

## Introduction



In the early morning of November 28, 1607, many of Mexico's most prominent men, including Viceroy Luis de Velasco the Younger, several members of the *real audiencia*, and the king's envoy, *visitador general* Diego de Landeras y Velasco, set out from the imperial City of Mexico to perform an important ceremony in the northeast quadrant of the Valley of Mexico, the large basin surrounding the city. Accompanied by a scribe to record the events of the day, the party arrived a few hours later in the Indian hamlet of Nochistongo.<sup>1</sup> They attended mass in a hut, and when they emerged the viceroy was given a hoe. We might imagine him pulling soft gloves over his delicate hands, securing his spectacles on the bridge of his nose, and grasping the handle of the tool. Taking a deep breath of the crisp, country air, he heaved the tool over his head and sunk its blade into the crusty ground. More than one blow would have been necessary. From some distance, fifteen hundred Indian workers watched. What a sight it must have been for them—a nobleman breaking a sweat. When Velasco was done, the little pile of dirt he had dug was blessed as cheers filled the air. Behind the severe expression on his face, the viceroy must have felt pleased—or at least relieved—to be breaking ground for this new project.

What kind of project in the countryside could require such ceremonious beginnings? The handful of dirt the viceroy had dug was in fact the first of some sixteen million cubic meters of earth that would be excavated by the end of the colonial era for the Real Desagüe de Huchuetoca, a massive hydraulic project intended to drain the lakes that surrounded the City of Mexico. At the time this project was begun, the lakes still ringed the capital much as they had under the Aztecs, even though it had been nearly nine decades since Cortés had arrived for the first time in Tenochtitlan. It was not the lakes themselves that vexed the Spaniards as much as their tendency to periodically swell with runoff from the surrounding mountains and flood the increasingly important city. Because

it seemed essential to the survival of the city itself, the Desagüe was an undertaking far weightier than the construction of any single building.

By draining the lakes, urban elites believed they could free up the lakebeds to accommodate all the seasonal runoff and thus protect their palaces and streets from flooding. But draining the water away was no small task, since the basin in which the City of Mexico lay had no outlet. It would require perforating the hills that ran along the basin's northwestern margin. Doing so would be, in essence, to reverse the geological clock to before the Quaternary Period, when the basin of Mexico was still a valley, draining southward. As an engineering achievement and given the knowledge of hydrology, hydromechanics, and geology of the epoch, the Desagüe is massively impressive. That elites in New Spain would even contemplate a project that they knew was herculean speaks to the value they accorded their capital city. The City of Mexico was fast becoming the most important city in the Spanish "empire of towns."<sup>2</sup> Quite simply, it had to be protected from floods at all costs.

Over the eleven months that followed the launching of the drainage project, urban technicians and sixty thousand Indian laborers bored through the northwest mountains of the basin using ingenious applications of mining technology, aided with winches and draft animals, to create the thirteen-kilometer-long Desagüe. The most notable feature of this device was a tunnel seven kilometers long, running as deep as fifty-six meters under the surface, capable of conveying water captured in the northwestern lakes out of the basin altogether. It was one of the most ambitious early modern public works projects undertaken by Europeans anywhere.

There was great jubilation in the City of Mexico when the tunnel and its feeder canal performed well during the first rainy season that put them to the test, in 1608. But this initial success was far from the last word on the Desagüe. To continue to perform their functions over time, the tunnel and canal would require considerable and difficult modifications. The tunnel began to fail partially soon after its first year, and after a catastrophic flood in 1629 colonial officials became convinced that it would have to be converted into a vast open trench if it were to offer any protection from flooding at all. Although technicians were at first confident about completing the trench conversion swiftly, the project stretched on for more than 150 years, for reasons that will be explained. In addition to being an ongoing construction project for much of the colonial period, the Desagüe grew in size and complexity. While they slowly excavated the open trench, the thousands of people who worked in the drainage project over time built countless dams, levees, river diversions, silting pools, sluiceways, and other devices both within the Desagüe district and far beyond, as technicians and officials gained a better understanding of the

interconnected hydrology of the basin and the multiple causes of flooding. Over time, these structures were increasingly coordinated to function in tandem with the Desagüe proper, making the Desagüe project the vastest and most complex dessication effort in the Americas during the period, commanding considerable resources for construction, administration, finance, operation, and maintenance.<sup>3</sup>

Looking beyond the colonial period, it becomes evident that the drainage project was never really completed. President Porfirio Díaz continued with attempts to perfect the system in the late 1800s when he ordered the construction of the Sistema de Desagüe del Valle de México, which collected both rainwater and sewage from as far as the eastern side of the city and drained it out through a canal and tunnel that ran east of the colonial Desagüe. The old Desagüe de Huehuetoca was not abandoned, as some of its structures were hitched to the newer one, which underwent further modifications and additions in the 1940s, in the 1970s, and then more recently.

