

**Data Collection in Revolutionary Mexico:
Statistics, Maps, and the Negotiation of Nationalism**

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“Statistics is history without motion; history is statistics in motion.”¹

“These days, we want to know everything and forget nothing. Life needs to confess to itself and take a test of conscience. Let’s grab life by the neck so that it makes that confession in the elegantly eloquent form of numbers, tables, formulas and diagrams. This is statistics: the confession that we make life make. One must never forget what Goethe said: my works are only a part of a great confession. We make of statistics the schematic, numerical confession of life. Life should confess to itself.”²

I. Introduction

This article analyzes the role of data collection during the Mexican Revolution, especially in the two decades following the end of its armed phase. In the 1920s and 1930s, Mexico’s revolutionary state sought to expand agricultural production and land redistribution as part of a broader program of national reconstruction. Such goals depended upon the collection of statistics and the elaboration of maps by multiple federal offices. Most significantly, this article traces the work of statistics collectors and mapmakers associated with the Ministry of Agriculture (SAF) and the Department of National Statistics (DEN), the two most important offices charged with data collection during the Mexican Revolution.

Part one of this study traces the roles of statistics and maps around the world. Scholars have demonstrated that statistics and maps intervene and are used in many ways in the relationships between nation-states and subject peoples. Much of the attention has focused on how states use the data they collect. First, statistics and maps represent realities in statistical terms that are meaningful to state officials. The information provided by such representations is then used to inform state policy, especially to dominate both the land and the people that occupy it. Policies of military domination and colonization, as well as capitalist production, have all been linked to the collection and use of statistics and maps in the service of the state. At the same time, much recent research demonstrates that such domination is not easily achieved.

Societies often negotiate, and use statistics especially, to improve the conditions of their lives. Equally importantly, statistics and maps become essential tools in the negotiation of nationalism, as states and societies debate the extent and meanings of national identities. Especially in cases of weakly shared national identities, states have often turned to numbers and maps to help “sell” images of unified nations.

Part two of this article traces the meanings and uses of statistics and maps in Mexico, both prior to and immediately following the revolution. Data collection served similar purposes in Mexico as elsewhere. From the Aztec Empire to the Mexican Revolution, statistics and maps have been used to represent realities to inform state policy to dominate the territory and its inhabitants. Over that same period, data collection especially served the purposes of nation-building, as state authorities have attempted to create national myths, as well as viable and productive nations under conditions of weakly shared national identities. One important difference after the revolution involved the policy of land distribution. Not merely aimed at dominating people, statistics and maps were employed to help improve the lives of Mexicans in the wake of a destructive civil war. At the same time, however, DEN and SAF data collectors encountered numerous obstacles to achieving their goals in the 1920s and 1930s. From rural Mexicans who lied to data collectors and fought over land boundaries, to local officials lacking interest in statistics collection or land reform, federal officials discovered the tasks of representation, and expanding production and redistribution to be difficult indeed.

Part three concludes by analyzing the many methods chosen by revolutionary data collectors to overcome the obstacles placed in the way of their efforts. Most importantly, federal data collectors turned to negotiation as the principal means for achieving their goals. The negotiation took place on two levels. First, data collectors had to negotiate with all Mexicans

during the collection process itself, in order to convince them to participate and provide the accurate details of their lives to unknown state officials. To do so, the DEN, SAF, and other offices turned to a discourse of revolutionary nationalism, to convince Mexicans that it was their duty to cooperate with data collectors. Second, state officials then employed the statistics and maps that resulted from these data-collection efforts in a different kind of negotiation of nationalism, this time aimed at expanding production and land redistribution simultaneously. In the process, the revolutionary state encountered new forms for presenting statistics and maps that aimed to demonstrate the unity of the revolutionary state and nation to all Mexicans.

By analyzing the data-collection process in revolutionary Mexico, this article both confirms and advances our understanding of the role of statistics and maps in the relationships between modern states and societies. For one, the analysis demonstrates that data collection in Mexico was used for the same purposes as elsewhere. At the same time, by differentiating the *use* from the *gathering* of numbers, this study shows that not only can maps and statistics be used to help build nations, but so, too, can the process of their collection. As a result, maps and statistics and their collection not only help make societies legible to states for policymaking purposes; they also help make states and nations legible, and hence legitimate, to the societies they seek to govern.

Statistics and Maps, States and Societies

All governments, from the ancient to the modern, require data. Whether in the form of figures of latitude and longitude, production of agricultural or mineral resources, rates of births and deaths, or some other measure usually in the form of numbers or statistics, all states gather data regarding the natural and human resources they command. More than merely gathering

data, though, states also present their findings in many forms for different audiences. Whether as tables for merchants, maps for land surveyors, or bar graphs for congressmen, the forms of presentation are all visual representations of the data originally collected.

While often treated separately by scholars, statistics and maps have shared a role as part of the data-collection process between states and societies for centuries. Statistics, more than “numbers” or “numbers of things,” but the “administrative activity involving the recording of various data, leading to incontestable figures,” has ancient roots.³ So, too, does the construction of maps. Not only highly developed and organized states, but Eskimo, American Indian, and even nomadic desert civilizations for centuries have demonstrated the “basic importance of cartography to man.”⁴ Beyond their origins, statistics and maps have both been viewed as tools of states in the sixteenth and seventeenth centuries, as mercantilist powers in Europe vied with one another over increasingly global spoils.⁵ Moreover, both statistics and mapping have been linked to the history of modern nation states in the wake of the dual revolution, both democratic and industrial, as the first half of the nineteenth century in the North Atlantic world saw an explosion in censustaking and mapmaking among nations.⁶

Statistics and maps share much more than historical ties to the rise of nation-states. Maps are, after all, merely visual forms for displaying statistical measures of location, or, in the words of Peter Lewis, they are “scales for measuring the property location of objects.”⁷ Moreover, the nineteenth century witnessed a particular marriage of statistics and maps with the development and widespread use of special-subject or thematic maps. Designed “to serve some special purpose or to illustrate a particular subject,” to map land-use patterns or agrarian-reform totals for example, the thematic map “uses coastlines, boundaries, and places...only as points of reference for the phenomenon being mapped.”⁸ Of most interest to thematic mapmakers of the

early nineteenth century were the enormous disruptions associated with industrialism, as statisticians measured and mapped distributions of poverty, crime, sanitation and disease across the European, particularly the British, landscape.⁹ By mid century, thematic mappers had mapped the world's trade winds, geological features, temperatures and climates, population densities, and many other characteristics.¹⁰ In the words of Karl Pearson, a founder of modern statistical methods, "statistics, mental constructs that could readily be mapped onto the world," constituted a key concern of mapmakers, statisticians, and statesmen in the nineteenth century.¹¹

Research has especially detailed the many ways that statistics and maps have been used by modern states in their relationships with societies. First, states need to collect data in order to represent largely unknown realities. According to Karl Metz, one of statistics' greatest benefits in an age of industrial transformation in the nineteenth century was their ability "to describe the world objectively."¹² In a broader sense, Jane Caplan and John Torpey argue that all modern information gathering aims at making populations "visible to the state" for the first time.¹³ Particularly since the nineteenth century, data collectors have sought to describe or represent the natural and human resources existent within state boundaries.¹⁴ Statistics and maps have been essential tools to represent a nation's or locality's or even the world's geological characteristics, water or mining resources, boundaries, communications networks, or mineral deposits, among many other measures.¹⁵ The result of data collection, then, is a wide array of what James Scott calls "maps of legibility," representations that seek to make a land's natural and human resources known or "legible" to state officials.¹⁶

States do not collect data for the mere act of representation.¹⁷ Because states gather data in order to use it, scholars have demonstrated how maps and statistics "reflect and sustain power."¹⁸ Scott's maps of legibility might be viewed, then, as what Anthony Giddens calls

“authoritative resources,” information and knowledge collected by states and often presented in numerical fashion, that provide governments with the necessary authority to act.¹⁹ In the case of statistics, “quantification has been part of a strategy of intervention, not merely of description.”²⁰ That is, states represent realities in statistics and maps due to a “need to know a nation in order to govern it.” In this sense, Alain Desrosières draws the distinction between the “descriptive” and “prescriptive” meanings of data and its collection, as statistics and maps have served decisionmakers in developing all kinds of policies, from tax and settlement programs to communications, commerce and even conquest.²¹ According to Quételet, a critical player in enhancing states’ use of statistics in the nineteenth century, statistics had become “the very basis on which all good legislation must be grounded.”²²

Scholars have long debated the beneficial or prejudicial nature of the policies informed by statistics and maps. Some emphasize how statistics, at least in theory, emerged at a time of Enlightenment ideals regarding the state’s need to promote progress for all citizens. Michel Foucault, for example, viewed statistics as essential tools in the state’s capacity to serve as the “good shepherd” in order to promote citizens’ well-being.²³ Dipesh Chakrabarty added that “measurement is central to our modern ideas about fairness and justice and how we administer them—in short, to the very idea of good government.”²⁴ And Edward Higgs noted how data collection stems from states’ “duty to introduce change that will create a better society.”²⁵

Beyond theory, statistics have been linked historically to the emergence of policies of social reform aimed at the improvement of citizens’ lives in nineteenth-century Europe. In England, for example, the collection of “social statistics became the principal means of investigating and discussing the social question,” especially issues related to the misery and poverty associated with industrial transformation. All social-reform policies, which reached

their apex in the 1830s and 1840s, had as their base public pressure stirred by statistical studies of the impoverishment and poor health of English workingmen and women.²⁶ In Napoleonic France, too, social policy, particularly in the arena of public health, emerged in the aftermath of the publication of incontrovertible statistical studies of disease.²⁷ In Germany, the rise of centralized statistics offices under the leadership of Ernst Engel around the time of unification and industrialization led to a broad array of legislation aimed at the protection of workers, including disability and retirement benefits, among others.²⁸ And since the nineteenth century, particularly census operations have provided a framework for citizens to pressure public officials, especially in the United States, to promote policies aimed at improving standards of living. By debating census categories and the policies to pursue in their aftermath, citizens of many countries have been able to “exercise and uphold their rights” as a result.²⁹

More often than not, however, scholars have emphasized statistics’ and maps’ role in extending states’ domination over territories and peoples around the globe. First, data collection has been shown to serve the purposes of legitimizing authority over territorial spaces.³⁰ Both statistics and maps have been linked to states’ efforts to control trade routes opened up by increased contact among nations, particularly in the early modern world.³¹ More importantly, data collection has been linked to warfare. Particularly maps have been used by states to defeat an enemy on the battlefield, and to lay claim to that territory through the elaboration of new maps.³² In the words of Thongchai Winichakul, “making wars means making maps.”³³ Such warfare has also linked states and data collection through the process of colonialism and empire building.³⁴ Sean Redding, for example, has shown the centrality of censuses to colonial projects in South Africa.³⁵ And speaking of British rule in India, Chakrabarty notes how the colonizers’ “techniques of government were very closely tied to techniques of measurement. From surveys

of land and crop output to prospecting for minerals, from measuring Indian brains...to measuring Indian bodies, diets, and life spans..., the British had the length and breadth of India, its history, culture, and society, mapped, classified, and quantified in detail that was nothing but precise even when it was wrongheaded.”³⁶

Statistics and maps have also been used by modern states to dominate people, not just the land they occupy. According to Theodore Porter, “numbers have often been an agency for acting on people, exercising power over them....Numbers turn people into objects to be manipulated.”³⁷ In her study of numbers in nineteenth-century Italy, Silvana Patriarca argued that statistical studies turn “the people” into “a fundamental resource to be governed.”³⁸ For one, cadastral maps have long been employed by states in order to reform tax codes and raise revenues on the backs of property holders.³⁹ Moreover, the domination advanced by data and its collection has been associated with Michel Foucault’s notions regarding state practices of “surveillance” connected to the disciplining and punishing of subject peoples.⁴⁰ J.B. Harley stressed the idea that maps are used by the powerful over the weak. He wrote of “undeclared processes of domination through maps” that lay at a level of symbolic meaning that were more “subtle and elusive,” but no less powerful.⁴¹ According to Derek Sayer and Philip Corrigan, the weak are working-class men and women, and statistics have become a method for states and elites to extend capitalist relations of production, to expand the power of one class over another.⁴² For Karen Piper, maps have been essential tools in the extension of racial domination, of the Anglo races over others around the globe.⁴³ More than people, so, too has their knowledge been dominated and even eliminated or forgotten as a result of data collection. In the case of Siam in the nineteenth and twentieth centuries, maps became critical tools in what Winichakul calls “the displacement of geographical knowledge,” paving the way for people to imagine a unified Thai

identity. Not only people, but their ways of thinking about and seeing the world around them have been transformed by data collection.⁴⁴

Such domination has not come easily, as subjects and citizens around the world have negotiated the use of statistics and maps.⁴⁵ Particularly contested have been statistics, due to their attempt “to arrange an unruly humanity into comfortable categories.”⁴⁶ Thus, many historians have pointed to citizens’ successful resistance to census operations. Either for the fear of increased taxation or the biblical consequences to be reaped from census efforts, peoples across the seventeenth- and eighteenth-century North Atlantic landscape resisted states’ data-collection practices.⁴⁷ And after censuses became more acceptable, citizen populations have taken to negotiating the definitions and use of certain census categories.⁴⁸ Most often, historians have demonstrated how census totals and statistics in general have been “used in negotiations” between states and societies, as numbers are employed by members of both sides to appeal to a broader public, to sway public opinion by the authority provided by statistics.⁴⁹

Central to research on these negotiations has been the use of statistics and maps in the construction of nations and nationalisms. Numerous scholars have traced the importance of statistics in the process of creating “unitary national identities.”⁵⁰ According to Silvana Patriarca, statistics in nineteenth-century Italy had a “constitutive function” as “nationalist liberals...enrolled statistics in the cause of national independence as one of their tools for the creation of a new ‘fatherland’.” Numbers “created a particular image of the national space, they gave a body to an abstract entity.”⁵¹ And if statistics can have that effect, surely so can maps. Winichakul’s study of Thailand, for example, analyzes “how nationhood has been arbitrarily and artificially created by...geography and its prime technology of knowing, mapping.” More to the point, his study is of how “A map created a nation.”⁵²

