even Mexico

36. The Agricultural Society was not the only organization that failed to deliver on its promised project for the Paris Exposition. The Mexican Academy of Jurisprudence and Legislation did not complete its project of collecting and publishing Mexico's codes and procedures because of "difficulties not worth explaining." Mexico, Secretaría de Fomento, *Memoria 1897–1900*, 71–72.

37. In looking through the bulletins of both Fomento and the Agricultural Society for the months during which these surveys would have been sent out, I have had no luck in finding any reminders to officials or instructions on how to fill them out.

38. Oaxaca, with 739 of its 1,100 municipalities reporting, represents about half the municipalities in the dataset.

39. I know through examination of catalog records from the state of Michoacán that some have been mixed up. Although records from Michoacán are included in the AGN catalog, multiple requests from me and from a research assistant, and efforts from AGN archivists, have always turned up tables from Hidalgo when the folders identified as containing sheets from Michoacán were requested. *Estadística agrícola de la República*, AGN, Fomento y Obras Públicas: Exposiciones, caja 52, exp. 7.

40. *Iniciativa de la Sociedad Agrícola para formar un cuadro de estadística agrícola*, AGN, Fomento y Obras Públicas: Exposiciones, caja 67, exp. 7.

41. Between the returned tables and the 1900 census, there is considerable variation in spelling and even designation of the district or *partido* or *cantón* to which a municipality belongs. To facilitate mapping and processing, I have applied the 1900 census designations, but the differences suggest that the work of normalizing naming practices discussed by Raymond Craib was still in process at this point. Craib, *Cartographic Mexico*.

City's military quarters (*cuarteles*) did respond, sending in tables indicating they had minimal agricultural properties, but many highly agricultural regions returned no information. Some of the states whose forms are missing were governed by long-term allies of President Díaz, making it hard to assert that any sort of political message was being sent by refraining from returning the tables.<sup>42</sup> I would have a difficult time attributing political meaning to the blank spaces on the map of my dataset, given the known archival fault lines that run through it.

Instead, it is within the returned tables that Jessica Marie Johnson's idea of the null value comes into the play. The variety of ways in which local officials made decisions about providing information (or not providing it)—which column headers to ignore, which to recalibrate, which to accept—provides insight into the continued incommensurability of definitions of agricultural production in turn-of-the-century Mexico.

Municipal presidents or secretaries (or both) took charge of and signed most tables, generally abbreviating their titles and affixing their municipal seal to the finished forms. In Oaxaca, Fidel Sandoval, chief of the Second Section of the Interior Department, signed all the tables himself, after remaking their headers and column labels to better summarize the state's 1,117 municipalities in as little space as possible. A few districts in Chiapas, Coahuila, and Guanajuato returned their forms unsigned, while most officials in Hidalgo, Michoacán, Morelos, the Yucatán, and part of Guanajuato did not include their titles. Differences in handwriting between the information in the tables and the signatures suggest that the signatory did not always fill out the form, but he (always 'he') likely oversaw the process by which data was accumulated. A very few municipal officials indicated that they drew on local tax registers or cadastral surveys as they filled in the form, while a few others wrote that they surveyed property owners directly.<sup>43</sup> Others admitted their responses were estimates or best guesses.<sup>44</sup> With no place for respondents to include

42. I thank the many readers who have asked whether political alliances or enmities between Díaz and state officials might help make sense of the patterns of returns. I have found no correlation, at least on the level of governors, though I leave it to scholars with better knowledge of internal state politics to parse the municipalities that did not return their tables in states that are otherwise represented in the dataset.

43. In San Cristóbal de las Casas, Chiapas, local officials included a note that property values had been drawn from a cadastral survey, and tax information from the state tax law. Similarly, in San Juan del Río (Durango), Autlán (Jalisco), and Coalcomán (Michoacán) officials noted that tax payments or cadastral surveys were used to gather data on value. Officials in Nahuatzen (Michoacán) and Celaya (Guanajuato) wrote that they had talked to property owners as they filled out their forms. *Estadística agrícola de la República*, AGN, Fomento y Obras Públicas: Exposiciones, caja 52, exp. 4 (San Cristóbal); caja 53, exp. 1 (Celaya); caja 53, exp. 3 (San Juan del Río); caja 51, exp. 9 (Autlán); caja 52, exp. 1 (Coalcomán); Caja 52, exp. 5 (Nahuatzen).

44. Officials in Tlalchapa, Guerrero, based their estimates on property titles, noting that the titles did not always contain exact measurements, and those in Paracha, Michoacán simply said that all property sizes were approximations,

information about sourcing, I can only speculate as to whether such documents, even with the trove of prior statistical exercises conducted at the request of national and state governments, provided most of the requested data.

While the data does not provide complete coverage of the Mexican countryside, it is a more extensive, more detailed, and (at least in theory) more commensurate accounting of Mexican agriculture in this period than we have yet had access to. This was the promise made by the Agricultural Society when it proposed the project: by asking everyone the same questions at the same time, the “original and unedited statistics” would overcome the diversity and proliferation of detail that had both encumbered and enriched prior attempts at a statistical portrait of Mexican agriculture. We as scholars, though, must be cautious in our enthusiasm for such a project, in much the way that Fomento officials themselves realized.

In transcribing thousands of pages of surveys, my research assistants and I have come to see that the incommensurability and seeming incompleteness of the project reveal as much as any statistical analysis could offer. The Agricultural Society and the Department of Fomento may have laid the blame on recalcitrant or tardy municipal officials, but comparable statistics on the Mexican countryside remained a relative impossibility so long as the people surveyed continued to understand their livelihoods in diverse and often dissonant ways. By filling out the tables to reflect their own experience of rural productivity, municipal officials and local producers confounded the state’s project of consolidation and authority. But this apparent dissonance does not reflect rebellion or an outright refusal to cooperate; the data returned by local officials, rather than obfuscating or dissembling, demonstrates an ongoing insistence on understanding and depicting local agricultural and economic activity beyond the terms set by the state.

## DEFINING, DELINEATING, AND DEFYING PROPERTY

Property was the organizing principle behind the layout of the agricultural survey. The first column designated the unit for which all other information would be entered. It was labeled “*Nombre de cada hacienda o rancho*” (Name of every hacienda or rancho). This, of course, asserted and assumed a particular kind of property as the unit of production for the Mexican countryside. In an era when desamortization, surveying, titling, and other modes of promoting private

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as did officials in Llera, Tamaulipas. Estadística agrícola de la República, AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 2 (Tlalchapa); caja 52, exp. 5 (Paracho); caja 51, exp. 8 (Llera).

property predominated in public discourse around land use, it is not surprising that a document produced by the central government presumed titled, named properties. It should also be unsurprising, given a growing body of scholarship to this effect, that not everyone in rural Mexico held private title to their land or believed that only privately held land might be seen as productive.<sup>45</sup> The concept of consolidated property regimes was enshrined in the survey's column headings and national cadastral projects alike, but rural producers continued to remind Mexico City technocrats that their project of legibility and standardization was incomplete. Even as they readily provided measures, names, and values, municipal officials undercut Mexico City definitions of productivity and property.

Privatization and registration legislation across the nineteenth century led to a varied rural landscape, as municipal governments, foreign surveying companies, wealthy landowners, and villagers all made their mark on the timeline and manner in which law became reality. There were places where large landholders controlled the process and benefited hugely from the possibilities the law presented for scooping up nearby village lands. Public lands surveyed and sold by concessionaires tended to end up in the hands of *hacendados*. At the same time, land companies had little interest in grappling with the complexities of village holdings and gave them a wide berth.<sup>46</sup> Mandates to divide and sell villages' communal holdings also rarely managed to overturn local understandings of who held what.<sup>47</sup> Privatization laws included clauses providing lands for a minimal fee, or no fee, to those of little means, so even where titling did occur, it did not necessarily mean the displacement of those already working the land.<sup>48</sup> All in all, despite liberals' celebration of private property and its potential for generating economic transformation in Mexico, the landscape remained a motley quilt of property regimes into the twentieth century.