Despite their huge financial and even greater human costs, both Desagües periodically failed to protect the City of Mexico from floods, much like the modern system. During the colonial period, officials sometimes wondered whether maintaining the Desagüe was worth the effort and resources. Painfully for its defenders, the only true standard by which the drainage can actually be considered “finished” is not the absence of flooding in the city, but the fact that save for a few polluted remnants in the south and north of the basin, nothing remains of the ancient lakes today.



Notwithstanding its mixed success in achieving its stated objective, the Desagüe had enormous repercussions for the indigenous and Hispanic people living in the basin, for colonial elites, and for the Spanish empire as a whole. By transforming the physical, hydrological, and biological environment of the basin, the Desagüe irreversibly changed the conditions of life for everyone in it, rendering it more amenable to Spanish patterns of production. By keeping alive into the late colonial era the method of coerced indigenous labor, it brought into play the protections conferred by the crown upon indigenous villages and thereby had a hand in sustaining the peasantry as a class. By allowing elites in the city to remain focused on rentier priorities rather than productive ones while other sectors of this class were expanding capitalist social relations and modes of production into a variety of locales and activities, it militated against “founding capitalism,” to borrow John Tutino’s phrase, in all of New Spain.<sup>4</sup> In short, the Desagüe played a central role in the process of colonization and helps explain the unique way in which that process unfolded in the basin, while

also illuminating how colonization shaped early modernity in the Atlantic as a whole.

Though “merely” a collection of excavations and built structures, the Desagüe mediated the superimposition in space of two distinct forms of social—the one transplanted by Europeans vested in primarily private relations of property and production and the one surviving from the pre-Hispanic period vested in primarily communal ones. Each form of social organization had its own way of valuing land and water and their respective biota. Outwardly divided by ethnicity, Hispanics and indigenes were more fundamentally distinguished along the axis of social class. Each class and class sector had very different interests, and their conflicts played out in the Desagüe-modified terrain of the basin, regulated by a dynastic state apparatus with its own priorities. The complex and contingent process of colonization that occurred in the basin was shaped largely by this class-based conflict. Because the Desagüe was so important in mediating the environmental and technological dimensions of class conflict in the basin, it is possible to learn a great deal about the dynamics of colonization by uncovering the social relations and class priorities embedded in even the most unglamorous of structures in the drainage project.

To extract these insights from the Desagüe entails questioning a number of assumptions that have characterized writing about the drainage since the early 1800s. Consciously or not, most scholars have looked at the drainage project from the perspective of the urban elites of the City of Mexico, who were firm in their belief that the phenomenon of flooding endemic to the basin of Mexico was a problem for all and that it had to be solved. Taking for granted the ubiquity of this perspective, these scholars unwittingly generated a grand narrative under which flooding was a universal “problem” and that its solution—the Desagüe—was a universal social good. This has precluded seeing the Desagüe as primarily an expression of the interests of the elites in the capital, as a “public works” project that had differential benefits and costs for different social classes and groups.

The urban-centric orientation arose in part from an inherent bias in the sources used by scholars. Over its long history, attitudes toward the Desagüe were as diverse as the people who made it, but not all attitudes were reflected in the formal *letrado* sources favored by historians. The fact that this record is eloquent about the attitudes of urban elites and bureaucrats, but rather quiet about those of Indians and rural Hispanics was not considered.