Such studies suggest that statistics and maps have been employed by nation-builders under circumstances of weak national identities. Alain Desrosières, in a study of statistical practices in the nineteenth-century North Atlantic world, argued that German approaches to and use of statistics differed from those of the British, French, and Americans, due to an “uncertainty in regard to the state, its consistency and legitimacy.” Not only were statistics offices housed in the Ministry of Interior (rather than in economic bureaucracies), but state data collectors like Max Weber also carried out statistical projects aimed at ascertaining how best to promote citizens’ sense of national sentiment.⁵³ And Winichakul argues that maps became a critical tool in the construction of a Thailand that concerned “itself with the preservation and promotion of the national culture as if it might suddenly disappear.”⁵⁴ That is, maps and statistics seem to be used by those nations most interested in “selling” national identities to dubious publics.⁵⁵

The Obstacles to Data Collection in the Mexican Revolution

State-sanctioned data collection in Mexico did not begin with the revolution. All centralizing governments, back to the Aztecs (who have been referred to as “good mapmakers”), have collected numbers and made maps in the service of the state.⁵⁶ David Buisseret has commented on “the richness” of Mexico’s cartographic traditions, for one.⁵⁷ Statistics were of interest to Spanish colonial governments, particularly that of the eighteenth-century modernizers, the Bourbons. In 1741, King Felipe V ordered the mass collection of statistics in order to obtain “certain knowledge” of the imperial territories, especially Mexico.⁵⁸ Beginning with independence in the early nineteenth century, state-sanctioned data collection became an even greater priority of national governments.⁵⁹ In 1823, state education projects called upon “geographical engineers” to help policymakers “know the country, faced with the possibility of a

separation of the territories farthest [from Mexico City], like Sonora and Sinaloa.”⁶⁰ And in 1833, President Gómez Farías established the National Institute of Geography and Statistics, a society of experts aimed at collecting statistics and making maps for national purposes. Later renamed the Mexican Society of Geography and Statistics (SMGE), this institution became what one observer later called “the *alma mater* of official statistics in Mexico.”⁶¹

One of data collection’s principal roles in Mexico has been to serve the purposes of nation creation. An analysis of the frontispiece of the Mendoza Codex, for example, demonstrates how pre-Hispanic maps often told foundational myths and stories about the Aztec people.⁶² Victor Manuel Ruiz Naufal, in a broader interpretation of pre-Colombian maps in Mexico, claimed that “they only had meaning as a function of the history or subject being narrated, and not for the mere description of the physical environment.”⁶³ The history or subject, whether in the Mendoza or Xolótl Codex, or in a map of the territory of Coatlinchan, was universally that of a people, a collective, a nation. Moreover, especially in the aftermath of independence, Mexican states and political elites confronted the question of national viability. As a result, local and national governments raced to compile data of the territories inherited from colonialism.⁶⁴ For José María Gutiérrez, one of the SMGE’s founding members, both maps and statistics held “extreme importance” for the “prosperity and good governance of the Nation.”

Early nineteenth-century statistics and maps focused on providing an image of a unified, viable nation. According to Leticia Mayer Celis, statistics’ primary role for early statesmen in Mexico revolved around “the formation of the national imaginary,” as statistics and their collection became tied to “the desires and illusions of the forgers of a new nation.” By compiling statistics on Mexico’s natural and human resources, early nineteenth-century data collectors and policymakers sought “to change, to recreate and to realize a utopia.”⁶⁵ Especially

following the U.S.-Mexican War and the Treaty of Guadalupe Hidalgo, which ultimately resulted in the loss of half of the nation's land to the United States, maps also became an obsession of Mexico's nation-builders, because they helped create the conditions under which a viable nation "could be more effectively imagined." In the 1850s and 1860s, many statesmen sought, through the creation of a national map, "To demonstrate that Mexico was something more than a concept, to legitimate Mexico's spatial and temporal existence, and to make visual arguments about its historical and geographical coherence." The crowning moment came in 1858, when Antonio García Cubas elaborated a national map that was, in the words of Raymond Craib, "a defining moment in Mexican nation-state formation."⁶⁶

A viable Mexican nation became more of a reality under Porfirio Díaz, and statistics and maps provided much support for the process. First, Porfirian mapmakers provided the dictator with fundamental geographical knowledge to dominate the country militarily for the first time, ushering in a period of stability known as the Pax Porfiriana. The crucial institution here was the Geographic-Exploration Commission, founded in the late 1870s under the pretense that statistics and maps were essential elements upon which "the future of the Republic depends." Its maps cleared paths for soldiers and administrators to the republic's far corners.⁶⁷ Such stability, long in the making in nineteenth-century Mexico, was then used, as was data collection, to carry out a second step of nation creation under Díaz: economic development. While the Ley Lerdo of Liberal governments during the Reform had linked mapmaking to the process of extending capitalist relations of production to the Mexican countryside, under Porfirio Díaz that practice was extended even further.⁶⁸ Porfirian statesmen used surveyors in particular to draw boundaries and make property lines where none had existed before, in an effort to modernize and expand agricultural production to feed more Mexicans.⁶⁹ Moreover, renewed efforts to make a new

national map sought to entice foreign investment by providing capitalists with an idyllic view of Mexican stability in visual form.⁷⁰ Foreigners even got in on the act, as international firms drew maps of a modern Mexico's extensive rail system that linked it to the United States.⁷¹ In 1882, the importance of statistics gathering for economic policy was reflected in the founding of the General Office of Statistics, the first federal bureaucracy charged with collecting statistics for state purposes. Of particular interest were numbers regarding agricultural production. In an agrarian nation, how much of which crop was being produced where was vital data upon which to make sound policy.⁷²

Recent research suggests that data collection in nineteenth-century Mexico was a process wrought with negotiation and resistance. According to Craib, most state efforts to fix boundaries were thwarted by recalcitrant rural populations who turned legislation like the Ley Lerdo into "wishful thinking." Campesinos resisted the efforts of states for a variety of reasons. For one, many farmers rightly feared that surveyors' boundaries would mean their removal to new plots of land far from families and homes. Moreover, the work of surveyors also seemed particularly tied to tax collection. In order to avoid new tax assessments, campesinos resisted the work of surveyors and statistics collectors, often by lying. In short, rural Mexicans had many reasons to fear, and hence to resist, the work of data collectors in the nineteenth century.⁷³

Surprisingly very little work on the role of statistics and maps in revolutionary Mexico exists. We know, for example, that maps were essential to military planners in the process of fighting a revolutionary war from 1910-17.⁷⁴ Other work tends to confirm that statistics and maps can be used to improve and dominate the lives of citizens simultaneously. Héctor Mendoza Vargas argued that maps and statistics "formed a part of the administrative modernization and control of the revolutionary state," although he provided little in the way of

specifics.⁷⁵ Craib has analyzed the contradictory nature of agrarian-reform land surveys, that while aimed at liberating campesinos and providing them with parcels of land, also led to enormous conflicts over the plots, their locations and sizes, among many other issues.⁷⁶

In theory at least, revolutionary data collectors in Mexico set out to use statistics and maps for purposes similar to those of states around the world. From the outset of the Mexican Revolution, and especially in the 1920s, state representatives called for an improvement of official data collection in order to represent realities that remained unknown to policymakers. In a 1921 book of maps of Mexico, National University professor Alfonso Pruneda wrote that “We know ourselves very little,” and suggested that maps were one way to ameliorate Mexico’s lack of self-knowledge.⁷⁷ Even more in demand among state officials was a centralized bureaucracy devoted to the collection of statistics. In 1923, one statistics official claimed that the Mexican state required knowledge regarding the country’s “vital elements,” and “that knowledge can only be acquired through statistical data collected scientifically.”⁷⁸ Referring to statistics’ ability to provide “photographic instants” of historical moments in numerical fashion, Juan de Dios Bojórquez referred to “The necessity that Mexico has, in this moment more than in any other, to know itself” through data collection.⁷⁹ Viewing data as one of the state’s primary needs, he argued in 1922 that the state could not continue “to feel [its] way,” deceived by the “suppositions or utopias of [its] economists.”⁸⁰ He suggested opening local statistics offices, to which agents could report, and from which a central office could collect the information gathered.

Mexico’s revolutionary political elites responded to these calls by building an extensive bureaucracy devoted to data collection and based primarily in the Ministry of Agriculture (SAF). In 1916, the Constitutionalist government created the National Agrarian Commission (CNA), a SAF dependency assigned with the job of surveying and redistributing land in the form of *ejidos*

(communal plots) that had been stripped from campesinos during the Porfiriato. While underfunded and largely inactive under President Carranza, the CNA employed a number of surveyors and sat atop state-level Local Agrarian Commissions (CLAs) that mapped the lands of many local communities in the early work of agrarian reform. The SAF was home to many other bureaucracies devoted to data collection as well. The Office of Geographic and Climate Studies, led by Pedro Sánchez, was charged with completing the country's first revolutionary national map.⁸¹ The General Office of Agriculture (DGA) was also home to the extension service, established in 1922, as dozens of regional agronomists traveled throughout the republic in order to collect data regarding farmers and their production patterns.⁸² The General Office of Statistics (DGE), established in 1882, also continued as a dependency of the SAF until 1922, when the Obregón administration responded to its critics and created the first autonomous federal bureaucracy devoted to data collection for the state, the Department of National Statistics (DEN). And while the DEN was separated from the SAF, the ministry maintained its own office of data collection, called the Department of Economy and Statistics.⁸³

The primary goal of these offices' data-collection efforts was to inform revolutionary policy. One DEN publication argued that "Statistics, in the precise language of numbers and graphics, exposes social acts, relations and laws and inspires certainty among those who govern."⁸⁴ Other DEN publications stressed how statistics would be used to determine "the future conduct" of the state and to "justify legislative measures and orient the work of the State."⁸⁵ And as the revolutionary state's growing role in promoting economic development became clear by the 1930s, Ramón Fernández y Fernández argued that "luxury" statistics of past days had by then become necessities and points of departure for state policymakers.⁸⁶ The

Mexican state collected statistics and made maps, then, in order to know the country's problems, and to seek their solutions.⁸⁷

One solution sought by data collectors in revolutionary Mexico revolved around expanding production, especially that of food, in the aftermath of a devastating civil war. In 1922, Ramón Corral Soto laid out a long list of the state's statistical needs if it hoped to achieve ample agricultural production: numbers on populations, climates, irrigation and communications resources chief among them.⁸⁸ Mario Hoyo argued that statistics were essential to the work of extension service agronomists, which demanded numerical data if the agent hoped to "truly be the Director of a region's agriculture" in order to expand production.⁸⁹ Juan de Dios Bojórquez argued that statistical data regarding agricultural production in Mexico would allow the state to better devise rational production and irrigation policies to provide more food for more people.⁹⁰ Another DEN piece stated the case more clearly and broadly. Statistics collection and use aimed at not only knowing the extent of Mexico's natural and human resources, but also at "improving and perfecting them so that they might be more productive."⁹¹

Data collection was also used to solve the problem of unequal land distribution. Clearly the surveyors employed by the National and Local Agrarian Commissions measured lands and made maps in the name of making good on the revolution's agrarian promises. Moreover, many of the CNA and CLA agronomists organized a National Agronomic Society in 1921 and dedicated themselves to placing "all of their influence before the [president of Mexico] so that he may excite State Authorities...[to] strictly comply with the agrarian laws" in the years ahead.⁹² In addition to the agronomists' maps, statistics were collected, it was argued, for the purpose of "social improvement" or "to improve the collective life" of Mexico.⁹³ More specifically, the 1935 census law established the need for a count of ejidos and their production "with the

immediate goal of achieving the effective improvement of the *campesino*.”⁹⁴ That is, state data collectors hoped that statistics would become “the science of social justice” in Mexico.⁹⁵

The effort to reconcile agricultural production and agrarian reform was elaborated within a framework of national reconstruction, and as a result, data collection was placed in the service of nation-building. DEN’s Director of the Office of Demography argued that statistics were necessary “if we want to carry out a solid and long-lasting work of reconstruction in our country.”⁹⁶ Another DEN publication claimed that “the federal government has understood that Statistics should be the baseline for national reconstruction.”⁹⁷ Just as importantly, maps became particularly persuasive tools for revolutionary nation builders. On the one hand, ejido maps became visual demonstrations of the new state’s commitment to the process of redistribution. And Ministry of Agriculture efforts to make a more precise national map provided Mexicans with representations of “the vast territory in which so much blood of heroes has been spilled” and reflected “the geographical unity, the supreme national unity” that supposedly existed as a result.⁹⁸ Pedro Sánchez’s national map, published by the SAF’s Office of Geographical and Climate Studies in 1921, was not only “the first serious cartographic work ever carried out in the country,” but more importantly, it was rushed to adorn the walls of as many state-funded schools as possible in order to educate students in the revolutionary unity of state and nation.⁹⁹

Despite data collection’s stated roles in revolutionary Mexico, state representatives encountered numerous obstacles to achieving their goals, especially the seemingly simple task of representation. For one, statistics collection, even after the establishment of the DEN in 1922, still suffered throughout the 1920s and 1930s from a debilitating decentralization that one employee referred to as “a disaster.”¹⁰⁰ While the 1922 and 1923 laws establishing the DEN and describing its powers ordered all federal bureaucracies to send their statistics officials to the new

DEN, the reality remained one of a multiplicity of offices collecting statistics, and using distinct criteria and definitions for the numbers collected. The problem was just as the law predicted: if the work of statistics collection “was granted not to one but various authorities, the public will be exposed to not knowing which of the many statistics presented are the correct ones.”¹⁰¹ At the DEN’s first national statistics meeting in 1927, Marte Gómez ridiculed government publications for providing contradictory numbers that could not be trusted as a result.¹⁰² Lacking a “unitary criterion” for statistics collection led simply to “disconcertment and doubt that result in the discrediting of official sources.”¹⁰³