Setting aside the variation in property regimes, municipal officials' reporting on their local landscapes further countered any projection of uniformity from Mexico City. The 1899 agricultural survey provides one of the clearest examples of this

45. This is an enormous literature. For a useful summary of the state of the field, see Antonio Escobar Ohmstede and Matthew Butler, eds., *Mexico in Transition: New Perspectives on Mexican Agrarian History, Nineteenth and Twentieth Centuries / México y sus transiciones: reconsideraciones sobre la historia agraria mexicana, siglos XIX y XX* (Mexico City: CIESAS, 2013); and Antonio Escobar Ohmstede, Zulema Trejo Contreras, and José Alfredo Rangel Silva, *El mundo rural mexicano en la transición del siglo XIX al siglo XX* (Mexico City: CIESAS, LMI/MESO, IRD, El Colegio de San Luis, 2017).

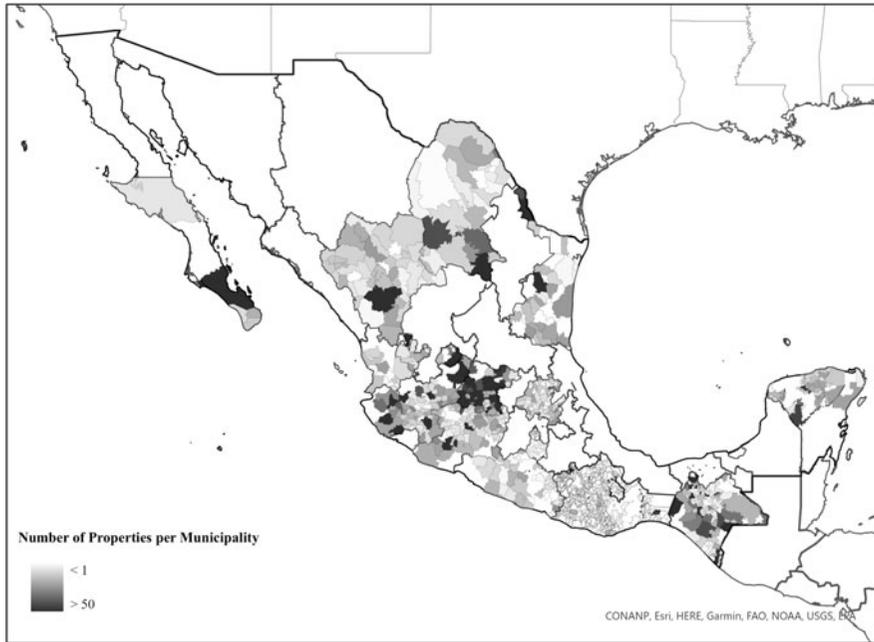
46. Holden, *Mexico and the Survey of Public Lands*; Justus Fenner, *La llegada al Sur: la controvertida historia de los deslindes de terrenos baldíos en Chiapas, México, en su contexto internacional y nacional, 1881–1917* (San Cristóbal de las Casas: CIMSUR, 2015).

47. Kourí, *A Pueblo Divided*.

48. Lurtz, *From the Grounds Up*, chapt. 4; State of Chiapas and Antonio A. Moguel, *Nueva colección de leyes de hacienda vigentes en el estado de Chiapas* (Tuxtla Gutiérrez: Impr. del Gobierno del Estado, dirigida por F. Santaella, 1899), 109.

FIGURE 3

Number of Properties Reported by Municipality. Prepared by author, 2023.  
Interactive version of this map available at <https://caseylurtz.com/agricultural-statistics>.



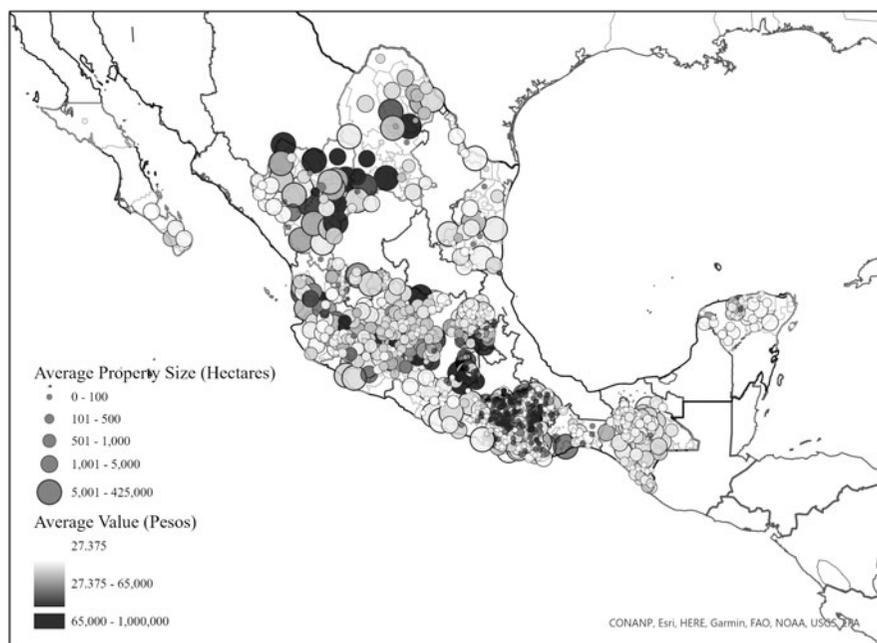
persistent refusal to accommodate national standardization. The table in [Figure 3](#) shows the number of properties reported by municipality, but no municipal official included all properties in his table, and officials differed in how they determined what they should report on.<sup>49</sup> The “*haciendas y ranchos*” part of the table header lacked official definition, and while states in the center of the country—Aguascalientes, Michoacán, Morelos, Hidalgo, Tepic (now Nayarit)—tended to add the property type in parentheses or include it as part of the property name, such labeling was uncommon elsewhere.<sup>50</sup> Most officials did

49. Chiapas and Durango, according to the 1900 census, had roughly similar populations of around 370,000 inhabitants. Yet the forms submitted from Chiapas included more than 2,300 properties, while Durango reported on only 572. As Justus Fenner reminded me at the Reunión de Historiadores de México in 2018, historians working to count properties in Chiapas for the late nineteenth century have found more than 10,000 in that state alone, so even Chiapas was far from reporting on every landholding in the state.

50. The terms ‘*hacienda*’ and ‘*ranchos*’ were both in widespread use by the government and by locals. The terms were used in censuses and tax law, yet nonetheless lacked formal definitions. As Escobar Ohmstede and Butler outline, based on recent historiography, haciendas remained relatively stable in number from 1880 (5,869) through the early twentieth century (5,932). Ranchos, on the other hand, increased exponentially, from 14,705 in 1880 to 32,557 by 1900. Their numbers do not line up with the numbers from my dataset, unsurprisingly given its incompleteness and the inconsistent inclusion of the terms by municipal officials. My dataset includes 1,610 haciendas, 3,470 ranchos, 322

FIGURE 4

Average Property Size and Value, Summarized at by Municipality. Prepared by author, 2023. Interactive version of this map available at <https://caseylurtz.com/agricultural-statistics>.



take seriously the request for property name, with almost all rows containing a saint's name (there were 158 San Antonios and 99 San Josés), an aspirational name (37 La Providencias, 44 El Refugios, and 24 La Esperanzas), or a descriptor (26 Buena Vistas, 22 Rancho Nuevos).

An analysis of the full dataset demonstrates that each official had a relatively consistent practice of selecting properties for inclusion on the basis of value and size. About half included only properties over a certain size and value—with an extension of at least 100 hectares, and a value of at least 500 pesos being a fair generalization—while the other half threw such definitions to the wind and included a wide variety of properties they saw as agriculturally productive (see Figure 4). In its totality, the dataset

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properties labeled as town lands or pasturage, and 269 municipalities with no properties listed. An additional 9,230 properties—the vast majority—lack any annotation of their type. Antonio Escobar Ohmstede and Matthew Butler, "Introduction: Transitions and Closures in Nineteenth- and Twentieth-Century Mexican Agrarian History," in *Mexico in Transition: New Perspectives on Mexican Agrarian History, Nineteenth and Twentieth Centuries*, 52–53.

makes clear that officials in the center and south of Mexico were more inclined to include smaller properties of lesser value, while northern officials tended to note only large ranches and *latifundia*. Everyone, though, included a wider variety of property types than the historiography might lead us to expect.