Unquestioned, this record became the primary source for the great Prussian savant Alexander von Humboldt, who kept it in mind as he visited the Desagüe in 1803 and 1804 and wrote his 1808 *Essai Politique*

*Sur le Royaume de la Nouvelle-Espagne*. Born at the cusp of the enlightenment and birth of liberalism, Humboldt could not avoid infusing his otherwise reliable treatment of flooding in the lacustrine basin and the Desagüe with his generation's desires and regrets, which in turn inspired later generations of scholars, statesmen, and travelers writing the story of the Desagüe.<sup>5</sup> The tumultuous decades that followed the collapse of Spanish rule tempered the optimism of many authors who wrote about Mexico, but perhaps none was more insightful than geographer Manuel Orozco y Berra, who sensed the pitfalls of hydraulic projects undertaken for the benefit of a single city.<sup>6</sup>

But in the last three decades of that century the stable oligarchic republican regime born out of the liberal and conservative convergence resuscitated Humboldt's hopefulness among the elites. Under Porfirio Díaz, they found it possible and desirable to rescue the drainage project from the doldrums. Anxious officials and academics scoured the artifacts that colonial "creole ingenuity" had legated to them for evidence of their country's capacity for liberal modernity. In their hands, the Desagüe was buoyed to an unambivalently prideful place among the great myths about Mexico's past. Antonio García Cubas, Mexico's preeminent nation-building cartographer of the epoch, featured the Desagüe as one such symbol alongside vignettes of the Castle of Chapultepec, the Belem paper mill, and other emblems of Mexico's bounty and modernizing achievements in his 1885 *Atlas Pintoresco e Histórico de los Estados Unidos Mexicanos*.<sup>7</sup> Subsequently, scholars have rarely if ever questioned the assumptions built upon Humboldt. They especially avoided asking whether flooding was a problem for everyone, after all, or just for those who fantasized about their imagined nation's glorious ascent to the heights of capitalist progress.

One must abandon the urban-centric perspective and the assumptions stemming from it to recognize that, in fact, little about the Desagüe was inevitable. That is, no objective factors *forced* it into existence or to develop the way it did. The phenomenon of flooding endemic to the basin of Mexico was a "problem" only for some sectors of the population. Even if one accepts that it was inevitable that overflowing lakes would be defined as a problem, many possible options were available for addressing it, each with different costs and benefits for different social groups.

It is undeniable that the water brimming over lakes damaged public and private urban property and made life in the city difficult. But it is also true that the floods were a precondition for a large part of the basin's agricultural productivity, especially for those indigenous and even some nonindigenous cultivators who had built their practices around the seasonal rise and retreat of water over significant swaths of land (see Figures 7.5 and 7.6). To control flooding was to thoroughly compromise the

ecological productivity that had supported large human populations in the basin for millennia. So to take for granted that authorities *had* to end flooding in the basin of Mexico obscures the specific interests and motivations that lay behind the Desagüe, and those that were excluded from it.

Moreover, flooding itself is a dynamic and complex phenomenon. Floods in the urban hub of Tenochtitlan-Mexico were not, like smallpox, unwittingly unleashed by the actions of the Spanish. As is well known, all its causes—the loss of ground cover, deforestation, the disturbance of the soil and silting of lakebeds—were already well under way before the Spanish arrived. But because flooding is sent to an analytical corner, so to speak, by urban-centric, Whiggish scholarship, it tends to sit there, immobilized, for the whole period, becoming a “fact” that remains unaltered in its origins, causes, and implications.



The Desagüe, as a set of physical structures and a landscape modified by those structures, both reflected the interests and values of the elites in the city and acted as a kind of stage upon which other social classes contested the expression of those interests and values. This much can be seen by simply removing the blinders imposed by the traditional Desagüe narrative starting with Humboldt’s own useful assessment of the Desagüe. This assessment had two components—one “developmental,” fraught with liberal desires and lamentations; the other purely hydraulic. In the pages that follow, these two components will correspond roughly to the terms “conceptualization” and “design.” Conceptualization designates both how social and bureaucratic elites in the city valued water, land, biota, and energy and how this translated into a strategy of preserving wealth and rents in the city from what seemed to them to be their worst enemy—floods. Design refers to the materialization of this conceptualization in concrete structures, from the much celebrated tunnel to the most overlooked dirt dam. Humboldt noted with pain the detrimental effects of the Desagüe on indigenous survival through its history, and while lamenting the fact that the conceptualization had not included elements he thought essential to progress, he fundamentally agreed that the city had to be protected and that it was up to the elite to decide how. It would be unreasonable to expect a person of his epoch to question the right of the select few in the city to dictate the uses of nature for all or hope for anything but that these people show themselves capable of making such uses consonant with the capitalist transformation of the society they ruled for the prosperity and happiness of all. But in our epoch, when it has become evident that where realized these hopes have not quite yielded such blissful results, as it is essential that we do.

