

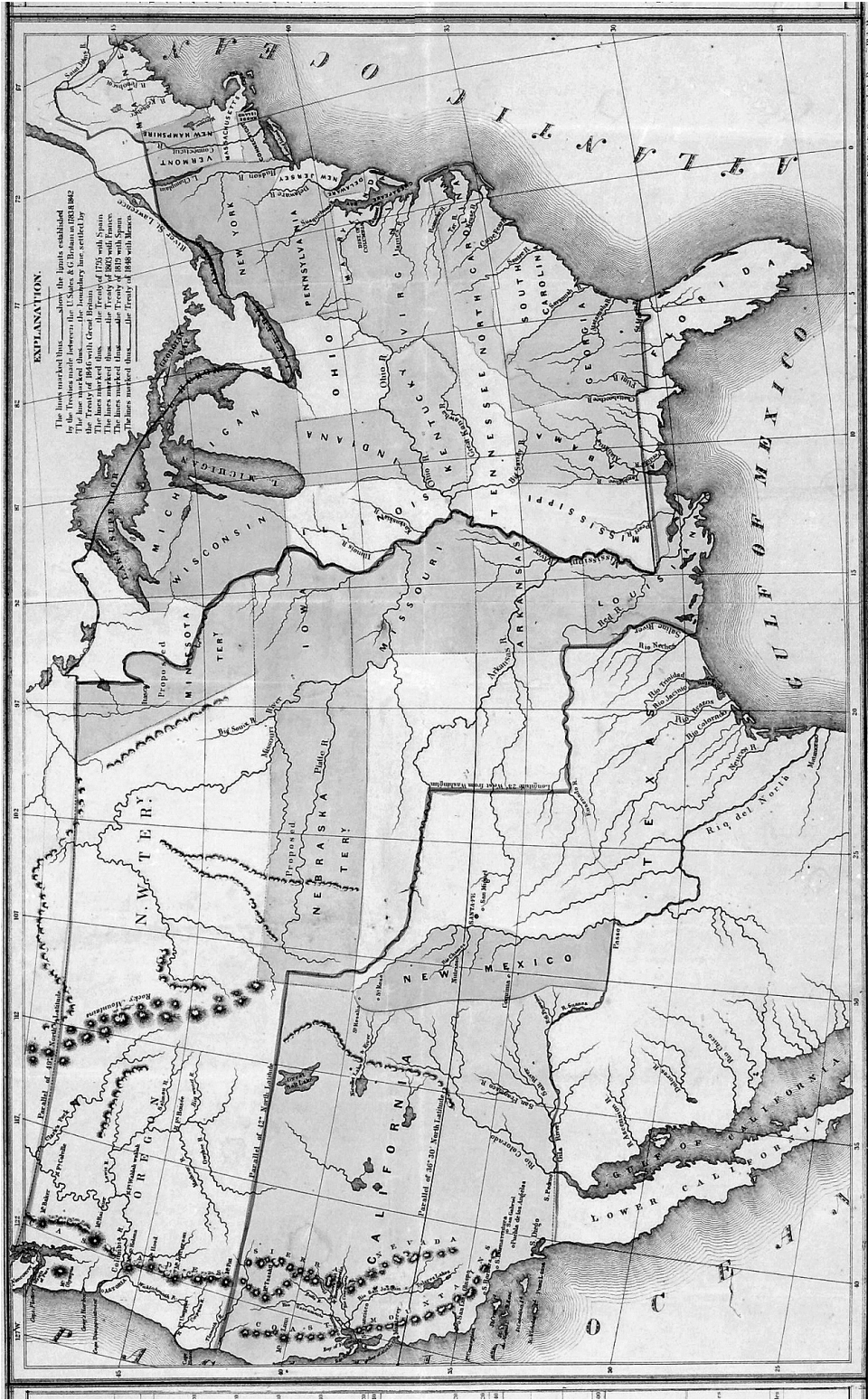
# On Unstable Ground

What methods of measurement, marking, and representation can secure a territory composed of impassable chasms, shifting sand, and unknown actors? In the mid-19th century, this question was at the forefront for the United States government as it sought to define the nation-state through a campaign of westward expansion that outpaced federal knowledge of the coveted territory. Colonial boundaries in North America – traditionally informed by natural barriers such as mountain ranges or bodies of water – referred to the abstract coordinates of latitude and longitude when no other information was available. An 1848 US federal map of territorial acquisitions documents this phenomenon. As land was accumulated through treaties with Great Britain, Spain, France, and Mexico, boundaries changed from articulated contours in the East to abstract lines leading straight to the Pacific. The constitution of such abstract limits was indelibly linked to regional documentation and the promotion of future settlement. To define the boundary was to define the geographic and ideological frontiers of an emerging nation.

Following the Mexican-American War, which raged from April 1846 to February 1848 and claimed an estimated 30,000 lives, Mexico and the US resolved a new boundary.<sup>1</sup> The 1848 Treaty of Peace, Friendship, Limits, and Settlement outlined the terms of reconciliation, designed to stretch over 600 miles from the Pacific Ocean to the Rio Grande. Separate national parties – composed of mirrored sets of head commissioners, surveyors, and supporting teams – were directed to designate the boundary by two methods: the production of “authoritative” maps documenting the region, and the construction of “land-marks” (later called border monuments).<sup>2</sup> Commissioner William H. Emory for the US and geometrician José Salazar Ylarreguí for Mexico emerged as national figureheads in the first iteration of the US and Mexican boundary survey. Emory, an officer in the US Corps of Topographical Engineers, had previously traveled the borderlands while charting a route through California during the Mexican-American War. Salazar was comparably inexperienced in the region, initially joining the Mexican commission as a survey