The 250 or so municipalities that returned blank or sparsely annotated tables provide additional insight into how officials made their decisions about what properties to include. One respondent, Franco Urbino, the municipal president of Chanal, Chiapas, explained his blank form by writing that “there are neither ranchos nor haciendas as all the indígenas work in the town’s *ejido*.”<sup>51</sup> Urbino judged that the *ejido*, one of the communally held and managed lands the national government had been trying to privatize for half a century, was not the kind of productive landscape Fomento cared about. A few officials reported that mining was their only economic activity, while elsewhere authorities wrote that the land was divided into such small parcels that none could even be labeled ranchos, “*por estar tan fraccionado*.”<sup>52</sup> The vast majority of such annotations, though, came from Oaxaca. There, Fidel Sandoval from the Interior Department faced down the state’s more than 1,000 *municipalities* by remaking the government-issued document to fit the rural reality as he comprehended it. He created a single table for each district, inserted a new column for recording the name of the municipality, and made liberal use of the phrase “*No hay Haciendas ni Ranchos en estos pueblos según se desprende de las noticias respectivas*” (There are no haciendas or ranchos in these towns, according to the respective information). Or, more simply, he sometimes wrote “*No hay*” (there are none). The 243 municipalities Sandoval listed at the bottom of each district sheet constitute the bulk of all places that reported no information.<sup>53</sup>

Sandoval’s reasons for failing to report haciendas and ranchos were contradicted in other parts of Mexico. In 81 municipalities distributed more or less equally across the country, officials (unlike Francisco Urbino in Chiapas) included all or parts of the village *ejido* alongside the named properties. Some 46 officials listed the *ejidos* as a single unit, as in “the *ejidos* of [town name],” or simply wrote the name of the town itself, while the rest included multiple individual entries labeled as “*fracción*” or reported with a unique name. Elsewhere, a process of privatization was implied by the phrase “*pequeñas propiedades*” (small

51. Estadística agrícola de la República, Chanal, Chiapas, June 17, 1899. AGN, Fomento y Obras Públicas: Exposiciones. caja 52, exp. 4.

52. Estadística agrícola de la República, Titotepec, Cab. San Bartolo, Hidalgo, August 3, 1899. AGN, Fomento y Obras Públicas: Exposiciones. caja 51, exp. 15.

53. Estadística agrícola de la República,” state of Oaxaca, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 4.

properties) to cover a number of unnamed lots, which were grouped together in a single row of the table.<sup>54</sup> Even Sandoval, he of the 243 property-less municipalities, included lots as small as 0.35 hectares in his reports.<sup>55</sup> All such parcels were understood to be key parts of the agricultural life of villages throughout Mexico, despite the long history of campaigns to eliminate communal ownership.

While officials from north to south included ejidos in their reports, those in the center and south of the country were more likely to provide information on properties under 100 hectares. That is the figure I use in my designation of a small property, based on norms in the dataset. This division corresponds to established demographic and cultivation patterns: the arid north had a later history of settlement and a greater focus on large-scale ranching and commercial grain and fiber cultivation, while the center and south of the country had settled agricultural towns with longer histories. At least 40 percent of the properties reported in Chiapas, Guanajuato, Guerrero, Hidalgo, Mexico City, and Oaxaca contained less than 100 hectares. That said, Aguascalientes reported details on no properties under 100 hectares, and in Tepic (Nayarit) and Morelos, only 8 percent and 15 percent, respectively, of properties listed were so small. All the northern states reported less than 40 percent of their properties as smaller than 100 hectares, though Tamaulipas included 133 such lots (31 percent of its total). The inclusion of so many small properties, particularly in the center and south, but also some in the north, reminds us of the persistence of subsistence and smallholding even as larger haciendas began to encroach on village lands.

A few brief notes on property size and value are merited here. My decision to demarcate the differences between small and large properties at 100 hectares and 500 pesos is based on both the norms revealed by the dataset I have used and the legal practices of the era, which required public registration of transactions valued over 500 pesos.<sup>56</sup> The overlap between the two markers is not uniform, but in general, municipal officials either did or did not include properties under that size and value. While the average property size for the 14,900 properties in the dataset was 1,642 hectares, the mean was only 143

54. The towns of Rincón de Ramos and Aguascalientes, both in Aguascalientes, listed “*pequeñas propiedades*” on one line of their tables. Estadística agrícola de la República, AGN, Fomento y Obras Públicas: Exposiciones, caja 52, exp. 10.

55. Estadística agrícola de la República, Asunción Nochixtlán, Oaxaca, December 15, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 4.

56. Mexico, *Código civil del Distrito Federal y Territorio de la Baja-California* (Mexico City: Imprenta dirigida por José Batiza, 1870), Art. 1439; Casey Marina Lurtz, “Codifying Credit: Everyday Contracting and the Spread of the Civil Code in Nineteenth-Century Mexico,” *Law and History Review* 39:1 (February 2021): 117, <https://doi.org/10.1017/S0738248020000358>.

hectares. Many other scholars use 1,000 hectares or something close to it as the cutoff point for large properties, while Jean Meyer reports the size of an average agricultural holding in Mexico in this era at 5,600 hectares.<sup>57</sup> These figures obscure the variety of agricultural holdings, and the prevalence of that variety, that made up the landscape of rural productivity in turn-of-the-century Mexico, especially as that landscape was understood by those in the countryside rather than those in Mexico City. Other scholars' high average property size figure feeds on and feeds into the narrative success of privatization projects as projected by Porfirian technocrats and also by Revolutionary-era reformers, who represented themselves as toppling the greedy land-grabbing oligarchy. In 1899, only about half the municipal officials who took part in this project of visualizing the countryside's productivity considered that agriculture happened only on properties over 100 hectares in size and greater than 500 pesos in value.

Municipal officials also had no problem in representing how much of the land remained uncultivated. The table circulated by Fomento nowhere asked for total property size. Instead, it asked for five different measures in hectares: extension exploited, extension not exploited, extension of irrigated lands, extension of rain-fed lands, and hilly or woodland surface area (*superficie montuosa*).<sup>58</sup> My comparisons of property size are based on the sum of exploited and unexploited land, but it is worth noting that this sum was not always equal to those otherwise calculated.<sup>59</sup> In total, the surveys account for more than 40 million hectares of land spread across the countryside (out of a total national surface area of almost 200 million hectares, or 1.9 million square kilometers). Some 24.5 million of those hectares, or about 60 percent of the total in the surveys were reported as unexploited. And while Mexico's Secretary of Fomento insisted that only irrigated land could be counted as agriculture, only a little over one million hectares (less than 1 percent of the country's total territory) were reported as irrigated, with another 17.25 million listed as

57. Jean-André Meyer, *Problemas campesinos y revueltas agrarias: 1821–1910* (Mexico City: Secretaría de Educación Pública, 1973), 229; Alejandro Tortolero Villaseñor, *De la coa a la máquina de vapor: actividad agrícola e innovación tecnológica en las haciendas mexicanas, 1880–1914* (Mexico City: Siglo XXI Editores, 1995), 194.

58. *Montuosa* literally translates as hilly, but partially wooded lands were also called *montes*.