We can start by using historical analysis to dissect and make conspicuous the conceptualizations and designs of the material and social structures from the past that still inconspicuously make us march along the same, exhausted developmental paradigms. The next step here, then, is to uncover the capital's interests, and how it attempted to project them onto the hinterlands through the materiality of the drainage. How is it possible to discover the physical workings of the class conflicts and their results—to “deconstruct” the conceptualization, design, and execution of the drainage?

Obviously, physical factors such as the geomorphology of the basin and the technology of the era can explain much of the material form and functioning of the drainage. But the logic by which this technological and organizational marriage took shape is accessible only by examining the everyday actions and difficulties of technicians in shaping the earth and directing water, on the one hand, and the social context in which they operated, on the other. What links actions, material realities, and social context together are people's technological *choices*. The resulting material structures are concrete manifestations of these choices. That is why each structure within the Desagüe can reveal the priorities of the social actors who made the decisions about how those structures would be constructed, where they would be sited, and for what ends and in what manner they would function.

The concept of desiccation as a solution for flooding in the urban core reflected how its elite makers valued water, land, biota, and energy (human or otherwise). The designs the subordinate technicians created indicate their general acceptance of this conceptualization—they were not rebels, after all. But technicians had choices about how to shape the Desagüe that were neither predetermined nor as constrained as they might seem. To be sure, there were limits to the choices, but they were not purely financial, cultural, physical, or even technological, as most authors represent them. Of course these factors matter, but the true boundaries of the possible were set by mutable yet fairly stable *social factors*: the composition and priorities of the ruling urban elite and the persistence of an indigenous peasantry with a degree of control over the land, the water, and the ecosystems that the elites sought to transform.

The concrete choices that the Desagüe's architects and technicians made were choices among distinct technologies. These technologies were quite diverse. In addition to the indigenous ones, there were at least three distinct imported ones—Muslim, Iberian, and Roman. Further diversity within all four was added by the specializations in various realms of activity—agriculture, military and civil construction, mining, and so on. Each technology involved the use of particular materials (physical and biological) and particular methods and sequences of actions given meaning and utility by the cultural context in which it was embedded.

Researching such technological choices requires the proper conceptual and methodological tools.

While useful, the social constructivism advocated by Thomas P. Hughes and others is used here only in a very general way because it does not offer precise enough tools for analyzing discarded options or social effects.<sup>8</sup> Originally developed by anthropologists in the 1930s to study how cultures incorporate features of another's techniques, and since redeployed for other uses, the concepts *acculturation* and *transculturation* will not do here either, for two reasons. First, in the Desagüe not two cultures but many cultures confront one another, and since these concepts were developed as tools to examine cultures in colonization, and not classes in colonization, they would render the class content of the Desagüe-facilitated colonization of the basin's hinterland inaccessible, whereas the purpose here is to find it.<sup>9</sup> Second, while it is common for writers to refer to technology and other cultural products in colonial Latin America as "hybrid" or "mestizo," in the case of the Desagüe the tendency has been to categorize the technologies underpinning the various designs as either European or creole. All four of these descriptors have been used in a basically genetic way, in the sense that as tools of analysis they treat artifacts as though they were living organisms formed by random combinations of their parents' DNA. In addition, *mestizaje* is so heavy with associations with the foundational myths of Mexico, so synonymous with Mexican-ness, that it often acts as an analytical blinder.<sup>10</sup>

The conceptual tool most useful to the approach of this book is the notion of technological choice used by French anthropologist Pierre Lemonnier and others. Technological choice, Lemonnier explains, "emphasizes the sorting out of possibilities on which the development of a technical system is *de facto* based, although usually in an unconscious and unintentional way."<sup>11</sup> This concept is useful because the record does not always provide a conscious, intentional expression of these choices in the voices of the human actors in the Desagüe. It is sometimes necessary to try to recreate the conceptual universe of technicians and officials and infer the logic of their selections from it. The conceptual universe of such men was shaped by interests and values of the classes or groups they affiliated with and by ideas of a more philosophical nature expressed in part through the written word. The most formalized of Desagüe writings were the *memoriales* or *relaciones*, which men in charge of the project or aspiring to be given commissions in it wrote for higher officials, seeking recognition and rewards or exoneration from blame. By their nature, with their self-conscious authorial voices, these texts can obscure or overemphasize certain characters and actions. The fact that most of those who worked in the Desagüe expressed themselves mainly through their actions on matter, not on paper, threatens the usefulness of these sources. For this reason,



borrowing from the gaze that Peirce Lewis proposed decades ago, as updated by Don Mitchell, here the “ordinary vernacular landscapes” that the men in charge and their subordinates created through their choices will also be considered as an eloquent if “unwitting” expression of the conceptual and historical universe within which they operated.<sup>12</sup>