Decentralization was related to another problem in data collectors’ efforts to represent rural realities accurately: the lack of uniform measurements across Mexico. As Ted Porter suggests, “Adequate description counts for little if the numbers are not also reasonably standardized.”¹⁰⁴ And in Mexico, especially in the 1920s, such standardization was far from complete. The differences in measures of weight across regions were startling in fact. In the same municipality of Aguascalientes, for example, a “carga” (load) of barley was equal to 180 kilograms, and the same “carga” of wheat equaled 184 kilograms. In Escobedo, Coahuila, a carga of barley weighed 138 kilograms, but a carga of wheat 161 kilograms. In Hidalgo, Michoacán a carga of barley weighed 93 kilograms, and a carga of wheat 161 kilograms. In Asunción Tlacolulita, Oaxaca, a “fanega” of beans weighed 100 kilograms, and a “fanega” of corn 80-84 kilograms. In Alaquines, San Luis Potosí, a fanega of beans weighed 80 kilograms, and a fanega of corn 70 kilograms. In Misantla, Veracruz, a fanega of beans weighed 90 kilograms, and a fanega of corn 85 kilograms. The measurement discrepancies also hampered the work of agrarian-reform surveyors and mappers, as similar variations in measures of surface area existed as well.¹⁰⁵

Differing measures stemmed in part from a language barrier standing between state data collectors and especially Indigenous populations. DEN and other state officials found the “aztecisms, or voices of Nahuatl origin, that live in the mouth of the Mexican farmer” to be particularly problematic. Although, the “tarascisms” in Michoacán, “mayanisms” in the Yucatán, and “zapotecisms” and “mixtecisms” in Oaxaca were equally troublesome, because local peoples used different words to refer to agricultural products, instruments, and many other items to be measured by state data collectors. “This lack of unification in the terminology is generalized in most industries, but particularly in agriculture,” one report read, and it was “prejudicial not only for technical ends, but also for commercial, industrial, and administrative [efforts]” as well. In Baja California, the word for wind (viento) was “coromuel.” The word for blood sausage (“moronga”) was “morcilla” in Morelos, Durango and the Federal District, “zorícua” in Michoacán, and meant “stuffed” (rellena) in Jalisco. The word “morrongo” meant “helper” or “servant” in Jalisco, Hidalgo, Durango and Sonora, but in Tabasco it meant tobacco, rolled and ready to smoke.¹⁰⁶ Data collectors were ill prepared to deal with the linguistic variations encountered during their work of representation in the 1920s and 1930s.

The language barrier reflected, in part, one of the most important obstacles standing in the way of data collection in reconstruction Mexico: campesinos themselves. One early DEN publication claimed that most Mexicans lacked the “common sense” necessary to provide “intelligent cooperation” to data collectors.¹⁰⁷ DEN Director Bojórquez later suggested that “the obstacles in the way of [data] collection are innumerable, because individuals have no interest in providing the information, and they fill out the forms with little care.”¹⁰⁸ After the 1930 census, DEN officials chalked up the lack of interest to the mental capacities of campesinos “like ours,” who were “in their majority ignorant.”¹⁰⁹ Other SAF officials considered land-reform

beneficiaries' resistance to data collection to be the result of local leaders' "apathy."¹¹⁰ Campesinos' ignorance of their land's boundaries also thwarted the work of agrarian-reform surveyors. As early as 1915, young agronomy students received little help from colonial documents and Morelos campesinos that could get no more specific than saying that "a large stone" should be the boundary, where no stone was to be found.¹¹¹

Campesinos resisted the work of data collection with more than their apathy or ignorance. At times, data collectors like Andrés Escalante Enríquez lamented how their statistics were "totally plagued by falsehoods."¹¹² Especially data related to property sizes were considered problematic by the DEN, because "some intentionally hide that data."¹¹³ Following the 1930 census, another DEN report referred to the "extended tendency" among many rural Mexicans that "one must hide or falsify" statistics related to one's own economic situation.¹¹⁴ Most data collectors chalked the lies up to people's fear that the statistical information gathered would be used to increase their tax burdens.¹¹⁵ One regional agronomist discovered that some ejidatarios lied regarding harvest amounts to avoid paying more into the ejido's fund, which was based upon fifteen percent of production and used for community projects.¹¹⁶

Campesino resistance to the work of land-reform surveyors could take a much more life-threatening turn. At times, the possibility for violence stemmed from differences of opinion among campesino communities regarding the rights to particular parcels of land. While redistributing land among the Zapatistas in 1915, for example, Marte Gómez found himself "between two fires," particularly those of neighboring villages, and the work of surveyors became one of "accommodating, convincing, and conciliating" rather than providing social justice.¹¹⁷ Gonzalo Durán's Morelos experience was similar. In Tetecala, the young surveyor busied himself with the division of land and water resources, especially that of a disputed lake,

between the villages of Miacatlán and Coatetelco. His work, however, was cut short when the villagers of Coatetelco attacked, actually firing on Durán for a supposed slight in the placement of boundary markers. Miacatlán's villagers protected the young agronomist while he feverishly corrected his mistake and finished the job.¹¹⁸ Violence, or the threat of it, over borders between rural communities constantly hampered the work of surveyors and agronomists.¹¹⁹

Surveyors also confronted landowners who sought to undermine the agrarian program. In the state of Puebla, hacendados attacked Ignacio Figueroa, president of the CLA, for having illegally revisited cases of land reform initially decided negatively. Claiming that such public functionaries were not "our caciques, but our servants," the Puebla landowners obstructed the commission's work and demanded justice.¹²⁰ In Yucatán, landowners threatened Francisco Pérez Sierra, CNA Delegate, saying that he would not "make old bones in the Delegation, cost what it may."¹²¹ In Guanajuato, CNA agronomist Luis Marfin had to be evacuated twice after local landowners sent representatives to frighten him off with gunfire and other assorted threats.¹²² And in the district of Abasolo, Guerrero, CNA delegate Luis Carrasco had to be provided with an army escort to carry out his duties faced with landowner resistance.¹²³ The threats also led to outright violence against surveyors. In Nayarit, Daniel Rios and another agronomist named Laureles attempted to carry out an effective agrarian program in the domains of the dreaded Aguirre clan. By 1921, the family's efforts to undermine the CLA's work led Rios to court, to defend himself from trumped up charges, and Laureles to his grave.¹²⁴ In August 1924, the CNA agronomist Jesús Guzmán was killed in the line of duty in Veracruz.¹²⁵ And in May 1929, José B. González became a victim of hacienda thugs connected to the landlord Samuel Guerra, who under the guise of the Cristero rebellion, attacked Montesa, Zacatecas ejidatarios and murdered the young agronomist, along with ten other campesinos.¹²⁶

Local officials joined in the effort to undermine the surveyors' work. Most times, such resistance took the form of a limited commitment to carrying out redistribution. Local Agrarian Commissions did not always receive the funds necessary to carry out their work. From the very beginning, agronomists working in the CNA and CLAs complained that "by virtue of the current organization agrarian reform is diminished instead of advanced," because "while one governor attempts to resolve the agrarian program of his state, another opposes it under a thousand pretexts."¹²⁷ In Tamaulipas, the efforts came from the anti-agrarian governor, César López de Lara. When Ramón Corral Soto was sent to serve on the state's CLA in 1923, the governor threatened his life and forced him to leave the state within twenty-four hours. The message was clear: no surveying would be carried out under López de Lara's watch.¹²⁸

Local officials also demonstrated apathy and incompetence in carrying out their statistical duties. During the Carranza administration, the SAF's General Office of Statistics pressured state governors and municipal officials to respond faithfully and in a timely fashion to federal requests for data regarding local production and population.¹²⁹ In a 1923 report, the DEN's Office of Demography reported that nearly two-thirds of Mexico's state governments "either did not send anything, or what they sent was totally deficient." The report added that for statistics collection to succeed, local governments needed to get data collection out of the hands of "lazy and stupid" officials and into the hands of "diligent and apt" individuals who would take the work of data collection seriously.¹³⁰ Throughout the 1920s, in fact, federal officials complained about the local employees who filled out forms incorrectly, making the DEN's work more inefficient and ultimately less accurate.¹³¹

Municipal officials' inability to aid the work of federal data collectors stemmed from serious budget limitations. In fact, even federal budgets severely strained the effectiveness of

data collectors in the 1920s and 1930s. Pedro Sánchez, Director of the SAF's Office of Geographic and Climate Studies, complained early and often about the "lack of elements and the continuous reductions of personnel" that his office suffered.¹³² Surveyors, agronomists, members of the National Agrarian Commission, and even campesino communities constantly complained about the lack of adequate personnel to carry out agrarian reform in an efficient, timely manner. Moreover, federal budget shortfalls forced data collectors to depend on the efforts of local state and municipal offices even less able to finance accurate collection methods.¹³³ From the early days of reconstruction, Bojórquez had demanded "the establishment of true statistics offices" at the state and municipal levels, which could be guided by the data-collecting extension agents.¹³⁴ Few were the states, let alone county governments, that had their own offices devoted solely to data collection. At a 1927 statistics reunion, DEN officials placed the foundation of state-level statistics offices among their top priorities. And while they presented the governors and their representatives with the minimum budgetary and personnel requirements to make such offices functional, most state governments were unable to follow the DEN's suggestions.¹³⁵ Municipal governments were even less able to follow suit. As a result, particularly agricultural production reports suffered from serious inaccuracies because statistics collectors lacked the funds to visit farms personally. This criticism was launched especially at the results of the 1930 agrarian census.¹³⁶ Without more money, however, it was the best federal data collectors could expect. "We know that using municipalities as the source of information leaves much to be desired," one report read, "but faced with the impossibility of finding a better source and the need to do statistics, we have no other" options.¹³⁷

Inaccurate production figures added to other obstacles standing in the way of planning to expand agricultural production across Mexico. In order to develop a national reconstruction

plan, data collectors required not only accurate production figures (which were difficult to obtain), but also detailed regional data regarding climates, soils, water, and other natural resources. The DEN and other data collectors quickly realized the need to “divide the country, in a tentative fashion, in agricultural zones.”¹³⁸ By dividing the country according to economic and agricultural lines, rather than according to arbitrary, political lines on maps, data collectors sought to provide state officials with an expert, technical plan for expanding agricultural production. Bojórquez claimed that one of the DEN’s principal missions had to be writing the “economic geography of Mexico.” He explained: “The object of this kind of work...is to point out the zones...of equal economic influence in the country, because political geography is no longer what most interests [us], but rather...the economic aspects of the regions of the Republic that for their geographic situations and natural boundaries have a similar life.”¹³⁹

The political territorial divisions, especially at the municipal level, compounded the problems of data collectors. Meaningful data collection could not even begin to take place without assigning commonly agreed upon labels to refer to Mexico’s political divisions. In 1918, SAF’s General Office of Statistics requested that each state governor provide the federal government with a map listing all municipal names.¹⁴⁰ Although, even if such maps existed, municipal names changed so quickly that the maps would be outdated prior to their printing. In November 1922, for example, the state of Chiapas eliminated 41 different municipalities, and changed the names of a few more. Three years later, the state created 11 new municipalities. In 1923, the state of Puebla, at the time comprising 27 counties, decided to create 175 new ones, making for a total of 202. Juan Ballesteros, director of the 1930 census, called the effort to maintain current maps of Mexico’s local communities and their names a “titanic labor.”¹⁴¹

In the end, surveyors and statistics collectors encountered obstacles from many corners of Mexico amidst reconstruction. Campesinos, large landowners, and local officials topped a long list of interests standing in the way of agrarian-reform efforts. And the DEN's data collectors in general seemed to encounter similar and widespread resistance, as "among those who resist rendering the data requested of them or consider this duty lightly and with little care are not only municipal presidents and *campesinos* of scarce comprehension, or industrialists afraid of fiscal intervention, but also local and federal judges and authorities for whom the utility of statistics should be self-evident."¹⁴² At times it seemed as if a national conspiracy to undermine the work of data collection existed.

Overcoming Obstacles: Negotiation, Maps of Legibility, and Nation-Building

Data collectors employed many strategies to overcome the obstacles they encountered, beginning with efforts to unify and centralize statistics collection in Mexico. In 1926, this process began when the federal Customs' Office eliminated its own statistics office, and sent all material to the DEN for compilation.¹⁴³ A year later, the DEN held the First National Reunion of Statistics to further discuss centralizing statistics collection among federal and state-level bureaucrats. Data collectors called upon President Calles to make the DEN the only federal bureaucracy "authorized to collect, concentrate, expound and publish statistics."¹⁴⁴ In 1928, DEN Director Bojórquez created the National Council of Statistics, comprised of officials from the DEN and all the cabinet-level ministries, in order to continue the centralization process.¹⁴⁵

These and other efforts that sought to centralize statistics collection did not solve the problem, however. First, the measures did not go far enough, according to some observers. In the early 1930s complaints surrounded the ambiguous nature of the legislation enacted, as many

bureaucrats did not know if the end goal sought was to completely centralize statistics collection in the DEN or to build a spirit of cooperation among multiple offices. Second, the National Statistics Council and the DEN lacked the authority to ensure compliance with its directives. And in January 1933, the DEN lost its own autonomy altogether, as it was incorporated into a new Ministry of the National Economy (SEN).¹⁴⁶ The centralizing efforts continued with limited success in the years ahead. In 1935, the SEN established an Office of Coordination and Special Studies to coordinate executive branch data-collection practices. Demonstrating the difficulties associated with centralizing statistics, the office's first goal was to discover which statistics were being collected by which offices. That is, by the mid 1930s, the Mexican state still lacked a unitary criterion for the collection of statistics.¹⁴⁷

Efforts aimed at centralizing bureaucratic practices included agrarian-reform policy as well. Since the early days of agrarian reform, many agronomists and surveyors had called for the CNA to become its own cabinet-level office, independent of the Ministry of Agriculture. In part, this desire aimed at overcoming jurisdictional issues between the two bureaucracies that helped undermine the agrarian work.¹⁴⁸ More importantly, though, many agronomists attacked state governors' stranglehold on the process of redistribution.¹⁴⁹ By centralizing the bureaucratic process in an autonomous, federal office, the agronomists hoped to remove this obstacle to redistribution. The pressure paid off in 1934, when the Agrarian Department replaced the CNA, and an experienced agronomist, Angel Posada, was its boss. From 1934-40, President Lázaro Cárdenas and the new Agrarian Department undertook an unprecedented redistributive effort that by 1940 saw nearly one-half of Mexico's cultivated lands in the hands of ejidatarios.