59. My assumption was that irrigated and rain-fed lands together ought to equal exploited hectares, and that the number given for unexploited hectares ought to be equal to or smaller than woodland surface area. This assumption does not always stand. In many municipalities, the sum of irrigated and rain-fed land exceeds the sum of exploited and unexploited land, or woodland surface area exceeds any combination of the other columns. Sometimes the unexploited and rain-fed columns contain the same number, as do the exploited and irrigated columns. Sometimes exploited and rain-fed are equal. I have yet to find a pattern in how different municipal officials made these calculations and equivalencies, but I recognize the imprecision of my total hectares column and have decided that it is nonetheless the best I can do.

rain-fed.<sup>60</sup> Another 21.5 million hectares (about 11 percent of the total territory) were reported as wooded.<sup>61</sup>

Clearly, the technocrats at Fomento and the Agricultural Society recognized that much land remained unplanted, given their inclusion of these columns in the table. Cartographic representations of Mexico's agriculture from 1885 similarly included "uncultivated land" as a category.<sup>62</sup> To count these lands as unproductive, though, misses the point. Germán Vergara's 2021 summary of nineteenth-century energy regimes explicates how such lands contributed fuel for heating, cooking, and steam power. They provided building materials, afforded foraging that yielded goods for sale and personal use, and supported broader ecologies.<sup>63</sup> Forests were also seen as necessary for the maintenance of rainfall, a theory environmental historians refer to as desiccationism, and early conservation movements in Mexico resulted from a consensus across social strata that forestland must be preserved. This, perhaps, is why land that could be described as "*montuoso*" was counted apart, and why its associated calculations do not always square with those of the other columns: woodlands were still recognized as largely a public good, even as privatization laws chipped away at their legal status as communal holdings.<sup>64</sup>

By reporting numerous small properties and also regularly documenting large expanses of forested and uncultivated lands, many municipal officials asserted a diversity of productive landscapes against the homogeneity of the haciendas and ranchos implicit in the wording of the column header. They rewrote the table to capture their realities, countering the technocrats' admiration for plantation systems, as they carved out space to work against homogenizing

60. Mexican water law in the nineteenth century has come in for a great deal of study in recent years, with irrigation as a growing field of study. An 1888 law concerning the use of water extended the reach of the federal government into many ongoing disputes over water use, often between hacendados interested in diverting water for irrigation or energy generation and villages reliant on the same waterways for the natural watering of their lands. The droughts of 1906 and 1907 would bring an additional push from Fomento to promote irrigation. This took shape via the 1908 foundation of a national credit bank for irrigation and agriculture, the Caja de Préstamos para Obras de Irrigación y Fomento de la Agricultura, that was intended to support both large- and small-scale agriculture but in fact funded only major enterprises. See Tortolero Villaseñor, *De la coa a la máquina de vapor*, chaps. 2 and 3, for an overview. See also Abdiel Oñate, *Banqueros y hacendados: la quimera de la modernización* (Mexico City: Universidad Autónoma Metropolitana, Unidad Xochimilco, 1991), 35; and Paolo Riguzzi, "Sistema financiero, banca privada y crédito agrícola en México, 1897–1913: ¿Un desencuentro anunciado?," *Mexican Studies/Estudios Mexicanos* 21:2 (August 1, 2005): 361–362. For the quote on "capricious rains," see Mexico, Secretaría de Fomento, *Memoria 1897–1900*, 124.

61. Pérez Hernández, *Estadística de la República Mejicana*, 58–59; Germán Vergara, *Fueling Mexico: Energy and Environment, 1850–1950* (Cambridge: Cambridge University Press, 2021), 37.

62. Antonio García Cubas, "Carta agrícola," in *Atlas pintoresco e histórico de los Estados Unidos Mexicanos* (Mexico City: Debray Sucesores, 1885).

63. Vergara's discussion of the amount of forested land necessary to fuel various kinds of industries—ironworks, railroads, and others—is a particularly useful reminder of the necessity of uncultivated land. Vergara, "1850s: Solar Society;" chapt 1. in *Fueling Mexico*.

64. Christopher R. Boyer, *Political Landscapes: Forests, Conservation, and Community in Mexico* (Durham; London: Duke University Press, 2015).

attempts at legibility. However, about half the officials who submitted tables did adhere to the official rhetoric of rural productivity based on large-scale agriculture. What Mexican officials wanted to advertise abroad had also taken hold at home: for some, agriculture meant irrigation, extensive cultivation, and the consolidation of sizeable holdings. The remaining municipal officials pushed back and included everything from communally held ejidos and half-hectare private plots to the expansive ranches and plantations Fomento officials imagined. To them, it did not make sense to exclude small-scale agriculture on either privatized or communal lands from an accounting of what made the countryside productive. Smallholders paid taxes and produced foodstuffs, usually for regional consumption, which made their land and their use of it meaningful to many local officials. The promotional aims of Fomento officials notwithstanding, the Mexican countryside remained a patchwork of modes of production.

## SEEDS EMPLOYED

In the table, the fourth column from the left is titled in a small font displayed vertically: “*Rendimiento por extensión ó semilla empleada*” (yield by extension or seed employed). Like the rest of the headings, it implies a shared understanding of agricultural productivity. Data in this column, though, is the least comprehensible of the entire dataset. No matter how much my research assistants, students, and I tinker with numbers, spellings, and conversions for units of measure, the data in the yield column will never spread nicely across a table or provide pretty infographics.<sup>65</sup> Indeed, its confusing contents hammer home hardest of all the dissonance between the uniformity desired by the científicos and variation insisted on by rural producers. Placed in the context of decades of data collection, the yield column provides a window into how assumptions of consolidated capacity and their accompanying rhetoric undermined a shared attempt at information gathering.

The column as conceived imagined an orderly march of monocrop properties with consistent outputs that could be predicted in advance. The space provided allowed only a single rate of yield—and no indication that those providing information ought to note what was being grown. In the exchanges between the Department of Fomento and the Agricultural Society over 1898, as they hammered out the survey form, we can see the gradual elimination of columns

65. Thanks to the students in the Spring 2021 Johns Hopkins History Lab: Making Maps of Mexico for working so hard to figure out a way to standardize the units of measure in this column and eventually realizing it was much more interesting to talk about why we could not do so.

asking for the names of crops. The elimination was based on the assumed capacity of Fomento officials to derive this information by cross-referencing the 1899 survey data with the piles of data the Office of Statistics already had on hand.<sup>66</sup> Municipal officials filling out the surveys likely made such assumptions too, knowing that Mexico City officials must have additional information at their disposal and thus providing only the single data point the survey columns and rows suggested. Reports for about two-thirds of the properties included show only a single rate per unit and, perhaps, a metric, generally hectoliters or kilograms or seed employed. The metric might read something like 100 x 1, 50 for 1, or 20/1, with no indication of the crop to which this rate referred. Once again, the historian, separated by more than a century, finds herself sharing the contemporary bureaucrats' dilemma: what to do with numbers without content? Yet, she also finds herself sympathetic to the producers and municipal officials. Why provide more information than was asked for, especially given the piles of surveys detailing crops they had previously completed?

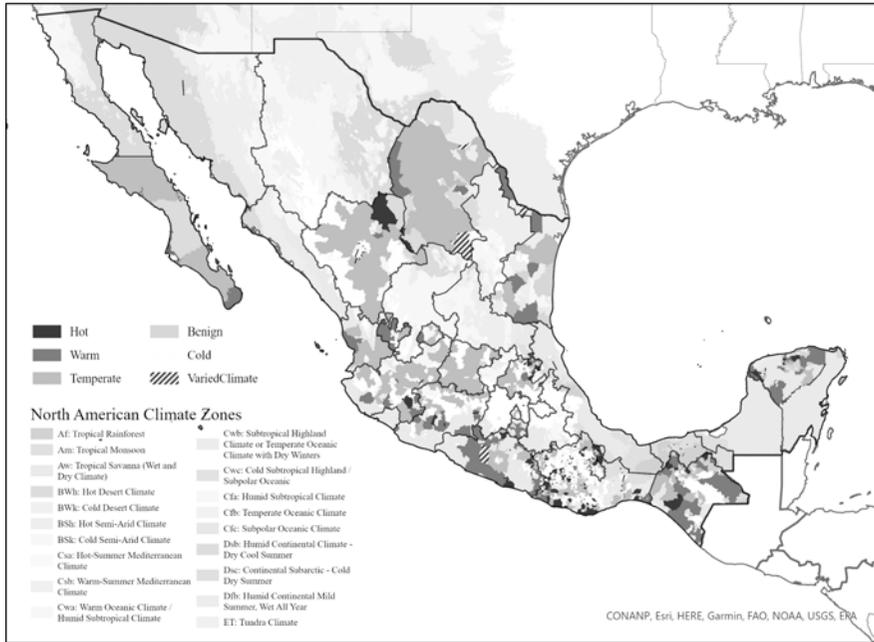
A look at weather, though it is not a descriptor of property, does provide contrast and a reminder about context. Municipal officials used more than 30 different descriptors to complete the column titled *clima* (climate). In contrast to other columns, it is relatively straightforward to consolidate these descriptors into eight categories: cold (2,268 properties), temperate (7,508 properties), benign or healthy (452 properties), warm (2,631 properties), hot (1,130 properties), and varied (273 properties), plus categories for the 52 properties whose climate was represented with numerical data on temperature and the additional 65 that gave a weather descriptor outside these eight categories. Half the municipalities included only a single descriptor for their whole territory, often scrawled vertically across the whole column. In fact, some municipalities were spread across quite varied terrain, but this was a column that nonetheless invited and achieved an apparent consistency (see [Figure 5](#)).