It would take a full-scale archaeological excavation to find the complete material record of the Desagüe. The alternative is to read the documentary record with an eye to the actions of Desagüe subordinates ranging from its coerced rotational labor force to its on-site wardens. As we will see, Indians were the backbone of the Desagüe, while the *guardas mayores*, *guardas menores*, and the non-*letrado sobreestantes* (the resident general wardens, the wardens under them, and the foremen) were its spinal cord. Through the comings and goings of friars, architects, military engineers, creole savants, oidores, and others whose voices prevailed in the works at one time or another, it was these less-visible actors who actually ran the Desagüe’s daily functioning as a drainage device and executed much of the repair and modification work on the ground. These people are difficult to follow because while the record does name them, it only sporadically provides details of their actions, and more rarely still of their thoughts. This does not mean, however, that the Desagüe lacked a “literature” generated by its own actors.

Alongside the formal memoriales and relaciones, there is an abundance of dispatches among guardas, between guardas and superintendants, recorded verbal reports from sobreestantes, financial accounts, and so on. In contrast to the deliberate, often rhetorically ornate language of formal Desagüe writing, these mundane communications are terse, more unselfconscious and revealing. Even illiterate sobreestantes passed on their knowledge about the behavior of water, the terrain, people, and plants in their domain orally during interaction with guardas, technicians, and officials, who then folded it into the written record. This record was known as “the books of the Desagüe,” and included the collected *autos* (writs), dispatches, and other important instructions and orders that arrived on the Desagüe site and sometimes duplicates of outgoing reports as well. Besides city and audiencia archives, these books were kept under the responsibility of guardas mayores in the Casa del Desagüe, the headquarters in Huchuetoca. Guardas mayores passed on these books to their successors “by inventory,” so that their contents could be both confirmed there and consulted more expediently when needed.<sup>13</sup>

Guardas and sobreestantes provided the thread of technological continuity in practice and were also the bearers of much of the working memory of the Desagüe, the orality of which we can glimpse through their dispatches and reports. Collectively, the origins and trajectories of guardas and sobreestantes show both how fluidly specialized knowledge of

the material world moved among nonspecialists and across social ranks, and how easy this is to overlook: much technological and hydrological knowledge was acquired and transmitted orally, experientially, on site, and over generations. While scholars of early modern Europe recognize the importance of such socially spread expertise for knowledge production, preservation and deployment,<sup>14</sup> in Desagüe histories the focus had been on the select few technicians who authored memoriales and other authorial reports, and on the bureaucrats, savants, and academicians who belonged to the universe of the city, the letrado culture of which is in many ways difficult to consider more relevant than that of the overlooked on-site subordinates. It seems terribly unjust that such men should have gone unnoticed or even disdained by the “enormous condescension of posterity,” as E. P. Thompson might have called it had he turned his attention to this side of the ocean. Worse, it has blinded historians to the significance of such transoceanic similarities for a fuller understanding of early modernity.

The fact is that the Desagüe involved both Old and New World forms of “tacit knowledge.” This conceptual tool allows scholars to see knowledge that is embedded and transmitted in the gestures and sequences of work and in objects themselves.<sup>15</sup> This kind of knowledge was the specialty of the guardas and sobrestantes and their workers. Without these men, the proposals of the most capable of letrados, technicians, or superintendants were nothing but words.

The Hispanic technicians, wardens, foremen, oidores, and superintendants who intervened in the Desagüe over the course of the seventeenth century tapped a wide range of tacit knowledge, both in their own traditions and in the indigenous ones, and recombined it in the drainage structures. Like Mukerji’s Languedoc laundresses or Appuhn’s *terraferma* peasants, indigenes living in the vicinity of the Desagüe works provided their expertise both voluntarily and under coercion. This expertise included the mobilization and coordination of labor; the seasonal organization of tasks and processes; familiarity with soils, minerals, and plants suitable for hydraulic engineering; and knowledge of the layout of the terrain and the behavior of water over it. Of these types of knowledge, the social dimensions that were liable to Hispanic appropriation are by now familiar. For example, we know that the repartimiento system of labor recruitment that began in 1555 for public works and eventually took groups of men from villages to deploy them in the Hispanic economy more generally were appropriations of the pre-Hispanic *coatequitl* (the summons of labor crews from subject communities).<sup>16</sup> But how the technological appropriations happened is a bit more mysterious.