In addition to centralization, the DEN focused on making the process of gathering numbers more efficient to produce more accurate statistics. Monetary savings and efficiency

began in 1925 with the purchase of modern collating machines that helped the DEN process more data than ever before.¹⁵⁰ More difficult, however, were the DEN's efforts to eliminate their dependence upon local governments for statistics. DEN officials were clearly aware of the need for more personal contact with producers, in order to obtain firsthand information, rather than relying on second-hand anonymous questionnaires filled out by farmers or local officials.¹⁵¹ Some talk of carrying out direct surveys occurred in the late 1920s, but the personnel costs could not be covered by federal budgets.¹⁵² In 1934, critics still called for more "direct" methods of data collection to achieve more accurate representations of Mexico's rural realities.¹⁵³ Some small steps were taken, however. During the 1935 ejido census, for example, statistics collectors traveled to the farms of ejidatarios to collect the data required rather than force ejido leaders to travel to municipal offices to provide their reports, as had happened in the 1930 census.¹⁵⁴

Most importantly, though, data collectors turned to negotiation as a principal means to overcome the obstacles encountered in the 1920s and 1930s. Such negotiations started with convincing local officials to carry their part of the data-collection burden. One report referred to "the intense struggle that was waged with municipal and state authorities, to get them to send their data in opportune fashion."¹⁵⁵ The war began as one of words, as federal officials called upon state governors and municipal presidents to establish statistics offices, as required by law. In 1927, DEN officials invited local authorities from every state to the First National Reunion of Statistics in order to convince them to "cooperate with the work of [the DEN, by] efficiently providing the accurate data requested of them."¹⁵⁶ Shortly thereafter, DEN officials obtained presidential powers to enforce compliance. Within a year, only six states had failed to establish an independent *Sección de Estadística*.¹⁵⁷

The DEN also developed a propaganda campaign to convince all Mexicans to provide the honest and abundant details of their lives to state officials.¹⁵⁸ Elsewhere I have written about this campaign, which revolved around four issues: production, patriotism, privacy, and penalties.¹⁵⁹ Data collectors argued that cooperation with statistics collectors would lead to higher production, and better standards of living as a result. This claim often linked data collection with the health of the nation. In 1925, DEN officials claimed that statistics were “a necessity of all men interested in themselves, their families, and for the fatherland” as well.¹⁶⁰ Statistics collectors also emphasized the privacy of each informant’s report, because many Mexicans feared the use of their data for tax purposes. As early as 1923, officials clarified that their interest lay in “simply joint results,” rather than to single out individuals for harm.¹⁶¹ Finally, data collectors also came to stress the possible penalties for non-compliance. While monetary penalties were applied widely during the 1930 census, local authorities began collecting fines for those Mexicans not registering a child’s birth with civil authorities beginning in 1927.¹⁶²

The campaign was a work in progress that emphasized nationalism over time. Early on, the DEN demonstrated little interest in a concerted effort to convince Mexicans to participate with data collectors. Upon arriving in the DEN’s directorship in 1926, however, Juan de Dios Bojórquez launched a vigorous campaign that included sending out nearly 110,000 pieces of propaganda in the first year alone.¹⁶³ In 1927, the propaganda began in earnest, as “the [DEN] left its ivory tower to direct itself to the people, to make itself known and to be in contact with all social classes.”¹⁶⁴ That year, the DEN published *Estadística Popular*, a newspaper designed specifically to sell Mexicans on the need for statistics collection. During the 1930 census, DEN officials branched out beyond the indirect propaganda of pamphlets and flyers and newspapers to employ rural teachers, cultural missions, regional agronomists, and many other state officials in

the campaign. The central idea reiterated time and again was simple: all Mexican citizens shared a duty to provide the state with data in order to help build a great nation.¹⁶⁵ One DEN slogan summarized the idea succinctly: “To do statistics is to make the fatherland. Help us do it!”¹⁶⁶

The negotiations with local officials and rural Mexicans aided the state’s efforts to comprise a variety of “maps of legibility” that represented Mexico’s realities more accurately than ever before. Data collectors in the 1920s and 1930s scoured the countryside to provide accurate maps of the nation, its individual states and municipalities. Pedro Sánchez’s Office of Geographic and Climate Studies, which had published the national map that adorned school walls starting in 1921, continued its triangulation work throughout the decade to provide truly accurate measurements upon which to base a new map.¹⁶⁷ Other national maps began the process of getting to know the locations of the country’s most important natural resources.¹⁶⁸ Perhaps even more impressive was the work of censustakers in 1930, whose labeling efforts led to the first map in Mexican history to accurately reflect the current names and boundaries of every state and county in the nation.¹⁶⁹ This success, in fact, allowed future federal statistics to be compiled at the county level to great effect.¹⁷⁰

These maps became the base for writing Mexico’s “economic geography.” Agronomists in particular diligently detailed agricultural production in Chihuahua, Morelos, Yucatán and many other states.¹⁷¹ In 1929, Minister of Agriculture Marte Gómez commissioned an in-depth study of Morelos’s soils in the hope of creating an “agrological map” that could provide essential data to policymakers.¹⁷² In 1925, one agronomist, Carlos Terrazas Moro, claimed that his study of Chihuahua sought to write the state’s “agricultural geography” not only to expand local production, but that of the nation as well.¹⁷³ Many studies of the Laguna cotton region, which lay between the states of Durango and Coahuila, highlighted the need for studies that shunned

political, state boundaries.¹⁷⁴ Combined, the many disparate studies carried out by the SAF and the DEN began the process of dividing the national territory into more meaningful production zones for policymaking purposes.

The work of economic geography took many forms in the 1920s. In 1923, the SAF's extension service undertook in-depth studies in 99 counties across Mexico with the hope of detailing what it called the "agricultural geography of Mexico."¹⁷⁵ In 1924, the same office divided Mexico into thirty-six "regions of similar climate," each one the responsibility of an extension agent.¹⁷⁶ By 1928, the SAF's former office of pest and blight control had divided Mexico into six "zones of agricultural defense" that shared similar problems and could seek common solutions.¹⁷⁷ One division of production patterns that policymakers found particularly useful split the national territory into five zones—North, Gulf, Pacific-North, Pacific-South, and Center—that reflected "geographical unity and similarities in their climates and agricultural and economic features."¹⁷⁸ In 1926, federal data-collection offices began publishing most of their agricultural production figures according to this division. In 1927, DEN agronomists carried out an in-depth study of the entire Pacific-North region in order to begin detailing the five regions' distinguishing features. The resulting publication, entitled *Sonora, Sinaloa, y Nayarit*, sought to utilize economic geography to plan for an expansion of agricultural production nationally.¹⁷⁹

In the 1930s, the state funneled more resources into the work of economic geography. By 1934, data collectors could analyze not only national production totals but also view their regional distributions. In a study of Mexico's six most remunerative agricultural products (corn, cotton, wheat, sugar, alfalfa and henequen), the SAF's Ramón Fernández y Fernández delineated which products were produced in which regions and in what amounts for the first time.¹⁸⁰ During the Cárdenas administration, detailed studies of economic geography in Michoacán,

Hidalgo and Nayarit continued to provide policymakers with profound knowledge of local realities.¹⁸¹ More importantly, the Office of Coordination and Special Studies, established in 1935 to better coordinate federal statistics collection, created an Office of Economic Geography to divide the nation into even more agricultural, economic, and geographical regions for the purpose of statistical presentation. The regions began by combining municipalities that shared certain characteristics into what were termed “statistical districts.” Those statistical districts that shared other characteristics then constituted “economic regions.” Finally, multiple economic regions comprised “statistical zones.” While Gonzalo González, the agronomist in charge of the new office, complained that such a division would be “difficult” to accomplish, it was necessary, because statistics needed to be “practical” by “respond[ing] to the real needs of the economic and social environment” of Mexico.¹⁸²

The “economic geographers” hoped to foster Mexicans’ sense of nation and spirit of nationalism with their work. One purpose of the study *Sonora, Sinaloa y Nayarit*, for example, was “to encourage all citizens, not just from the Northwest, but from all of Mexico, to work, always united, toward the greatness of their fatherland.” By acquainting all Mexicans, who “in their majority do not know the beauties of our territory,” with an unknown region, the DEN hoped to spur nationalist sentiments with their study.¹⁸³ The same theory held for data collectors’ work on the Yucatán and Baja California. These two states, far from the nation’s capital and with strong historical ties to the United States, preoccupied many Mexico City statisticians. By compiling trade figures and presenting maps of the states for public consumption, the DEN sought to incorporate distant lands into the national imaginary and economy.¹⁸⁴ Fernando Foglio Miramontes stated the relationship between economic geography and nationalism more clearly in his pathbreaking study, in four volumes, of the state of

Michoacán. Worried about the numerous local communities throughout Mexico that remained cut off from national currents, he argued that “whatever action taken by the State aimed at changing those conditions” of isolation, “will have to begin necessarily from a base of Economic Geography.”¹⁸⁵ That is, knowledge of economic geography was necessary to build a nation.

Building a nation also meant collecting maps of legibility on Mexican society. In 1926, the DEN reorganized its statistical divisions into offices of economic and social statistics. The latter category, which included data on marriage and divorce, births and deaths, and migration, among many other measures, had become a top priority for data collectors whose mission was to represent the Mexican people and their habits in statistical fashion.¹⁸⁶ Equally important for data collectors was the extraordinary diversity of Indigenous peoples scattered throughout the national territory. In 1934, the SEN published a national map, the result of years of study aimed at knowing the amounts and distributions of peoples speaking languages other than Spanish.¹⁸⁷ More than any other moment, the 1930 census allowed the state to get to know the work habits of its citizens. The result was another map of legibility, one that edited the international occupational categories used for the 1930 census that did not seem to fit with Mexico’s reality.¹⁸⁸

More than representing human realities, the maps and statistics were also employed as tools in the negotiation of nationalism with all Mexicans. Two maps of legibility in particular aimed at tearing down the language barrier that stood in the way of building a unified nation. One dictionary of farming terms used throughout Mexico (compiled by census agents) sought two ends: “to understand the language of our farmers,” but also “to try to unify this language, perhaps to facilitate the job...of future statistical endeavors.”¹⁸⁹ A second linguistic map of legibility, one that translated local terms used to describe medical conditions, seemed even more urgent because the cause of nearly one-fourth of all deaths in Mexico could not be determined.

The DEN authors hoped that their dictionary would help determine the causes of death more accurately by educating the nation in the acceptable medical terminology.¹⁹⁰

Data collectors also struggled to unify measurements. While the hopes of census takers to collect their data in metric terms in the 1930 census were dashed early on, the result was a 300-page map of legibility that translated all local measurements into metric equivalents for future reference.¹⁹¹ As a result, many of the measures of the 1935 ejido census could be collected in metric terms.¹⁹² The metric campaign's success should not be exaggerated, though. Five years later, census takers once again toured the countryside in an effort to raise campesinos' awareness and use of the new measures. Their "sale" of the metric system once again turned to the discourse of nationalism. "The national unification of Mexico and the rapid progress of Mexicans," one propaganda piece read, "demand that there be only one system of measures in the country." From 1939-40, census officials established "pro-metric" committees throughout the country to help unify national measurements to produce more useful statistical reports.¹⁹³

The statistics collected became weapons in the struggle to redistribute land and expand agricultural production. First, data collectors in particular utilized numbers to pressure presidents and governors to expand redistribution. The study *Sonora, Sinaloa y Nayarit*, for example, contained detailed statistics that showed the limited extent of agrarian reform in the three states. By 1926, a full decade after the CNA's establishment, .48% of Sonora's land, 2.13% of Sinaloa's land, and 1.66% of Nayarit's land had been redistributed to ejidatarios. Moreover, less than 1% of each state's farms had been affected by expropriation in the program. The study's authors used the numbers to attack the critics of agrarismo who exaggerated the extent of redistribution and claimed that the ejido would lead the country to ruin. "Evidently," the report concluded, "much that has been written or spoken in Mexico and abroad about

agrarian reform is the work of fantasy more than of serious meditation.”¹⁹⁴ During the Maximato, the agronomists particularly cited 1930 census statistics to complain about the limited extent of redistribution in the wake of presidential efforts to halt the reform.¹⁹⁵ And under Cárdenas, Fernando Foglio Miramontes published agrarian-reform maps of Michoacán demonstrating that in 1935 redistribution was limited to three of the state’s seven agricultural regions. The maps’ visual proof aimed to pressure for a true end to the state’s large estates.¹⁹⁶

Statistics also became weapons in the struggle to expand agricultural production. Agronomists throughout Mexico worked tirelessly in the 1920s and 1930s to promote the modernization of farming methods that could lead to expanded agricultural production. That modernizing project fell to extension agents, who received instructions to collect data on local conditions, including climates, soils and production patterns. Such data would enable the agronomists to determine which crops were best suited to which lands, and to lobby farmers to heed the expert advice.¹⁹⁷ In the process, statistics became “the indispensable base” upon which agronomists planned to expand agricultural production.¹⁹⁸ More generally, data collectors hoped that statistics could increase the productivity of all Mexicans. “It is necessary,” one DEN report read, “that small businessmen and farmers, that workers and all laboring men, make statistics the base of their daily activities.”¹⁹⁹