Map this data onto a contemporary depiction of Mexico's climate zones, though, and the localized referentiality of municipal officials' terms comes into sharp relief. "Temperate" is the most common descriptor in the dataset by far, comprising more than half the properties reported. According to modern climate modeling, Mexico includes at least 13 different climate classifications on the

66. I would love to know who decided to axe the column header requesting the name of the crop in production and why they did so. The correspondence regarding the table does not even mention the changes made to the final version of the table, leaving us to wonder whether the typesetter might have just run out of space. The Agricultural Society did not have final approval of the circulated table, so it is entirely possible that the technocrat assigned to the project, unfamiliar with agrarian life but committed to a successful World's Fair exhibition, did not even notice the omission. *Iniciativa de la Sociedad Agrícola para formar un cuadro de estadística agrícola, 1898*, AGN, Fomento y Obras Públicas: Exposiciones, caja 67, exp. 7.

FIGURE 5

Most prevalent standardized climate descriptor by municipality, mapped over North American Climate Zones. Prepared by author, 2023. Interactive map available <https://caseylurtz.com/agricultural-statistics>.



basis of temperature, precipitation, and seasonality.<sup>67</sup> An analysis of the use of the term “temperate” in the 1899 dataset reveals it to be spread across most of those zones. It is hard to believe that the person who described their home in Mexico’s central plateau as temperate would use the same term to describe the weather in Chihuahua’s northern deserts. Even within regions, officials clearly had different definitions of these terms. The Yucatán Peninsula, for example, aside from its northern coast, sits within a single modern climate zone—tropical savannah. Yet municipal officials there used a great variety of terms— *bueno*, *benigno*, *regular*, *cálido*, *sano*, *templado*, *mal sano*, *frío*, *torrido*, *fresco* (good, benign, regular, hot, healthy, temperate, unhealthy, cold, torrid, fresh)—to describe

67. Commission for Environmental Cooperation (CEC), 2021, “Climate Zones of North America,” Hylke E. Beck, Niklaus E. Zimmermann, Tim R. McVicar, Noemi Vergopolan, Alexis Berg, and Eric F. Wood (2018): Present and future Köppen-Geiger climate classification maps at 1-km resolution. *Scientific Data* 5:180214. Ed. 1.0, Vector digital data [1:10,000,000]. [https://services7.arcgis.com/of9CDB4UYF7Um9q/arcgis/rest/services/North\\_America\\_Climate\\_Zones/FeatureServer](https://services7.arcgis.com/of9CDB4UYF7Um9q/arcgis/rest/services/North_America_Climate_Zones/FeatureServer), accessed January 21, 2022.

their home places.<sup>68</sup> Even where the dataset seems to offer easy comparisons, it is an invitation undercut by reminders of referentiality and local variation.

Along with the municipal, state, and national cadastral surveys that were conducted for decades before 1899, the central government had also been collecting data on climate and crops. The referentiality with regard to weather that ArcGIS makes apparent to us today would also have been apparent to científicos at both Fomento and the Agricultural Society, after years of badgering local officials to report accurately on any crop in production, however miniscule the yield.<sup>69</sup> Provincial officials and producers persisted in submitting such information as their names for different kinds of rain and the frequency of double rainbows, even as technocrats urged them to adopt emerging global norms for describing temperature, precipitation, barometric pressure, and so on.<sup>70</sup> Similarly, local officials undermined assumptions of export-oriented cultivation by responding to questionnaires about crops in production with narratives of local consumption and intermixed subsistence and commodity crops.<sup>71</sup> Unable to subsume the responses into the normalized tables and figures it would like to have had, the Department of Fomento reprinted the transcript of local responses in full in its monthly bulletin.

Given that they had long accommodated the narrative and nuanced accounting of agricultural cultivation and weather, Fomento officials and Agricultural Society members alike should have known that providing a single space for yield information would result in a confusion of responses. And yet, the 1899 table included only a small, squished space for yield, barely enough for a single entry. Even before the editorial process took a hatchet to numerous columns, the draft version crafted by the Agricultural Society's farmers and agronomists left little space for reporting on multiple crops, despite their prevalence in rural life. Noting the limited space and assuming that the central government would apply the results of their previous survey responses, most municipal officials listed only one number or rate in the yield column. Even if I were to attempt to do the matching work that Fomento and the Agricultural Society never got to, the singular yield rate would prove hard to match to any one of the many crops

68. Estadística agrícola de la República, Yucatán. AGN, Fomento y Obras Públicas: Exposiciones, caja 51, exp. 14.

69. Expediente sobre producciones agrícolas, January 28, 1898, Archivo Histórico de Monterrey, Fondo Monterrey Contemporáneo, Serie Disposiciones Generales, Colección Civil, Sección Ayuntamiento, Vol. 415, exp. 9.

70. "Meteorología: Toluca," *Boletín de Agricultura, Minería e Industrias* 7:9 (March 1898), 147; for comparative examples from colonial Africa, see Philipp Lehmann, "Average Rainfall and the Play of Colors: Colonial Experience and Global Climate Data," *Studies in History and Philosophy of Science* [Special Issue: Experiencing the Global Environment] 70 (2018): 38–49.

71. See for example an 1892 questionnaire on coffee production and the responses from Veracruz that initially denied that coffee was produced and then nonetheless elaborated on municipal ejidos' mixed agricultural production and the local consumption of coffee grown there. "Cuestionario sobre cultivo y producción del café," *Boletín de Agricultura, Minería e Industrias* 2:1 (July 1892), 54–59.

each municipality reported elsewhere. The divergence in unspecified yields within many municipalities means that we cannot even assume that municipal officials were always reporting on the same crop within their jurisdiction. In a typical case, the municipal secretary in Nombre de Dios, Durango reported yield as “[number] por 1,” with those numbers ranging from 30 to 100.<sup>72</sup>

Turning to the almost 4,000 properties for which municipal officials wrote notes outside the table lines, there is no doubt as to the persistence of mixed cultivation of subsistence and commercial crops. Using multiple rows to describe yield for a single property, writing in letters as small as possible at odd angles to the sheet, or describing production for an entire municipality in a note below the table, municipal officials throughout the country reminded Mexico City technocrats of previous surveys answered.

Corn, always Mexico’s staple good, was the most frequently named crop, whether listed alone or alongside other goods. Two-thirds of properties that only listed one crop listed corn, a crop that Fomento and the Agricultural Society had done little to study or promote to this point and whose inclusion was likely of little interest to World’s Fair goers.<sup>73</sup> Beans and wheat came next in popularity, followed by sugar, cacao, rice, and coffee. Of these, only cacao and coffee fall under our traditional understanding of export goods, though if we look to Mexico’s export-import reports, we see that sugar, rice, and beans were also regularly sent abroad from the country’s ports.<sup>74</sup> Municipal officials resisted the national emphasis on export commodities and other tax-generating goods to continue reporting on corn and beans, even if other vegetables tended to get short shrift.<sup>75</sup> It is tempting to speculate that the singular yield rate listed everywhere else corresponded to one of these crops, most likely corn, but again, the rates recorded are so varied, even within municipalities, that such a supposition would push the bounds of probability.

With some additional cleaning and standardization of metrics, we could generate comparisons of yield rates for those places that did specify both a crop and a rate, map them onto climate zones or proximity of transportation or market towns, or

72. Estadística agrícola de la República: Nombre de Dios, Durango, August 14, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 3.

73. The remaining 370 properties listing a single good are quite mixed as to the type of good. A cluster of properties in Chiapas noted only coffee and cacao—export goods—but the rest listed products as varied as sugar, fibers, rice, pasturage, and even beans as the only good under cultivation.

74. See annual reports such as Mexico, Secretaría de Hacienda y Crédito Público, *Noticia de la exportación de mercancías (1875–1889)* (Mexico City: Imprenta del Gobierno, 1872).