In general, the choices technicians made among the whole universe of methods and materials available to them in order to design and shape

the drainage were largely a result of how their own backgrounds intertwined with the tensions among elites in the imperial capital of the City of Mexico and between the elites and the peasantry over the same geographical space. Similarly, indigenes, as we will see, also used technology to interact with the drainage, a project that was placed among them and demanded their participation. But, since overall their ways of valuing water, land, biota, and energy were different from Hispanics, it follows that they designed their technologies differently too, even while appropriating from and interacting with what Hispanics were doing all around them.



Clearly, the Desagüe-assisted colonization of the Valley of Mexico by people from Spain was unique, distinctly different from the colonization of other parts of North and South America that took place at the same time. Other Europeans used different strategies to submit territories and their indigenes in Old and New Worlds to their wills; these indigenes had different political systems and responded in diverse ways to colonizing groups; arguably, in no other locales of the New World were massive public-works projects implicated so deeply in colonization by Hispanics as they were in the Valley of Mexico. The methodological lens used in this book, with its focus on the concrete structures of the Desagüe and on-the-ground choices by local actors, would seem, if anything, to emphasize the one-place-in-time approach of the work. Yet the Desagüe has much to say about the process of colonization in general—and therefore about such diverse topics as the relationship among colonization, empire building and nation-state formation, the origins of capitalism, the development of knowledge about nature, and the creation and deployment of expertise.

The first step in expanding the analytical frame within which the Desagüe has relevance is to understand the Iberian realm as an integral, rather than marginal, part of early modern history, from the political to the economic and the cultural. It really makes no sense to consider the Desagüe's story as illustrative only of "Spanish colonial" behavior, especially since under the Habsburgs the Americas operated and were regarded more as kingdoms of the patrimonial dynasty. And the Desagüe itself must be seen as an eminently European project, not a Spanish outlier. Its promoters and builders drew their inspiration and knowledge from far and wide and synthesized it into the project. Spanish diplomats scoured the courts of Paris, Milan, and Brussels for hydraulic experts who might be lured to Mexico, and ingenious tinkerers of the most varied callings pored over very European Vitruvian architecture treatises and mining and military engineering manuals for ideas and designs for the drainage of the lakes. The Desagüe was one of a kind to be sure, the material child of

a spectacularly intrepid late Renaissance imagination. It was impossibly complex. It was almost too vast. But as an attempt to bend the landscape to the human will, it was really a typical early modern “big-think” European engineering project.<sup>17</sup>

Next, one must recognize that all the fundamental social processes that accompanied colonization in the Valley of Mexico had their analogues elsewhere—both in the New World and on the other side of the Atlantic. Wherever communal modes of production and social reproduction held sway and began to be challenged by the imposition of private-property relations and the rule of mercantile capital, the processes and dynamics seen working over time in the Desagüe district are to be found as well, entirely distinct in their specifics but recognizable in their overall outlines. At the most general level, these parallels exist because all through the Atlantic realm during the early modern period, the people engaged in early forms of capitalist production strove to gain hegemony over both human labor and the environment, indistinctly of whether they were in Europe or the Americas.

As demonstrated by the story presented in this book, the locally contingent ways in which this occurred are seen with exceptional clarity when one examines its operation in marshy landscapes, like the Valley of Mexico, where the literally fluid nature of the relationship between water and land was an obstacle to the penetration of private property and capitalist social forms and modes of production and actually quite favorable to autonomous and communal forms. In such locales, which include the fens of Cambridgeshire and Lincolnshire in England, the wetlands of Poitevin and the Camargue in France, the lowlands of the Netherlands, and other seasonally flooded regions in Europe and in French Acadia, early capitalists and agents of the state undertook coordinated efforts to drain, dike, and otherwise dessicate the landscape to make it amenable to commercial grain or livestock production or other uses more in line with their interests.