Thus, statistics themselves, not just the process of their collection, were used as state tools in a broad educational program aimed at all Mexicans in the 1920s. The DEN’s data collectors began their work believing that businessmen, government officials and social scientists comprised the audience for their statistics.²⁰⁰ By 1925, however, DEN officials began to realize that statistics needed to be placed “within the reach of everyone,” not just educated Mexicans.²⁰¹ The DEN’s new director in 1926, Juan de Dios Bojórquez, provided the reason for expanding the

audience of their statistics. “It is not sufficient that the exposition [of statistics]...be reduced to a diffusion of results among prepared elements.” Rather, he argued:

it is indispensable that the masses—who complain about the dryness of such work, who don’t understand numbers nor economic and social problems, who cannot take advantage of the limitless benefits provided to science by tables, diagrams and censuses—find some attraction [to statistics] that translates into interest in order to learn some important lessons about our collective life from the apparently barren sobriety of figures. It is necessary to educate the people so that they will cooperate with statistical work, and that statistics educate the people for life.²⁰²

Later, the DEN’s director elaborated his ideas further: “What’s so important about an office working constantly, silently and tenaciously to produce tables about social life,” he asked, “if those tables won’t be known by men? Statistics is not born in the moment that a table...is completed; rather, statistics begins when society knows the results of their elaboration and exposition.”²⁰³

State data collectors changed not only their intended audience, but also the forms of presenting their statistics as a result. Many officials realized that people felt little more than “repugnance” for the boring and seemingly useless and endless lists of numbers published by the DEN.²⁰⁴ Data collectors also worried that most Mexicans could not understand the statistics presented to them without in-depth explanations.²⁰⁵ As a result, the DEN began to rethink the forms of presenting numerical information, to include “picturesque elements” that “in a simple and clear fashion” would be more pleasing and understandable to an uneducated audience.²⁰⁶ Bojórquez argued that the DEN wanted “the masses to know the results, and for this it is necessary to present them in a form that is accesible, for its simplicity and attractiveness.”²⁰⁷ Such forms were numerous, from bar graphs and thematic maps to posters and movies.²⁰⁸

Of all the presentation forms, thematic maps became most important due to their usefulness as part of the state’s broader nation-building campaign. As stated before, thematic

maps allow statisticians to present numbers in powerful visual form. By the early 1930s, colored maps of Mexico demonstrating the distributions of the nation's natural and human resources fit the requirements of accessible and attractive numerical representations. More than their attractiveness, the thematic maps also became visual symbols in the state's effort to destroy the people's "prejudices" against statistics and their "ignorance" of numbers' importance for the nation. In 1934, the DEN, by then part of the new Ministry of National Economy, published *México en cifras*, a volume filled with thematic maps that used statistics collected during the 1930 census to provide a "clear and complete synopsis of national life." More importantly, the volume sought the "collective education" of the Mexican people.²⁰⁹ By showing Mexicans that statistics could be both interesting and useful, the study aimed to convince the people of their duty to provide their data to the state as a result.

The thematic maps did not only help make society legible to the state, but just the opposite. Throughout the 1920s, but especially in the 1930s, the DEN, SAF, and other data-collection offices published scores of thematic maps that showed in visual form just how far revolutionary policies had been carried by the government. In 1928, SAF's Federal Office of National Defense published a series of maps demonstrating the locations and numbers of committees organized to eradicate the swarms of locusts that devastated crops in the south and southeast of the country.²¹⁰ In 1933, Ministry of Education and SAF officials collaborated on a map showing the locations of all Rural Normal and Central Agricultural Schools throughout the country. The message was simple: the revolutionary government had lived up to its promises, in part by devoting resources to the education of teachers and farmers.²¹¹

State-produced thematic maps focused special attention on the fulfillment of the revolution's agrarian promises. The 1934 volume *México en cifras* began what became a steady

stream of colorful and picturesque maps reflecting agrarian-reform totals as measured by the censuses of 1930, 1935 and 1940. Following the 1935 ejido census, the SEN published *La reforma agraria en México*, another book of bar graphs and thematic maps reflecting “the work realized by revolutionary governments during two decades.” While one goal of the publication was “to extirpate the grave prejudices that are opposed to the improvement of statistical services,” it more importantly emphasized the attention given to agrarian reform by revolutionary governments. As a publication devoted almost entirely to “the ejido, ejidatarios, and the ejido economy,” *La reforma agraria* clearly reflected the state’s priorities.²¹² In 1941, the Agrarian Department published a *Memoria* with more elaborate maps reflecting the government’s extraordinary agrarian efforts from 1915-40.²¹³ Other maps showed the state’s investment in ejido credit as well. By mapping the placement of Ejido Bank offices and graphing the number of ejidatarios organized in and the amount of land produced by credit societies, the thematic maps attempted to legitimize the government’s accomplishments to a public audience.²¹⁴ In the process, thematic maps, better than any other source, sold a vision of the revolutionary state and nation as one and indivisible.

Conclusion

Statistics collectors and mapmakers in the two decades following the armed phase of the Mexican Revolution experienced both success and failure. For some, one failure seemed to be the continued lack of accurate data. As late as 1936, Fernando Foglio Miramontes lamented that Mexico was still “one of the countries most ignorant of itself.”²¹⁵ Moreover, many data collectors complained that campesinos especially did not seem willing to use statistics in their own production plans. In the 1930s, many officials worried that statistics remained “within the

reach of a small number of people.”²¹⁶ Numerous campesino communities rejected the state’s call to expand production on their lands.²¹⁷ In some ways, though, the most insurmountable problem of all for data collectors was out of their control. Federal, state and municipal governments never provided the resources necessary to collect the information desired.

Statistics collectors and mapmakers also experienced substantial success in achieving their stated goals. In the case of representing realities, while much of the data collected was inaccurate, notable exceptions existed.²¹⁸ And certainly the accuracy of the data improved over time. The more accurate data allowed the Mexican government to take great strides toward developing more national plans for economic reconstruction. The study *Sonora, Sinaloa y Nayarit*, for example, was just one part of a broader “program of economic development” coming into being by the late 1920s.²¹⁹ By the Cárdenas administration, such plans seemed truly possible and plausible, in part a result of the work of economic geographers in Hidalgo, Nayarit and elsewhere.²²⁰ In 1941, SAF officials boasted that “statistics is helping us in a very important way to know our country well, to assess our resources, and to indicate the directions in which to channel our activities for the development of the National Economy.”²²¹

The reconstruction policies not only extended the state’s domination over the land and its people, but they also helped to improve the conditions of many Mexicans’ lives. On the one hand, there can be little doubt that the standard of living for many Mexicans improved dramatically during the 1920s and 1930s. Most importantly, nearly half of all of Mexico’s land resided in the hands of poor campesinos by 1940. Moreover, cooperative and collective forms of production increased the output on much of that land. On the other hand, even these advances aided a broader project of state domination through the extension of capitalist relations of

production. As the literature on the Mexican Revolution will attest, the short-term benefits of workers and campesinos became longer-term victories for a new class of elites over time.

As a result, statistics' and maps' principal success in revolutionary Mexico lay in the service of nation-building. Data collectors believed that Mexicans had at least started to embrace their duties as Mexicans to provide the details of their lives to state officials. One report on the 1935 census, for example, claimed that because more people trusted officials to not abuse statistical privacy, "the quality of the data" had improved dramatically.²²² DEN officials rejoiced at the national unity promoted by data collection. Bojórquez elaborated the sentiment the best when he wrote of the 1930 census: "The prestige in the public mind obtained for the census, without distinction of creed nor class, was such that in a period of three months national opinion arrived at a level of cohesion without precedent."²²³ Another official later proclaimed that the 1935 census had proven "that a coordinated and harmonious effort between Governments and private citizens is possible, when dealing with a work of social utility."²²⁴

An analysis of the Mexican state's use of data collection to help build a nation adds to the scholarship on the role of statistics and maps in the relations between states and societies. First, because national identities were weakly shared by many Mexicans, the revolutionary state was forced to negotiate the very act of collecting data. Such a reality forces us to distinguish the *gathering* from the *use* of numbers. Second, the Mexican state used both the data-collection process and the statistics and maps that it produced to not only make society legible to the state, but also to make the state and nation legible to all Mexicans. By utilizing statistics and maps to expand a shared sense of national identity among Mexicans, data collectors also helped to conflate the revolutionary state and the nation in the popular mind.

The conflation of state and nation in Mexico depended upon policies of social reform. Prior to the Mexican Revolution, states and governments utilized maps and statistics in nation-building projects that ultimately failed. These failures stemmed, in part, from the inability to unite nation-building with programs of social reform informed and advanced by the collection and dissemination of statistics and maps. In this sense, one lesson of the Mexican Revolution lies in the state's capacity to solve a statistical and national dilemma. While building a strong and indivisible nation depended in part upon the collection of accurate data, the collection of accurate data depended upon the existence of strong and shared national identities. As the revolutionary state's commitment to social reform expanded, climaxing with the Cárdenas administration, the two goals became mutually reinforcing. Without statistics and maps, and their use to promote both expanded production and redistribution, the revolutionary nation-building project might have faltered just as those of previous governments before it.

¹ August Ludwig von Schlözer, quoted in Alain Desrosières, *The Politics of Large Numbers: A History of Statistical Reasoning*, trans. Camille Naish (Cambridge: Harvard University Press, 1998), 19. A different translation reads: "History is statistics in movement, statistics is stationary history." See Silvana Patriarca, *Numbers and Nationhood: Writing Statistics in Nineteenth-Century Italy* (Cambridge: Cambridge University Press, 1996), 8.

² Juan de Dios Bojórquez, "Organización de las Oficinas de Estadística," *Estadística Nacional* 2/43 (15 noviembre 1926), 3.

³ Theodore M. Porter, *The Rise of Statistical Thinking, 1820-1900* (Princeton: Princeton University Press, 1986), 11; Desrosières, *The Politics of Large Numbers*, 12; Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600* (Cambridge: Cambridge UP, 1997); I. Bernard Cohen, *The Triumph of Numbers: How Counting Shaped Modern Life* (New York: W.W. Norton and Company, 2005).

⁴ Norman J.W. Thrower, *Maps and Man: An Examination of Cartography in Relation to Culture and Civilization* (Englewood Cliffs, N.J.: Prentice-Hall, 1972), 4-5.

⁵ R.A. Skelton, *Maps: A Historical Survey of Their Study and Collecting* (Chicago: University of Chicago Press, 1972), 16; Porter, *The Rise of Statistical Thinking*.

⁶ J.B. Harley argues that "The history of the map is inextricably linked to the rise of the nation-state in the modern world." See J.B. Harley, *The New Nature of Maps: Essays in the History of Cartography* (Baltimore, MD:

Johns Hopkins University Press, 2001), 59. And while the first national census occurred in Sweden in 1749, the explosion of national censusing came with the American census in 1790 followed shortly by Great Britain in 1800-01. Dipesh Chakrabarty, for example, argues that “the systematic collection of statistics in detail and in specific categories for the purpose of ruling seems to be intimately tied to modern ideas of government.” Dipesh Chakrabarty, *Habitations of Modernity: Essays in the Wake of Subaltern Studies* (Chicago: University of Chicago Press, 2002), 84. See also Porter, *The Rise of Statistical Thinking*, 11; and Karl H. Metz, “Paupers and Numbers: The Statistical Argument for Social Reform in Britain during the Period of Industrialization,” in Lorenz Kruger, Lorraine J. Daston, and Michael Heidelberger, eds., *The Probabilistic Revolution*, vol.1, *Ideas in History* (Cambridge, MA: MIT Press, 1986), 337-50.

⁷ Peter Lewis, *Maps and Statistics* (New York: John Wiley and Sons, 1977), 13. See also G.C. Dickinson, *Statistical Mapping and the Presentation of Statistics*, 2nd ed. (London: Edward Arnold, 1973).

⁸ Norman J.W. Thrower, *Maps and Civilization: Cartography in Culture and Society*, 2nd ed. (Chicago: University of Chicago Press, 1999), 95. Thrower argued that the first half of the nineteenth century was “a period of rapid progress along a broad front in mapping, especially in thematic mapping” (125).

⁹ Thrower, *Maps and Civilization*, 150. For more on the interests of nineteenth-century thematic mapmakers, see Skelton, *Maps*, 22.

¹⁰ David J. Cuff and Mark T. Mattson, *Thematic Maps: Their Design and Production* (New York: Methuen, 1982), 1.

¹¹ Theodore M. Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton: Princeton University Press, 1995), 21. For more on the statistical bases of maps, see Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002). In reference to the quarter-century British effort to create a “great land map of Egypt,” Mitchell claimed that the map “was intended not just as an instrument of administrative control or geographical knowledge, but as a means of recording complex statistical information in a centralized, miniaturized, and visual form.” Mitchell, *Rule of Experts*, 9. For one more example, of statistics “aimed at mapping the distribution of people, resources and institutions on the national territory” in nineteenth-century Italy, see Patriarca, *Numbers and Nationhood*, 7.

¹² Metz, “Paupers and Numbers,” 339.

¹³ Jane Caplan and John Torpey, “Introduction,” in Jane Caplan and John Torpey, eds., *Documenting Individual Identity: The Development of State Practices in the Modern World* (Princeton: Princeton University Press, 2001), 1-11.

¹⁴ The kinds of statistics collected seem to have changed over time, especially during the nineteenth century. “Whereas the word ‘statistics’ in its (German) eighteenth-century sense denoted a general description of the states, in the nineteenth century it came to mean the numerical description of societies.” See Desrosières, *The Politics of Large Numbers*, 173.