75. Only one property, La Mota in Coahuila, listed *legumbres* in this column. Potatoes, chiles, favas, and yams were the only other vegetables specified, aside from beans and garbanzos. Producers had at least five different terms for sugar production, depending in part on the grade of the final sugar product. Estadística agrícola de la República, C. Porfirio Díaz, Coahuila, June 30, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 51, exp. 13.

compare them with current-day production, or standard of living, or industrialization factors. To what end, though? The surveys were intended as advertisements of Mexico's current productivity and its potential. The diversity of crops noted by this subset of municipal officials does point to the country's embrace of a varied market basket. Further statistical or cartographic analysis could show which parts of the country presented themselves as most fruitful, most full of possibility. Chiapas, where many officials carefully noted yields for different export crops, was a hub for foreign and national investment in tropical agriculture in the late nineteenth century. It is not surprising that its officials touted the cacao, coffee, and sugar they produced. In contrast, Oaxaca and Yucatán also saw significant investment in agricultural modernization during this era and yet neither reported much in the way of yield data. As with so much of this dataset, further attempts at quantification are misleading at best.

Instead, the yield data reminds us of the shared and ongoing project of promotion and knowledge-gathering and the ways it was undermined in the course of its adoption and implementation. Municipal officials and Mexico City científicos alike assumed a degree of statistical and administrative capacity on the part of the central state. They assumed, for the most part, a shared language of crops and metrics based on decades of corresponding about agricultural productivity. These assumptions mean that the yield data provided by survey participants was and is unusable in the aggregate. It can provide insight for scholars working on a local scale who are interested in particular municipalities, so long as they already have a sense of what was growing and how to integrate the reported rates with regional market information. Yet overall, the yield column highlights the ways in which the state was blinded to the everyday norms of subsistence production by its own emphasis on exports.

## THE MEANS OF CULTIVATION

What counts as a tool? A machine? An apparatus? Whose work is considered productive? The right-hand half of the table requested information on the means of production, both human and mechanical. Reporting on labor resulted in relatively consistent norms that nonetheless trouble our assumptions about wages across Mexico, while the columns on tools and machinery show both the penetration of technocratic understandings of what counted as agricultural modernization and rural people's continued reliance on much older aids in cultivation. Municipal officials in their majority pushed back on the insistence on new technologies, but by regularly making the distinction between old and modern, Mexican and imported, they made clear their engagement with ideas

of agricultural progress. By reporting local labor norms almost exclusively in terms of daily wages, they demonstrated an embrace of liberal imaginings of free wage labor, though questions of gender, age, and the occasional slippage around that daily wage illuminate the cracks in the facade.

As with yield and climate, it makes sense to look at tools, machinery, and labor together in order to see the ways that both apparent standardization and incommensurability point to provincial reworkings and frustrations of the assumptions made by state projects. Technocrats were more specific in their requests for information in these columns than in those columns that came before. The categories “*máquinas*,” “*aparatos e instrumentos*,” and “*promedio de los jornales diarios que se pagan cada hacienda o rancho*” (“machines,” “tools and instruments,” “average of the daily wage paid on each hacienda or rancho”) were further divided. For “machines,” the information requested was number, manufacturer, and horsepower; for “tools and instruments,” it was number, name, and value; and for “wages,” the breakdown was for men, women, boys, and girls. Here was the specificity and definition of terms lacking in other parts of the survey. Only machines with a manufacturer mattered. Only tools with value needed to be reported. Only daily wage labor counted. Again though, municipal officials’ responses undermined the imagined consistency of these terms by chipping away at their implied norms.

The Department of Fomento and the Agricultural Society dedicated considerable resources to promoting the adoption of agricultural technologies by Mexican farmers. As with irrigation, mechanization and the use of sophisticated tools stood in for the advancement of rural productivity and the embrace of modern agriculture. As Alejandro Tortolero Villaseñor’s careful study of innovation and agriculture in late nineteenth century Mexico makes clear, elites both in and beyond government pushed the country to move “*de la coa a la máquina del vapor*”—from the traditional digging stick to the steam-powered machine.<sup>76</sup> This push was directed at both smallholders and well-capitalized enterprises, though of course it was most often the latter who had the means to acquire and put into use tractors, threshers, sorters, and mills. Edward Beatty’s work on the history of technological importation and uptake further clarifies this by demonstrating how, while invention was part of the story and patents for new kinds of tools were encouraged, the definition of progress in agriculture and in industry tended to rely on adoption rather than innovation. Yet, even where education in new technologies was encouraged and facilitated by Fomento

76. Tortolero Villaseñor, *De la coa a la máquina de vapor*.

and other government entities, human capital of the sort represented by technological know-how remained scarce.<sup>77</sup>

The impulse for adoption and importation is quite clear in the dataset. So is the continued use of traditional implements. Though space in the columns was tight, municipal officials listed a multitude of tools employed, spilling their words into neighboring columns or referring readers to notes they added below the table when they ran out of space, or when the notes were providing information applied to their municipality as a whole. Beyond the generalizations of “*varios*” (various), coas, hatchets, and machetes were the most common implements listed, and more than half of all properties that enumerated their machinery included some sort of plow among their inventories.

Here the embrace of modernizing agriculture as represented by manufactured implements becomes apparent. Adjectives were common in these columns. They indicated whether tools were new or old, imported, or outmoded. Some plows were wooden, some were iron. Some plows were US-made, some were Mexican-made or “*del país*,” or common. Some were just old. Value was generally indicated per tool by kind, and here it was clear that the old-fashioned Mexican implements were valued less than the new US-made ones.

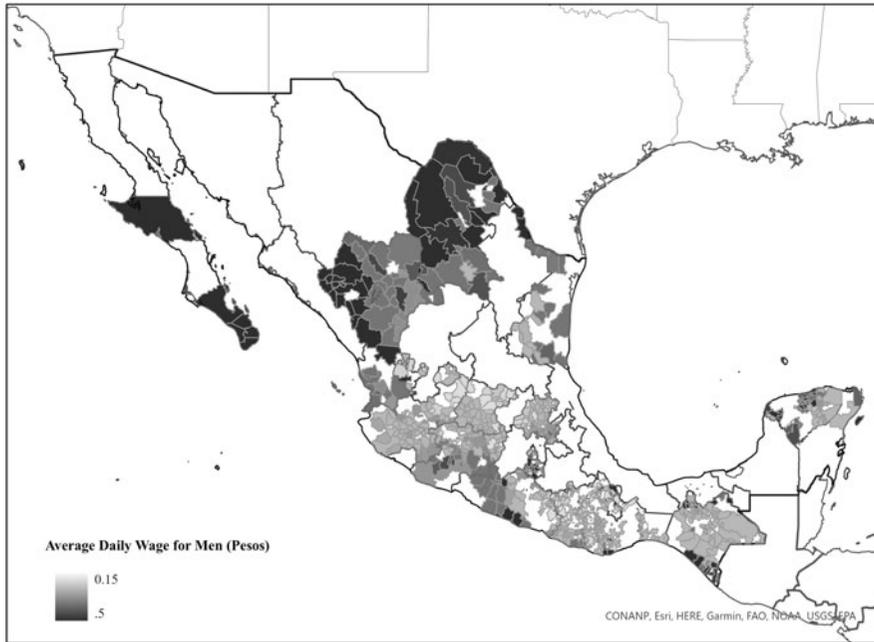
While US-made plows were strongly concentrated in the northern states of Tamaulipas and Coahuila, imported machinery was in use on varied crops throughout the country, from the coffee of Chiapas to the grains and beans of Guanajuato and the sugar of Jalisco. While correct spelling often eluded them (“Marshall,” of the British Marshall agricultural manufacturing enterprise, was spelled alternately as Marsai, Marsal, Marxal, Marzal, Marschall, and otherwise), officials took care in noting in as much detail as possible the make and model of the threshers, mills (*molinos*), sugar mills (*trapiches*), and shellers (*desgranadoras*) employed by larger properties or by the town as a whole. In the latter case, annotations made clear that not each property had a given machine, but rather that all had access to it, without clear indication of ownership.<sup>78</sup> When it came to reporting *fuerza motriz*, or horsepower, responses highlighted how the survey’s goals of uniformity again frustrated local understandings of agricultural progress and productivity. Many machines were still powered by actual horses or mules, rather than coal or steam, and

77. Edward Beatty, “Introduction,” *Technology and the Search for Progress in Modern Mexico*, (Oakland: University of California Press, 2015).