These drainage and desiccation projects were outwardly very different from the Desagüe, but they all fostered colonization much as the Desagüe did. It matters, of course, that the Desagüe was a Spanish project and the estuarine reclamation in Nova Scotia during the seventeenth century a French one, just as it matters that both were “colonial” while the Great Level and the works of the Association pour le dessèchement des marais et lacs de France were “metropolitan.” But it is also true that these differences among these projects are not determinant. To see the parallels—and to gain valuable insights from understanding the differences—requires a conceptualization of colonization that focuses on its class content and does not get mired in the vague notion of colonization as the movement of some “peoples” or “nations” over others and their territories.

In the Atlantic realm, colonization was an intervention that varying alliances of early modern European social classes and sectors carried out on environments and humans in both the Old World and the New simultaneously, with or without legitimation from the heads of politics. Under this conception, “Spain,” “France,” and “England” did not colonize “America” so much as the different classes that formed part of early capitalism colonized water, land, and biota (as well as the relationship among them and what each meant to humans) in both Europe and America, creating nation-states and empires at the same time and as a result of the same dynamics, not the latter as a consequence of the former. Thus understood, colonization in the Valley of Mexico and parts of what became known as Spanish America was characterized by the superimposition in the same space of two distinct forms of social organization and production—and hence valuation of water, land, and biota—and the simultaneous intervention of a patrimonial, dynastic state apparatus with its own alliances and priorities. The different outcomes of this process throughout Atlantic early modernity and modernity were created mainly by the relationship of forces among the social groups involved—and by Whiggish hindsight.



The chapters that follow trace the everyday comings, goings, and tinkering of all whose technical expertise shaped the Desagüe, beginning with indigenes. The role played by urban and imperial elites and the crown will be examined in order to explain the constraints within which technicians, laborers, and villagers chose one technique, material, or process over another, and the overall social priorities and logic embedded in the drainage project in this particular instance of colonization. But it is the Desagüe’s wardens, foremen, Indian laborers and village hydraulicians, friars, guild architects, military engineers, and savants who are the protagonists of this book.

Chapter 1 discusses what indigenous hydraulic expertise looked like in the district of the Desagüe both before and after Spanish settlement and at the beginning of the drainage project. Chapter 2 makes use of this historical baseline in explaining specifically how the Desagüe departed from indigenous hydraulics.

Chapters 3 through 7 then explore the logic of choices, the continuities and changes in the Desagüe over the seventeenth and eighteenth centuries in the areas of design, practices, purpose, and social arrangements, and the implications of the project for land, water, the natural environment, and people, as well as for technology and science.

Chapter 8 explores how the understanding of the Desagüe built up over the preceding chapters can shed light on what colonization is and who

performs it. It does this by assessing the aforementioned drainage projects in Europe through the Mexican drainage. It interrogates these projects through the class definition of colonization presented above in pursuit of the links among all such environmentally transformative colonizations, early capitalism and state- and empire-building.

The span of time encompassed by these chapters covers three periods in the Desagüe. The first period is characterized by the creation and consolidation of specific designs and arrangements in the drainage during much of the seventeenth century. This period, chronicled in Chapters 2, 3, and 4, fizzles out near the end of the century, when concerns over the incomplete state of the project and its implications for the safety of the city in an unprecedented rainy season ushered in greater scrutiny of how the Desagüe looked, functioned, and was built.

After the initial period of consolidation, there were two waves of potential challenge to the established structure and way of doing things. The first wave, which marks the beginning of the Desagüe's second period, came in the form of the increasing influence and presence of royal military engineers starting in the final quarter of the seventeenth century. This wave, which continued well into the eighteenth century, had limited or delayed impact, except for a few notable areas of practice. Chapter 5 is devoted mainly to describing this period in the Desagüe's history.

The second wave, which defines the beginning of the third period of the Desagüe, began before the ebb of the first wave of challenge, since it started with the wide-ranging reformism of the Bourbons, which had its greatest impact from the 1760s onward. Cresting in the 1790s, this wave also had uneven impact. Its story is told in Chapters 6 and 7. In the case of both the first and second waves of challenge, the failures of potentially potent forces to fundamentally change the conceptualization and design of structures and practices put in place by the friars and master architects are telling, as are the few exceptions. Chapter 8 traces the implications of these failures for colonization.

The images in this book are not illustrations. Rather, they are integral to the analysis, and therefore readers are encouraged to examine them in their original color and in enlargeable digital form in the section dedicated to this book at <http://scholar.princeton.edu/candiani/>. Included there are also additional images that were not in the book for reasons of space.