¹⁵ For a description of the many resources represented by modern maps, see G.R. Crone, *Maps and Their Makers: An Introduction to the History of Cartography* (London: Hutchinson University Library, 1962), 128; Skelton, *Maps*, 16; and Thrower, *Maps and Man*, 1.

¹⁶ James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998), 3.

¹⁷ Karen Piper refers to states’ “fantasies of objectivity” when making maps. See Karen Piper, *Cartographic Fictions: Maps, Race, and Identity* (New Brunswick, NJ: Rutgers University Press, 2002), 13.

¹⁸ Jeremy Black, *Maps and Politics* (Chicago: University of Chicago Press, 1997), 18. See also Denis Wood, *The Power of Maps* (New York: Guilford Press, 1992).

¹⁹ Anthony Giddens, *The Contemporary Critique of Historical Materialism: Power, Property and the State* (London: Macmillan, 1981), 94. J.B. Harley includes maps in Giddens’s framework of authoritative resources. See Harley, *The New Nature of Maps*, 55.

²⁰ Porter, *Trust in Numbers*, 43.

²¹ Interestingly, he argues that herein lies one of the fundamental paradoxes of modern science. While making claims to “objectivity,” science also depends upon the use of its findings in action, and in fact the questions of scientists are sparked by and serve the interests of decisionmakers. See Desrosières, *The Politics of Large Numbers*, 6-7, 16. On the many policies impacted by statistics and maps, see Skelton, *Maps*, 16; Crone, *Maps and Their Makers*, 128; Porter, *The Rise of Statistical Thinking*, 18, 25; Thrower, *Maps and Man*, 21; J.H. Andrews, “Introduction: Meaning, Knowledge, and Power in the Map Philosophy of J.B. Harley,” in Harley, *The New Nature of Maps*, 22; Metz, “Paupers and Numbers,” 339-41.

²² Quoted in Metz, “Paupers and Numbers,” 343.

²³ Michel Foucault, "The Subject and the Power," in Hubert L. Dreyfus and Paul Rabinow, eds., *Michel Foucault: Beyond Structuralism and Hermeneutics, with an Afterword by Michel Foucault* (Brighton: Harvester, 1982), 208-26; and "Governmentality," in Graham Burchell, Colin Gordon, and Peter Miller, eds., *The Foucault Effect: Studies in Governmentality* (London: Harvester Wheatsheaf, 1991), 87-104.

²⁴ Chakrabarty, *Habitations of Modernity*, 84.

²⁵ Higgs, *The Information State in England: The Central Collection of Information on Citizens since 1500* (New York: Palgrave Macmillan, 2004), 7-8.

²⁶ Metz, "Paupers and Numbers," 337-50.

²⁷ Porter, *The Rise of Statistical Thinking*, 27-28.

²⁸ Desrosières, *The Politics of Large Numbers*, 182.

²⁹ Desrosières, *The Politics of Large Numbers*, 189. For more on the results and meanings of census procedures, see Margo J. Anderson and Stephen E. Fienberg, *Who Counts? The Politics of Census-Taking in Contemporary America* (New York: Russell Sage Foundation, 1999). For a detailed account of the history of the American census over time, see Margo J. Anderson, *The American Census: A Social History* (New Haven: Yale University Press, 1988). For a similar discussion beyond the U.S. experience, see Chakrabarty, *Habitations of Modernity*, 86-90; and Higgs, *The Information State*.

³⁰ Porter, *The Rise of Statistical Thinking*, 23; Andrews, "Introduction," 24.

³¹ Jerry Brotton, *Trading Territories: Mapping the Early Modern World* (Ithaca, NY: Cornell University Press, 1998).

³² Skelton, *Maps*, 16; Crone, *Maps and Their Makers*, 128; Thrower, *Maps and Man*, 21.

³³ Quoted in Thongchai Winichakul, *Siam Mapped: A History of the Geo-Body of a Nation* (Honolulu: University of Hawaii Press, 1994), 14.

³⁴ Talal Asad, "Ethnographic Representation, Statistics, and Modern Power," *Social Research* 61/1 (Spring 1994).

³⁵ Sean Redding, "Government Witchcraft: Taxation, the Supernatural, and the Mpondo Revolt in the Transkei, South Africa, 1955-1963," *African Affairs* 95/381 (Oct. 1996).

³⁶ Chakrabarty, *Habitations of Modernity*, 83-84. For another case of colonialism, see Mitchell, *Rule of Experts*. This drive to dominate territory through maps and statistics is related to its opposite: to know and represent what is not yet known. According to Karen Piper, early modern maps constantly represented the unknown as something to be feared; see Piper, *Cartographic Fictions*, 6.

³⁷ Porter, *Trust in Numbers*, 77.

³⁸ Patriarca, *Numbers and Nationhood*, 7.

³⁹ Roger J.P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Property Mapping* (Chicago: University of Chicago Press, 1992). The authors stress the many functions/uses of cadastral maps, including land reclamation, evaluation/management of land resources, and colonial settlement, among others.

⁴⁰ Harley, *The New Nature of Maps*, 55. For a nice discussion of the relevance of Foucault's work to geography and maps, see Benjamin S. Orlove, "Mapping Reeds and Reading Maps: The Politics of Representation in Lake Titicaca," *American Ethnologist* 18/1 (February 1991), 3-38.

⁴¹ Harley, *The New Nature of Maps*, 79.

⁴² Philip Corrigan and Derek Sayer, *The Great Arch: English State Formation as Cultural Revolution* (Oxford: Blackwell, 1985). See also Doug Aberley, "The Lure of Mapping: An Introduction," in Aberley, ed., *Boundaries of Home: Mapping for Local Empowerment* (Gabriola Island, BC: New Society Publishers, 1993); and Matthew Edney, "Mathematical Cosmography and the Social Ideology of British Cartography, 1780-1820," *Imago Mundi* 46 (1994).

⁴³ Piper, *Cartographic Fictions*.

⁴⁴ Winichakul, *Siam Mapped*, 61. Piper extends this notion globally; see Piper, *Cartographic Fictions*.

⁴⁵ It should be noted that statistics and maps are not merely negotiations between states and societies. Jerry Brotton argues that early modern maps, for example, could be viewed as negotiations, or claims, between rival royal powers over territory; see Brotton, *Trading Territories*. Moreover, Norman Thrower has demonstrated how the race to map unknown territories became an arena through which national rivalries emerged. See Thrower, *Maps and Civilization*, 155.

⁴⁶ Porter, *Trust in Numbers*, 41.

⁴⁷ Readings of the bible indicated to some that King David's census led to God's punishment in the form of a plague; see Cohen, *The Triumph of Numbers*, 28-33. See also the comments of Representative Thornton, Member

of Parliament for York, who in 1753 rejected the effort to carry out a national census, which he found “to be totally subversive of the last remnants of English liberty.” See Dickinson, *Statistical Mapping*, 9.

⁴⁸ Not just census categories, but all kinds of statistical measures have been negotiated. See, for example, U.S. discussions surrounding the definitions of “unemployed” during the Great Depression. Desrosières, *The Politics of Large Numbers*, 199-209.

⁴⁹ Desrosières, *The Politics of Large Numbers*, 189.

⁵⁰ Higgs, *The Information State*, 20. Porter argues that “national identity...may be formed in part through the articulation of public statistics.” See Porter, *Trust in Numbers*, 42. Among the many other examples, see Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso/New Left Books, 1983); Bruce Curtis, *The Politics of Population: State Formation, Statistics, and the Census of Canada, 1840-1875* (Toronto: University of Toronto Press, 2001); Michel Foucault, “Governmentality”; Patriarca, *Numbers and Nationhood*; Jean-Claude Perrot and Stuart J. Woolf, *State and Statistics in France, 1789-1815* (New York: Harwood Academic Publishers, 1984); and Jacques Revel, “Knowledge of the Territory,” *Science in Context* 4 (1991), 133-62. Chakrabarty notes that in addition to national identities, so, too, are local identities formed through the elaboration of census categories; Chakrabarty, *Habitations of Modernity*, 86-90.

⁵¹ Patriarca, *Numbers and Nationhood*, 6-7.

⁵² Winichakul, *Siam Mapped*, x, 174.

⁵³ Desrosières, *The Politics of Large Numbers*, 178-86.

⁵⁴ Winichakul, *Siam Mapped*, 4.

⁵⁵ For a third case, that of Italy, see Patriarca, *Numbers and Nationhood*.

⁵⁶ Víctor Manuel Ruiz Naufal, “La faz del terruño. Planos locales y regionales, siglos XVI-XVIII,” in Héctor Mendoza Vargas, coord., *México a través de los mapas* (México: Plaza y Valdés, 2000), 34. See also “Resumen histórico de la estadística en México,” speech by Jesús S. Soto to Primera Reunión Nacional de Estadística, *Estadística Nacional* 3/55 (15 mayo 1927), 1-10.

⁵⁷ David Buisseret, “Presentación,” in Mendoza Vargas, coord., *México a través*, 11.

⁵⁸ Quoted in Michel Antochiw, “La visión total de la Nueva España. Los mapas generales del siglo XVIII,” in Mendoza Vargas, coord., *México a través*, 73.

⁵⁹ For a nice summary of nineteenth-century statistics collection in Mexico, see “La evolución de la estadística en México,” *Estadística Nacional* 3/47 (15 enero 1927), 1-5. For more, see 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* (México: El Colegio de México, 1999).

⁶⁰ Mendoza Vargas, “Las opciones geográficas al inicio del México independiente,” in Mendoza Vargas, coord., *México a través*, 93.

⁶¹ Secretaría de la Economía Nacional [SEN], Dirección General de Estadística [DGE], *Memoria de la III Reunión Nacional de Estadística* (México, 1941), 20. Interestingly, Mexico created the SMGE precisely at the time when Europeans were establishing separate societies for geography and statistics. In Great Britain, for example, the Royal Geographical Society was established in 1831, followed three years later by the Statistical Society of London (renamed the Royal Statistical Society in 1887). Similar patterns occurred in France, Germany and elsewhere.

⁶² Thrower, *Maps and Civilization*, 9.

⁶³ Ruiz Naufal, “La faz del terruño,” 38.

⁶⁴ Mendoza Vargas, “Las opciones geográficas,” 100-01.

⁶⁵ Mayer Celis, *Entre el infierno*, 86, 13-15, 27.

⁶⁶ Raymond B. Craib, *Cartographic Mexico: A History of State Fixations and Fugitive Landscapes* (Durham: Duke University Press, 2004), 9, 20, 50. For more on the process of measuring the boundary between the U.S. and Mexico following the war, see Paula Rebert, *La Gran Línea: Mapping the United States-Mexico Boundary, 1849-1857* (Austin: University of Texas Press, 2001).

⁶⁷ Quoted in Craib, *Cartographic Mexico*, 127.

⁶⁸ For more on the Geographic-Exploration Commission and the Ley Lerdo, see Craib, *Cartographic Mexico*. For more on the role of mapmakers in advancing a Liberal economic project see Mendoza Vargas, “Las opciones geográficas,” 107-10.

⁶⁹ For more on that process, see Robert H. Holden, *Mexico and the Survey of Public Lands: The Management of Modernization, 1876-1911* (DeKalb, IL: Northern Illinois University Press, 1994).

⁷⁰ Craib, *Cartographic Mexico*, 175.

⁷¹ See especially “The Mexican Central Railway, 1890,” a map analyzed and appearing in Thrower, *Maps and Civilization*, 141-43.

⁷² Minister of Development Olegario Molina supported data collection before the civil war; see Secretaría de Fomento [SF], “Estadística Agrícola. Razones que determinan la naturaleza de los datos más urgentes para fundamento de la política agraria e instrucciones sobre la manera de reunir los datos,” (México: SF, 1910), Colección Marte R. Gómez, Biblioteca del Colegio de Postgraduados [hereafter CMRG]. For more on statistics and Porfirian economic policy, see María Cecilia Zuleta, “La invención de una agricultura próspera. Itinerarios del fomento agrícola entre el porfiriato y la revolución,” (Ph.D. Dissertation: El Colegio de México, 2000).

⁷³ Craib, *Cartographic Mexico*, 93, 146-48.

⁷⁴ Mendoza Vargas, “Los mapas y el siglo XX mexicano,” in Mendoza Vargas, coord., *México a través*, 166.

⁷⁵ Mendoza Vargas, “Los mapas,” 178.

⁷⁶ Craib, *Cartographic Mexico*.

⁷⁷ *México—Atlas. Estados, Dist. Federal, Territorias* (México: M. Guillot, 1921 [1913]), IV.

⁷⁸ Lic. I. Urquijo, “Conveniencia de establecer cursos especiales de Estadística en el Departamento de la Estadística Nacional,” *Boletín del Departamento de la Estadística Nacional* 2/1/1-2 (July-August 1923), 19.

⁷⁹ “La exposición estadística,” *Estadística Nacional* 2/45 (15 diciembre 1926), 3; “Reconstrucción nacional y reorganización estadística,” *Estadística Nacional* 3/51 (15 marzo 1927), 2. For similar comments, see “Caracteres y relaciones de la Estadística,” *Estadística Nacional* 2/44 (30 noviembre 1926), 3.

⁸⁰ Bojórquez, “Momento decisivo para el gremio agronómico,” 31 October 1922, in CMRG, “Trabajos presentados al Segundo Congreso Nacional Agronómico 1922,” 5.

⁸¹ Secretaría de Agricultura y Fomento [SAF], Dirección de Estudios Geográficos y Climatológicos [DEGC], *Atlas geográfico de la República Mexicana* (México, 1921).

⁸² Ing. Mario Javier Hoyo, “Consideraciones sobre el funcionamiento del cuerpo de agrónomos regionales,” September 1922, in CMRG, “Trabajos Presentados,” 1. For more on extension agents’ continued role in data collection, see “Como formular el programa de extensión,” *Extensión Agrícola* 1 (febrero 1933), I-II.

⁸³ During the Maximato, the DEE would be split into an Office of Rural Economy (headed by Gonzalo González) and a Department of Statistics (headed by Ramón Fernández y Fernández).