78. For example, the sugar producers of La Barca, Jalisco, listed their machinery for the whole municipality, indicating that most properties shared access to the English steam-powered threshers and US-made centrifugal pump, while the principal haciendas had their own exclusive use of carts and plows made by the Oliver Corporation, one of the most represented in the dataset. Estadística agrícola de la República, La Barca, Jalisco, June 20, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 5.

FIGURE 6

Average Daily Wage for Men (in Pesos), Summarized by Municipality. Prepared by author, 2023. Interactive map available <https://caseylurtz.com/agricultural-statistics>.



water, *a mano* or *de mano* (by hand), and even *sangre* (blood) came into play.<sup>79</sup> Some simply listed a rate of force, but in providing the kind of detail that mattered to them in the actual employ of tools and machinery, municipal officials kept this column from yielding standardized data, despite the carefully chosen column headers.

The request for daily wage by age and gender resulted in some of the most consistent and coherent data reported in the tables, a seeming conformity to the kinds of labor imagined and legislated from Mexico City (see Figure 6). Almost all officials included a daily pay rate in the column for men, often generalized for entire municipalities via repetition, ditto marks, or an

79. For example, San Miguel Tlanichico in Oaxaca had two machines, one made by Veleran Pease and the other by a company in Racine, Wisconsin, both of which included “*de sangre*” in the *fuerza motriz* column. Multiple properties in Tarimoro, Guanajuato, possessed imported machines moved “*de mano*,” or by hand. Estadística agrícola de la República, San Miguel Tlanichico, January 11, 1900. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 4; Estadística agrícola de la República, Tarimoro, Guanajuato, July 15, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 1.

annotation running down the column or below it. Fewer officials filled in the columns for women, boys, and girls, but there too the norm was a single number of cents per day. The realities of indebted labor, indentured labor, seasonal labor, familial labor, and imprisoned labor all faded in the face of regimented rows of individuals working at a set rate by the day.

Taking these rates at their face value, we see hired hands as commonplace no matter the size of an agricultural property; we see also the broad use of men, women, boys, and girls as laborers earning pay in their own right. Within municipalities, daily wages for men generally differed by a few cents between properties, with small and large alike listing rates of pay of between 2 cents and 1 peso. There was little correlation between the size of the property and the pay rate.<sup>80</sup> Across the country, the average men's wage was 30 cents, the median 25. About 25 municipalities listed pay ranges, rather than specific rates, that revealed large internal disparities. Properties in Purificación, Jalisco, for example, listed ranges as great as 2 to 31 cents.<sup>81</sup> Municipal officials were slightly more likely to use the ditto marks or an annotation for the whole municipality to aggregate information for small properties than for large, but plenty of large haciendas, which respondents generally listed first, simply set the mark for the rest of the municipality.

Regionally, the agricultural survey casts doubt on our long-held generalizations about pay. Northern states consistently reported wages at the higher end of the range for male workers, but so too did export-oriented regions in the south. Historiography there has long focused on southern debt peonage and extortion, "slavery disguised" as the muckraking journalists of the era would have it.<sup>82</sup> While southern states like Oaxaca, Chiapas, Yucatán, Guerrero, and Morelos had some of the lowest daily wages reported nationally, they also had some of the highest in regions dedicated to crops like coffee, henequen, and sugar. Many of these municipalities also reported more and smaller properties than the average, undergirding work I have done elsewhere to show how the continuing availability of land in southern Chiapas undermined efforts to

80. In his study of Mexico's presence at World's Fairs, Mauricio Tenorio-Trillo suggests that the wages reported were likely exaggeratedly low in order to present the countryside as a profitable place to invest. In total, however, the averages and medians for the country are about where scholars have noted them to be, with the upper end of wages markedly higher than Tenorio-Trillo might have assumed. Tenorio-Trillo, *Mexico at the World's Fairs*, 129.

81. Estadística agrícola de la República, Purificación, Jalisco, June 29, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 51, exp. 9.

82. Friedrich Katz, "Labor Conditions on Haciendas in Porfirian Mexico: Some Trends and Tendencies," *Hispanic American Historical Review* 54:1 (February 1974): 1–47, is the classic study. See also Gilbert M. Joseph and Allen Wells, "Summer of Discontent: Economic Rivalry among Elite Factions during the Late Porfiriato in Yucatan," *Journal of Latin American Studies* 18:2 (November 1, 1986): 255–282; Alan Knight, "Mexican Peonage: What Was It and Why Was It?," *Journal of Latin American Studies* 18:1 (May 1986): 41–74; and Sarah Washbrook, "'Una Esclavitud Simulada': Debt Peonage in the State of Chiapas, Mexico, 1876–1911," *Journal of Peasant Studies* 33:3 (2006): 367–412.

capture labor for plantation work.<sup>83</sup> Municipal officials' reporting in the 1899 agricultural survey suggests that similar outcomes may have been the case throughout the export-oriented south.

Officials reported less frequently on wages for women, boys, and girls than they did for men, and always reported them paid at lower rates.<sup>84</sup> Women tended to make 50 to 75 percent of what men made (18 cents on average, a median of 15.5 cents). Boys consistently earned half of a man's wage (15 cents on average, with a median of 12 cents). Girls received a wage equivalent to a quarter to a half of a man's daily pay (11 cents on average, with a median of 12 cents). While municipal officials did not always include workers other than adult men in their tables, the presence of women and children as wage workers in the 1899 survey is stronger than national censuses from the years surrounding it would suggest. Representations of labor in those censuses were notoriously problematic, as the categories for kinds of work were drawn from the French Bertillon system which emphasized urban and industrial work over agricultural labor. As scholars such as Francie Chassen-López have shown, the flattening of rural work into a bare four columns, as compared to dozens for telegraphists and watchmakers and florists and so on, particularly underserved women's work. Her investigation of local reports on wages and property claims through repartition of village lands in Oaxaca makes clear that women represented a key part of rural life beyond the home.<sup>85</sup> In the 1899 agricultural survey, even if the kind of work beyond day labor was not indicated, Fomento and Agricultural Society technocrats did strive to see and count the work everyone did.

Yet not every municipal official followed suit. An equal number of officials included notes on women's work as explicitly stated that women and girls were not employed, providing notes with explanatory phrases like "*no hay*" (none), "*no se les da ocupación*" (they are not given work), "*no se ocupan*" (they are not occupied [in this work]), or "*no se ocupan en jornales*" (they do not work for a daily wage). Other responses were "*no se ocupan en la agricultura*" (they do not do farm work), "*casi no se ocupan las mujeres. . . por jornal*" (women are generally not employed at a daily wage), "*no se usa*" ([they are] not used), "*no se utiliza*" ([they are] not utilized), and "*no trabajan*" (they do not work). These explanations also appeared in the column for boys, but less regularly than in the columns for women and girls: some 1,228 properties included

83. Casey Marina Lurtz, "Insecure Labor, Insecure Debt: Building a Workforce for Coffee in the Soconusco, Chiapas," *Hispanic American Historical Review* 96:2 (2016): 291–318.

84. Some 88 percent of properties indicated wages for men, 64 percent included boys' wages, 19 percent included women's wages, and 12 percent included girls' wages.

85. Chassen-López, "Cheaper Than Machines": Women and Agriculture in Porfirian Oaxaca, 1880–1911."

phrases like this for women, 1,300 for girls, and only 288 for boys. Such language was used for men on only 19 properties.

Most municipal officials simply limited themselves to the survey item as given—the “*promedio de los jornales diarios*” (average of daily wage)—tailoring their local reporting the government’s generalized push for contract wage labor represented in labor regulations and agricultural modernization literature of the day. Yet a few included language that made clear that other modes of employment persisted. The variety of phrases used to explain the absence of women’s and girls’ wages is one place this can be seen, particularly in those phrases that made clear that it was the “*jornal*” part of the column—the daily wage—that resulted in women and girls’ exclusion. Thus, they implied that while women and girls might indeed take up agricultural work, they were remunerated for it in other ways, perhaps by having their labor covered by their husband’s or father’s wage, or through a sharecropping arrangement.

A very few municipalities further explained their local labor arrangements to show how the wording of the column did not do them justice. Some places listed monthly pay rather than the *jornal diario*, pointing to something more akin to a salary. Others instead specified the number of men working on the property and gave their total pay, bringing out the importance of having sufficient people available to labor, as well as highlighting a seemingly low average wage.<sup>86</sup> One municipal official in Michoacán wrote that “The daily wage is very rare here because, in general, every farmer sows what he personally needs, in such small scale that the crop to which he dedicates himself is not worth mentioning.”<sup>87</sup> Finally, three municipalities in Chiapas distinguished between wages for indebted laborers and wages for those not indebted, with indebted laborers earning a few cents less on average.<sup>88</sup>

The respondents’ insistence on differentiating among workers and their wages instead of providing a single answer points again to how the survey categories dictated by officials at Fomento and the Agricultural Society flattened local variation. The municipalities that insisted on providing large ranges for their daily wages instead of a single average figure, and the municipalities that distinguished between indebted and non-indebted workers (“*el trabajador no es endeudado*”)—and others—remind interpreters of the data

86. See for example *Estadística agrícola de la República*, Iturbide, Guanajuato, December 20, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 53, exp. 1.

87. “El jornal es tan escaso en virtud de que en lo general cada agricultor siembra personalmente lo que necesita, en tan pequeña escala que no es digno ni de mencionarse el cultivo a que se dedica.” *Estadística agrícola de la República*, Coalcomán, Michoacán, September 30, 1899. AGN, Fomento y Obras Públicas: Exposiciones, caja 52, exp. 1.

88. *Estadística agrícola de la República*, Chiapa de Corzo, Ixtapa, and Acala, Chiapas, AGN, Fomento y Obras Públicas: Exposiciones, caja 52, exp. 4.

that agricultural labor was not a uniform category of work. Beyond this, historians also remind us that the jornal was not always precisely daily rate of pay, but might instead be a piecework metric—based on the quantity of coffee picked or land tilled or sugar planted.<sup>89</sup> Yet fewer municipal officials pushed back against the strictures of categorization with regard to labor than to other aspects of agriculture presented in the survey. Was this just exhaustion at the end of an overly detailed table? Was it a generalized embrace of wage labor as the desired mode of employment? Or was it a representation of the realities of increasingly formalized agricultural labor? Additional research based on hacienda records can bring us closer to answering these questions in years to come.

## CONCLUSION

The responses to the request to standardize descriptions of daily wages provide both implicit invitations to future research and an apt place to conclude this article. The dataset and ArcGIS maps and feature layers that help visualize the collected statistics hold so much more than I can tease out in not much over 10,000 words. Yet the data do require caveats, and I have attempted to lay those out over these pages. With about half of Mexico's municipalities represented in the dataset my research assistants and I have built from the 1899 agricultural survey, the temptation is strong to push forward with statistical analyses and comparisons for which there are no other sound extant sources. Those government officials who compiled and archived the survey data could not have known that a revolution was just a decade away, but we as scholars looking at that data can see the tumult on the horizon. Our landscapes of Mexican agrarian life for 1900 remain, despite a century of effort, a patchwork, and that patchwork is heavily focused on regions that came to the revolutionary fore in the 1910s. Our understanding of agricultural productivity rests on export statistics from ports and customs incomes. The dataset I present, in its representations of so much of the countryside—40 million hectares at least!—provides a new albeit incomplete landscape to complement and complicate these other vistas. Even as everything I have written advises against making definitive assertions about Mexican agriculture in 1899 based on this dataset, its components insist on the persistence of mixed scales and modes of production well into the period we characterize as the export boom. I invite others to use it to build new national narratives that avoid Revolutionary precursorism and instead reckon with the persistent diversity of Mexico's agrarian activity.

89. Lurtz, *From the Grounds Up*, 127; Washbrook, "Una Esclavitud Simulada," 397.

Beyond bringing focus to the variety of agricultural modes of production, the dataset and attendant maps reveal much about the ongoing process of state consolidation and the building of a shared understanding of what made Mexico, Mexico. The 1900 Paris Exposition was an opportunity to show off the country's modernity, its pavilion a representation of the nation's participation in the global celebration of order and progress. While architectural feats gleamed brighter and imported villagers were more picturesque, statistical compendia and collections of legal codes and reproductions of patents also held center stage in placing Mexico among peers. The agricultural statistics that did not make it to France were another part of this global experience and also an expression of modernity. They were not unusual—neither in Mexico nor in the broader world of technocrats and academics and local functionaries who sought to make tabular data live up to its promise as the science of the state. Data that confounded expectations and evaded calculations was part and parcel of the ongoing dialogue between state actors and those they sought to standardize and manage accordingly, wherever in the world they found themselves.

Statistics are a favored source for representing dominant narratives of state-building and state power. They are a key recourse in the process of creating a shared understanding of the state, its bounds, and its authority, but they can also reveal the state's susceptibility to undercutting its own aims by way of too much abstraction. In some ways, the column headers of the 1899 agricultural statistics fit well within this schema. Despite their accommodation of complexity in other moments, even to the extent of requesting thorough detail, officials at Fomento demanded in the 1899 survey a kind of standardization and abstraction that they ought to have known was impossible. Yet, where some might expect refusal or evasion on the part of those who received the survey, we see instead the state's project confounded by local efforts to comply. This was not the "traditional practice of concealment in the Mexican rural world" that scholars like Pablo Riguzzi have blamed for the lack of agricultural data from the era.<sup>90</sup> Instead, it was an overabundance of information and an expectation on the part of local officials that omissions or brevity in the detail they provided would be made up for by data they had sent to the central government in earlier data-gathering attempts. Statistics are indeed a representation of the process of state-building, but we can see from the 1899 survey results that the process is one of feedback and conversation rather than one of mandates and force.

The Mexican government had specific reasons for founding a new Department of Agriculture and an independent Agrarian Commission separate from the

90. Riguzzi, "From Globalisation to Revolution?," 351.

Department of Fomento in 1909.<sup>91</sup> A younger generation of technocrats saw the environmental and economic crises of 1906 and 1907, when Mexico had had to import foodstuffs in response to drought and the global financial collapse, as motivation for change. Already Fomento had turned its attention to the kinds of subsistence crops Mexican producers reported in the 1899 statistics, finally paying attention to cattle diseases and corn varieties as well as the promotion of exotic silkworms and export crops like henequen. The National Agricultural School sponsored by Fomento reopened in 1908 with a focus on scholarship students from the provinces and the study of staple grains and national markets.<sup>92</sup> Mexican technocrats finally saw the trees for the forest, recognizing that the overall picture of prosperity they had painted at home and abroad was fragile, fraying, and most definitely not inclusive of everyone. The governments that followed the Mexican Revolution built on their insights—Andrés Molina Enríquez was not the only one to hold a position in both the Porfirian and Revolutionary bureaucracies. Even so, the urge to produce and support nationalizing narratives that erased regional diversity could not be left behind. Now, though, as scholars are increasingly showing, it was the ejido and the campesino who would be generalized outward from central Mexico as natural, pervasive, and persistent.<sup>93</sup>

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91. Mexico, Secretaría de Fomento, *Memoria 1909–1910*, v.

92. Xóchitl Ninel García Vázquez, “La configuración de la Escuela Nacional de Agricultura: la enseñanza científica agrícola, una alternativa para el desarrollo de la agricultura nacional,” n.d., 12–14; Mexico, Secretaría de Fomento, *Memoria 1909–1910*, xxxiv.

93. Christopher Robert Boyer, *Becoming Campesinos: Politics, Identity, and Agrarian Struggle in Postrevolutionary Michoacán, 1920–1935* (Stanford: Stanford University Press, 2003); Emilio H. Kourí, “La invención del ejido,” *Nexos* 37:445 (2015): 54–62; Helga Baitenmann, *Matters of Justice: Pueblos, the Judiciary, and Agrarian Reform in Revolutionary Mexico* (Lincoln: University of Nebraska Press, 2020).