⁸⁴ Slogan on back page of *Estadística Nacional* 2/29 (15 marzo 1926).

⁸⁵ See the slogan inside front cover of *Estadística Nacional* 1/1 (15 enero 1925); and “Divulgación de los resultados estadísticos,” *Estadística Nacional* 3/49 (15 febrero 1927), 1.

⁸⁶ Ramón Fernández y Fernández, “La estadística matemática,” *Crisol* 5/9/49 (31 enero 1933), 9-11. This was an essential change between Porfirian and revolutionary periods. María Cecilia Zuleta argues that Porfirian policymakers could never quite make the shift from using economic policy to protect already existent economic interests to promoting wholly new activities. See Zuleta, “La invención de una agricultura próspera.”

⁸⁷ “La pluralidad de oficinas de estadística,” *Estadística Nacional* 1/11 (15 junio 1925), 1.

⁸⁸ Ramón Corral Soto, “Algunas indicaciones al problema agrario,” September 1922, in CMRG, “Trabajos presentados,” CMRG, 1-2.

⁸⁹ Hoyo, “Consideraciones,” 2, 3-6.

⁹⁰ Bojórquez, “Momento decisivo,” 5.

⁹¹ “Manual de estadística para uso de los empleados de la Estadística Nacional, formulado por el Licenciado Francisco de A. Benavides, Jefe de la Oficina de Producción, Distribución y Consumo,” *Boletín del Departamento de la Estadística Nacional* 2/1/4-6 (October-December 1923), 75. For a similar argument, see “La estadística agrícola. Una excitativa a los agricultores,” *Boletín del Departamento de la Estadística Nacional* 2/1/4-6 (October-December 1923), 71-2.

⁹² Ramón E. Monroy, “El problema agrario en el Estado de México,” 15 November 1922, in CMRG, “Trabajos presentados,” 1, 2, 4. For more information, see Sociedad Agronómica Nacional, “Acta Constitutiva y Estatutos de la Sociedad Agronómica Nacional,” (México: Linotip. Artística, 1921), CMRG.

⁹³ “Caracteres y relaciones de la Estadística,” *Estadística Nacional* 2/44 (30 noviembre 1926), 3; “Reconstrucción nacional y reorganización estadística,” *Estadística Nacional* 3/51 (15 marzo 1927), 1.

⁹⁴ México, SEN, DGE, *Memoria de los censos de 1935. Primer censo ejidal, Segundo censo industrial* (México, 1936), 35.

⁹⁵ “Consideraciones sobre estadística social,” speech by Adolfo Ruiz Cortines at the Primera Reunión Nacional de Estadística, *Estadística Nacional* 3/62 (31 agosto 1927), 1.

⁹⁶ Lic. I. Urquijo, “Conveniencia de establecer cursos especiales de Estadística en el Departamento de la Estadística Nacional,” *Boletín del Departamento de la Estadística Nacional* 2/1/1-2 (July-August 1923), 19.

⁹⁷ “La nueva organización estadística de México,” *Estadística Nacional* 2/46 (31 diciembre 1926), 1.

- ⁹⁸ México—*Atlas. Estados, Dist. Federal, Territorias* (México: M. Guillot, 1921 [1913]), IV.
- ⁹⁹ SAF, DEGC, *Atlas geográfico*. Sánchez continued his work throughout the 1920s. See, for example, SAF, DEGC, *Catálogo de datos numéricos, geográficos y topográficos de la República Mexicana* (México: SAF, 1927).
- ¹⁰⁰ “Proyecto de reorganización de los trabajos de la Dirección de Demografía,” *Boletín del Departamento de la Estadística Nacional* 2/1/1-2 (July-August 1923), 11.
- ¹⁰¹ “La pluralidad de oficinas de estadística,” *Estadística Nacional* 1/11 (15 junio 1925), 2.
- ¹⁰² “Instalación del Consejo Nacional de Estadística,” *Estadística Nacional* 4/71 (septiembre 1928), 2.
- ¹⁰³ “Instalación del Consejo Nacional de Estadística,” *Estadística Nacional* 4/71 (septiembre 1928), 2.
- ¹⁰⁴ Porter, *Trust in Numbers*, 44.
- ¹⁰⁵ SEN, DGE, *Medidas Regionales. Censo Agrícola Ganadero de 1930* (México, 1933), BMRG.
- ¹⁰⁶ “Vocabulario Agrícola Nacional, recopilado directamente por agentes del Censo de la Dirección General de Estadística y aumentado y reorganizado por el Instituto Mexicano de Investigaciones Lingüísticas que lo publica con autorización de la mencionada dirección,” *Investigaciones Lingüísticas* 3/3-4 (mayo-agosto 1935), 4, 7, 9-62.
- ¹⁰⁷ “La estadística como elemento de cultura,” *Boletín del Departamento de la Estadística Nacional* 2/2/2 (agosto de 1924), 21.
- ¹⁰⁸ “Educación para la Estadística y Estadística para la Educación,” *Estadística Nacional* 2/42 (31 octubre 1926), 1.
- ¹⁰⁹ “La elaboración del Censo Agrícola-Ganadero,” *Estadística Nacional* 7/102 (abril 1931), 153.
- ¹¹⁰ Fernando Sánchez Ríos to Carlos Ayala Origel, 4 April 1927, Archivo General de la Nación, Grupo Documental 215, Secretaría de Agricultura y Recursos Hidráulicos (hereafter AGN-SAF) 1/12-A-169-1: Carlos Ayala Origel, 3.
- ¹¹¹ Marte R. Gómez, *Las comisiones agrarias del sur* (México, 1982), 51.
- ¹¹² Andrés Escalante Enríquez, “Estudio Agrícola de la Región de Champusco,” Escuela Nacional de Agricultura [ENA] Thesis (May 1930), Biblioteca de la Universidad Autónoma de Chapingo [BCh], 1.
- ¹¹³ *Sonora, Sinaloa y Nayarit. Estudio estadístico y económico social elaborado por el Departamento de la Estadística Nacional. Año de 1927* (México: Imprenta Mundial, 1928), 130.
- ¹¹⁴ “La elaboración del Censo Agrícola-Ganadero,” *Estadística Nacional* 7/102 (abril 1931), 153.
- ¹¹⁵ “Breves comentarios a la ley por la cual fué creado el Departamento de la Estadística Nacional,” *Boletín del Departamento de la Estadística Nacional*, 2/1/1-2 (julio y agosto 1923), 76; and *Sonora, Sinaloa y Nayarit*, 130.
- ¹¹⁶ Manuel Alcázar to Segundo Iturríoz, 30 April 1927, AGN-SAF 1/12A-48-1: Manuel Alcázar, 1.
- ¹¹⁷ Gómez, *Comisiones agrarias*, 52-6.
- ¹¹⁸ For the details of this case, see Gómez, *Comisiones agrarias*, 55-6.
- ¹¹⁹ In Morelos, the residents of Cuachichinola destroyed the property markers of Puente de Ixtla ejido orchards, forcing agronomists to reestablish boundaries. See “Informe Complementario...de Puente de Ixtla del Estado de Morelos...,” 11 July 1922, Archivo Marte R. Gómez [AMRG], “Trabajos de la Dirección Auxiliar de la Comisión Nacional Agraria-1922,” 2. In Xoxocotla, Veracruz, Manuel Mesa, too, had to intercede in a case of boundary disputes that threatened violence. See Mesa to Marte Gómez, 20 June 1925, AMRG, 1925 Cartas, 2. He complained of similar inter-village disputes elsewhere in the state; Mesa to Gómez, 25 June 1925. In Hidalgo, Manuel Cabada negotiated a deal between the Jaguey and Santa María Amealco ejidatarios over rights to waters and pastures. Santa María residents finally agreed to rent the pasturelands from Jaguey, and violence was avoided. See Miguel Cabada to Mariano Cervantes, 6 May 1927 and 11 June 1927, AGN-SAF 3/12C-10-2: Miguel Cabada, 1.
- ¹²⁰ “El Sindicato de Agricultores de Puebla ha presentado una queja al Gobernador,” *Excelsior* (5 July 1922), Section 2, 6-7.
- ¹²¹ Francisco Pérez Sierra to Gómez, 6 July 1925, AMRG, 1925 Cartas, 2.
- ¹²² Abel Hernández Coronado to Gómez, 21 May 1926, AMRG, 1926 Cartas, 1-2.
- ¹²³ Luis L. León to Fernando Torreblanca, 31 March 1925, AGN, Grupo Documental 182, Ramo Presidencial Obregón-Calles (hereafter AGN-O/C), 339/818-A-91.
- ¹²⁴ The CLA agronomists remained undeterred. Jorge Rodríguez Moguel replaced Laureles and continued the fight against the powerful Aguirre clan in the years ahead. For more on the Laureles murder, see Gómez, *Biografías de agrónomos* (Chapingo: Colegio de Postgraduados, 1976), 450; and *Germinal* 2/2 (31 August 1923), 5.
- ¹²⁵ See Alvaro Obregón, CNA Acuerdo, 28 August 1924, and SAF Acuerdo, 11 September 1924, AGN-O/C, 50/121-A-G-23.

¹²⁶ See Ervin, "Agronomists, Revolution and Reconstruction," in *México en movimiento*, 45-7. For one more case of an agronomist dying in the line of duty, see Obregón CNA Acuerdo, 28 August 1924, AGN-O/C, 109/242-C1-R-5, regarding the stipend paid to the family of the fallen Alfredo Rivera.

¹²⁷ Lauro Caloca, "La Comisión Nacional Agraria debe ser elevada a la categoría de Ministerio," in CMRG, "Trabajos presentados," 1, 4.

¹²⁸ Gómez, *Biografías*, 129.

¹²⁹ "Dirección General de Estadística," *Boletín oficial de la Secretaría de Agricultura y Fomento* 3/4/2 (febrero 1918), 81; "Dirección General de Estadística," *Boletín oficial de la Secretaría de Agricultura y Fomento* 3/4/8 (agosto 1918), 473-4.

¹³⁰ "Proyecto de reorganización de los trabajos de la Dirección de Demografía," *Boletín del Departamento de la Estadística Nacional* 2/1/1-2 (July-August 1923), 11.

¹³¹ "Los documentos de recolección," speech by Angel Batis at the Primera Reunión Nacional de Estadística, *Estadística Nacional* 3/61 (15 agosto 1927), 2.

¹³² SAF, DEGC, *Atlas geográfico*, 2.

¹³³ "Los documentos de recolección," *Estadística Nacional* 3/61 (15 agosto 1927), 1.

¹³⁴ Bojórquez, "Momento decisivo," 5.

¹³⁵ "Número de empleados que deben integrar las Secciones de Estadística de las entidades," *Estadística Nacional* 3/54 (30 abril 1927), 6.

¹³⁶ See Michael A. Ervin, "The 1930 Agrarian Census in Mexico."

¹³⁷ "Los documentos de recolección," *Estadística Nacional* 3/61 (15 agosto 1927), 2.

¹³⁸ Gonzalo Robles, "Educación agrícola. Propaganda," AGN, Grupo Documental 248: Gonzalo Robles [AGN-GR] 49/24, 4.

¹³⁹ Bojórquez, "Orientaciones de la Estadística en México. Conferencia sustentada en la Sociedad Mexicana de Geografía y Estadística, el 14 de mayo de 1929," 18, 17.

¹⁴⁰ "Dirección General de Estadística," *Boletín oficial de la Secretaría de Agricultura y Fomento* 3/4/8 (agosto 1918), 473-74.

¹⁴¹ Juan Ballesteros, "Los Censos de 1930," May 1930, AGN-GR 5/68, P.1930-18, 1. For the report on municipal name changes, see "División territorial de la República," *Estadística Nacional* 3/60 (30 julio 1927), 5-9.

¹⁴² México, SEN, DGE, *México en cifras (Atlas Estadístico)*, 1934 (México, no date [1934]), 1.

¹⁴³ "Organización y funciones del Departamento de la Estadística Nacional," *Estadística Nacional* 3/52 (30 marzo 1927), 3.

¹⁴⁴ "Primera Reunión Nacional de Estadística. La Primera Reunión Nacional de Estadística votó las siguientes resoluciones," *Estadística Nacional* 3/54 (30 abril 1927), 4.

¹⁴⁵ "Los resultados de la Primera Reunión Nacional de Estadística," *Estadística Nacional* 4/65 (marzo 1928), 1-2. "Instalación del Consejo Nacional de Estadística," *Estadística Nacional* 4/71 (septiembre 1928), 1-3.

¹⁴⁶ For early calls for the need for a new ministry, see Froylán C. Manjarrez, "Fundamentos para la creación de un ministerio de Economía Nacional," *Crisol* 1/2/7 (julio 1929), 32-42.

¹⁴⁷ Gonzalo González H., "La coordinación estadística," *Revista de Economía y Estadística* 4/37 (mayo 1936), 32-3. González directed the office under Cárdenas.

¹⁴⁸ In 1923, Abel Hernández Coronado and other CNA employees complained of a SAF bureaucracy "whose organization and functioning had been modified little with respect to revolutionary ideas." See "La Comisión Nacional Agraria como cuerpo técnico y administrativo," *Germinal* 2/2 (31 August 1923), 6; and Hernández Coronado, "Lo que cuesta y ha hecho la Comisión Nacional Agraria," in CMRG, "Trabajos presentados," 2.

¹⁴⁹ Caloca, "La Comisión Nacional Agraria," 1, 4.

¹⁵⁰ "El trabajo del equipo electro-mecánico 'Powers' en el año de 1925," *Estadística Nacional* 2/28 (28 febrero 1926), 1-2.

¹⁵¹ "Educación para la Estadística y Estadística para la Educación," *Estadística Nacional* 2/42 (31 octubre 1926), 1.

¹⁵² "La encuesta y la estadística," *Estadística Nacional* 5/80 (junio 1929), 1.

¹⁵³ "Como formular el programa de extensión," *Extensión Agrícola* 1 (febrero 1933), I.

¹⁵⁴ México, SEN, DGE, *Memoria de los censos de 1935*, 27.

¹⁵⁵ SEN, DGE, *Memoria de la III Reunión Nacional de Estadística*, 6.

¹⁵⁶ "Primera Reunión Nacional de Estadística. La Primera Reunión Nacional de Estadística votó las siguientes resoluciones," *Estadística Nacional* 3/54 (30 abril 1927), 4.

¹⁵⁷ “Los resultados de la Primera Reunión Nacional de Estadística,” *Estadística Nacional* 4/65 (marzo 1928), 1-2. On the 1917 law, see “Dirección General de Estadística,” *Boletín oficial de la Secretaría de Agricultura y Fomento* 3/4/8 (agosto 1918), 473.

¹⁵⁸ “Primera Reunión Nacional de Estadística. Discurso que el C. Ing. Juan de Dios Bojórquez, leyó en la sesión inaugural,” *Estadística Nacional* 3/54 (30 abril 1927), 3.

¹⁵⁹ Ervin, “The 1930 Agrarian Census in Mexico.”

¹⁶⁰ See slogan inside from cover of *Estadística Nacional* 1/1 (15 enero 1925).

¹⁶¹ “La estadística agrícola. Una excitativa a los agricultores,” *Boletín del Departamento de la Estadística Nacional* 2/1/4-6 (October-December 1923), 72.

¹⁶² “Los resultados de la Primera Reunión Nacional de Estadística,” *Estadística Nacional* 4/65 (marzo 1928), 2.

¹⁶³ México, *Memoria que el C. Ing. Juan de D. Bojórquez, Jefe del Departamento de la Estadística Nacional, somete a la consideración del H. Congreso de la Unión, acerca de los trabajos realizados en el Ramo de Estadística, del 1o. de agosto de 1926 al 31 de julio de 1927* (México, 1927), 49.

¹⁶⁴ SEN, DGE, *Memoria de la III Reunión Nacional de Estadística*, 4.

¹⁶⁵ “Educación para la Estadística y Estadística para la Educación,” *Estadística Nacional* 2/42 (31 octubre 1926), 1.

¹⁶⁶ See inside cover, *Estadística Nacional* 8/112 (febrero 1932) announcing essay and graphics contest for Tercera Reunión Nacional de Estadística.

¹⁶⁷ SAF, DEGC, *Catálogo*.

¹⁶⁸ See “Mapa de la división por zonas de las aguas federales,” *Boletín de la Estadística Nacional* 2/2/5 (noviembre 1924): 47.

¹⁶⁹ Ballesteros, “Los Censos de 1930,” May 1930, AGN-GR 5/68, P.1930-18, 1.

¹⁷⁰ México, SEN, DGE, *México en cifras*, 1.

¹⁷¹ For the three mentioned states, see Ing. Leandro E. Mendoza Vargas, “Informe general sobre el estado de Chihuahua,” 24 July 1922; Gómez, “Estudio sobre las condiciones sociales agrícolas y económicas del estado de Morelos y programa general para su reconstrucción,” 30 August 1922; and Ing. José Mares, “Lijeros apuntes sobre la agricultura en Yucatán,” 6 June 1922, in CMRG, “Trabajos Presentados.” For other cases, see SAF, *Perspectivas para las explotaciones agrícolas-ganaderas en el Distrito Federal* (México: Talleres Gráficas de la Nación, 1925); SAF, Dirección de Agricultura y Ganadería, *El problema agrario en el Estado de Hidalgo. Inauguración de la Escuela Central Agrícola de Hidalgo* (México: DEGC, 1926); Comisión Nacional de Irrigación. *Estudio agrícola del proyecto de riego de Sta. Gertrudis, Tamps.* (México, 1930); and Ing. Pastor Rouaix, *Geografía del Estado de Durango* (México: SAF, 1929).

¹⁷² René A. Becerra, “El levantamiento de la Carta Agrológica del Estado de Morelos (Fracción del Valle de Cuautla Morelos),” ENA Thesis (April 1930), BCh, 4.

¹⁷³ Carlos Terrazas Moro, “Geografía agrícola. El estado de Chihuahua y sus riquezas naturales,” *Germinal* 1/4 (15 marzo 1925), 16-17.

¹⁷⁴ See Ing. Gaspar Garza Lara, “La agricultura en la región lagunera,” 30 October 1922, in CMRG, “Trabajos presentados”; and *Informe general de la Comisión de Estudios de la Comarca Lagunera* (México: Editorial Cultura, 1930).

¹⁷⁵ Gómez, open letter to ENA students (first page missing), AMRG, “ENA 1923-1944,” 4.

¹⁷⁶ “Estado actual del servicio de Agrónomos Regionales,” 20 March 1924, AGN-GR 10/93, 3. See also “Organización actual del servicio de agrónomos regionales,” 20 March 1924, AGN-GR 10/93; SAF, Dirección General de Agricultura y Ganadería, *Memoria de los trabajos ejecutados por las Direcciones de Agricultura y Ganadería e Instituto Biotécnico del año de 1935 a mayo de 1940 y dentro del período presidencial del C. Gral. de División Lázaro Cárdenas* (México, sin fecha), 18.

¹⁷⁷ See SAF, *Boletín mensual. Organó de la Oficina para la Defensa Agrícola* for more.

¹⁷⁸ “Censo Agrícola Ganadero de 1930,” *Revista de Economía y Estadística* 1/7 (noviembre 1933), 48. The divisions were as follows: North (Coahuila, Chihuahua, Durango, Nuevo León, San Luis Potosí, Tamaulipas, Zacatecas); Gulf (Campeche, Quintana Roo, Tabasco, Veracruz, Yucatán); Pacific North (Baja California, Nayarit, Sinaloa, Sonora); Pacific South (Colima, Chiapas, Guerrero, Oaxaca); and Center (Aguascalientes, Distrito Federal, Guanajuato, Hidalgo, Jalisco, México, Michoacán, Morelos, Puebla, Querétaro, Tlaxcala). See, for example, DEN, “Censos 15 de Mayo de 1930,” 6 March 1930, AGN-GR 5/68, P.1930-13. This card from DEN’s Office of Information and Press lists livestock production from 1926. See also the DEN appendix provided in Alejandro Arellano Belloc, “Cultivo del cocotero y algunos datos sobre su beneficio,” ENA Thesis (1932), BCh, 57; and

“Cosecha de Maíz en 1927. Estimación Preliminar” and “Cosecha de Frijol en 1927. Estimación Preliminar,” *Estadística Nacional* 4/65 (marzo 1928), 30-1.

¹⁷⁹ *Sonora, Sinaloa y Nayarit*.

¹⁸⁰ Ramón Fernández y Fernández, “Principales cultivos de la República Mexicana,” *Agricultura* 1/2 (abril-mayo 1934), 117-18.

¹⁸¹ Fernando Foglio Miramontes, *Geografía económica agrícola del Estado de Michoacán*, 4 vols. (México: Cámara de Diputados, 1936); SEN, DEE, Sector de Geografía Económica, *Geografía económica del Estado de Hidalgo* (México: DAPP, 1939); and SEN, DEE, Sector de Geografía Económica, *Geografía económica del Estado de Nayarit* (México: DAPP, 1939).

¹⁸² González H., “La coordinación estadística,” *Revista de Economía y Estadística* 4/37 (mayo 1936), 35.

¹⁸³ *Sonora, Sinaloa y Nayarit*, 13.

¹⁸⁴ México, *Memoria que el C. Ing. Juan de D. Bojórquez*, 26-7.

¹⁸⁵ Foglio Miramontes, *Geografía económica agrícola del Estado de Michoacán*, vol.1, vii.

¹⁸⁶ For the categories of statistics and the new organization, see “Organización de las Oficinas de Estadística,” *Estadística Nacional* 2/43 (15 noviembre 1926), 3; “La nueva organización estadística de México,” *Estadística Nacional* 2/46 (31 diciembre 1926), 2; and “Organización y funciones del Departamento de la Estadística Nacional,” *Estadística Nacional* 3/52 (30 marzo 1927).

¹⁸⁷ México, SEN, DGE, *México en cifras*, 1.

¹⁸⁸ “La nomenclatura nacional de ocupaciones,” *Estadística Nacional* 7/108 (octubre 1931), 417-40.

¹⁸⁹ “Vocabulario Agrícola Nacional,” *Investigaciones Lingüísticas* 3/3-4 (mayo-agosto 1935), 3.

¹⁹⁰ “Nuestras sinonimias populares de las enfermedades,” *Estadística Nacional* 7/106 (agosto 1931), 333-4.

¹⁹¹ SEN, DGE, *Medidas Regionales*.

¹⁹² México, SEN, DGE, *Memoria de los censos de 1935*.

¹⁹³ “Los censos y el sistema métrico decimal. Abandone las medidas anticuadas,” (México, 1939). The quote appears on page 10.

¹⁹⁴ *Sonora, Sinaloa y Nayarit*, 138-39.

¹⁹⁵ See Ervin, “The 1930 Agrarian Census in Mexico” for more information.

¹⁹⁶ See especially Cuadro 282, “Ejidios censados en el estado de Michoacán, el 10 de abril de 1935,” in Foglio Miramontes, *Geografía económica agrícola del Estado de Michoacán*, vol.III, 228, 235-36.

¹⁹⁷ For an example of these instructions to agents in the field, see “Programa de trabajos para el regional del Estado de México,” 6 October 1925, AGN-SAF 3/12C-113-1: Adrián Cordero, 1-2.

¹⁹⁸ “Organización actual del servicio de agrónomos regionales,” 20 March 1924, AGN-GR 10/93, 1-2.

¹⁹⁹ “Estadística popular. La divulgación de las ideas estadísticas,” *Estadística Nacional* 3/50 (28 febrero 1927), 3.

²⁰⁰ See the slogan on back page of *Estadística Nacional* 2/29 (15 marzo 1926).

²⁰¹ Untitled, *Estadística Nacional* 1/1 (15 enero 1925), 1.

²⁰² “Educación para la Estadística y Estadística para la Educación,” *Estadística Nacional* 2/42 (31 octubre 1926), 1.

²⁰³ “La exposición estadística,” *Estadística Nacional* 3/45 (15 diciembre 1926), 1. Bojórquez author.

²⁰⁴ “Estadística gráfica,” *Boletín del Departamento de la Estadística Nacional* 2/1/4-6 (October-December 1923), 10.

²⁰⁵ Fernández y Fernández, “Los indicios generales de la exportación,” *Crisol* 5/9/50 (28 febrero 1933), 73-75.

²⁰⁶ “Educación para la Estadística y Estadística para la Educación,” *Estadística Nacional* 2/42 (31 octubre 1926), 1. “La exposición estadística,” *Estadística Nacional* 3/45 (15 diciembre 1926), 1.

²⁰⁷ “Estadística Popular. La divulgación de las ideas Estadísticas,” *Estadística Nacional* 3/50 (28 febrero 1927), 3.

²⁰⁸ “Educación para la Estadística y Estadística para la Educación,” *Estadística Nacional* 2/42 (31 octubre 1926), 1.

²⁰⁹ México, SEN, DGE, *México en cifras*, 1-2.

²¹⁰ See “Juntas de Defensa Agrícola organizadas hasta el 31 de diciembre de 1927,” in SAF, *Boletín Mensual. Organó de la Oficina para la Defensa Agrícola* 2/1/1-3 (January-March 1928), 69.

²¹¹ See “Localización de las Escuelas Normales Rurales y Centrales Agrícolas,” in Dirección de Misiones Culturales, “Educación Campesina y Fomento Rural, Proyecto de la Escuela Regional,” AGN-GR 49/25, México, sin fecha.

²¹² The quotes come from the Director General de Estadística, Fernando Foglio Miramontes. See “Introducción,” in SEN, DGE, *La reforma agraria en México* (México: Departamento Autónomo de Publicidad y Propaganda, 1937).

²¹³ Departamento Agrario, *Memoria, 1940-41* (México, 1941).

²¹⁴ See Banco Nacional de Crédito Ejidal, S.A. [BNCE], *Informe que rinde el H. Consejo de Administración del Banco Nacional de Crédito Ejidal, S.A., a la primera asamblea general ordinaria de accionistas, ejercicio de 1936* (México, 1937); and BNCE, S.A. *Informe que rinde el Consejo de Administración del Banco Nacional de Crédito Ejidal, S.A., a la cuarta asamblea general de accionistas, por el ejercicio de 1939* (México, 1940).

²¹⁵ Foglio Miramontes, *Geografía económica agrícola del Estado de Michoacán*, vol. I, vii.

²¹⁶ México, SEN, DGE, *México en cifras*, 1.

²¹⁷ See Ervin, “The Art of the Possible: Agronomists, Agrarian Reform, and the Middle Politics of the Mexican Revolution,” (Ph.D. Dissertation: University of Pittsburgh, 2002), especially chapter five.

²¹⁸ Data on foreign trade, for example, was singled out for its accuracy. See “Organización y funciones del Departamento de la Estadística Nacional,” *Estadística Nacional* 3/52 (30 marzo 1927), 4. Moreover, the accuracy of data on shipping placed Mexico “among the most advanced countries.” See México, *Memoria que el C. Ing. Juan de D. Bojórquez*, 34.

²¹⁹ *Sonora, Sinaloa y Nayarit*, 498.

²²⁰ SEN, DGE, *Geografía económica del Estado de Hidalgo*, 5.

²²¹ SEN, DGE, *Memoria de la III Reunión Nacional de Estadística*, 17.

²²² México, SEN, DGE, *Memoria de los censos de 1935*, 7.

²²³ DEN, *Memoria de los censos generales de población, agrícola, ganadero e industrial de 1930* (México: Talleres Gráficas de la Nación, 1932), 124.

²²⁴ México, SEN, DGE, *Memoria de los censos de 1935*, 8.