1. Casualty statistics for the Mexican-American War are debated due to incomplete records, particularly for the Mexican wartime population, and a high disease mortality rate that accounted for nearly half of all war-related deaths. For published estimates, see Vincent J. Cirillo, “More Fatal than Powder and Shot’: Dysentery in the U.S. Army During the Mexican War, 1846–48,” *Perspectives in Biology and Medicine* 52, no. 3 (Summer 2009); Department of Veterans Affairs, “America’s Wars,” Office of Public Affairs (Washington, DC, 2021); and José Bravo Ugarte, “La Guerra a México de Estados Unidos (1846–1848),” *Historia Mexicana* 1, no. 2 (October–December 1951): 185–226.

2. See Treaty of Peace, Friendship, Limits, and Settlement with the Republic of Mexico, Article V. Both the Mexican and United States survey teams produced a comparable set of 54 sectional maps at the scales of 1:60,000 and 1:30,000 documenting the boundary line and surrounding region. Each national set was reviewed and signed by commissioners Emory and Salazar. Due to a delay in production and size “too voluminous to admit for publication,” the maps were not included with the original boundary report. The Mexican map series is found at the Mapoteca Manuel Orozco y Berra in Mexico City. The United States map series is at the National Archives, Washington, DC.



Map of the United States depicting territorial boundaries after the Treaty of Peace, Friendship, Limits, and Settlement with the Republic of Mexico, 1848. All images courtesy the author.

P.O.S. Howland, Scranton, Pa., Printers & Publishers

3. See William H. Emory, *Report on the United States and Mexican Boundary Survey, Made Under the Direction of the Secretary of the Interior* (Washington, DC: A.O.P. Nicholson, 1857); and José Salazar Ylarregui, *Datos de los trabajos astronómicos y topográficos, dispuestos en forma de diario, practicados durante el año de 1849 y principios de 1850 por la Comisión de Límites Mexicana en la línea que divide esta República de la de los Estados-Unidos* (Mexico City: Imprenta de Juan R. Navarro, 1850).

4. Treaty of Peace, Friendship, Limits, and Settlement with the Republic of Mexico, Article V.

5. Emory, *Report on the United States and Mexican Boundary Survey*, 2.

6. William H. Emory, *Lieutenant Emory Reports: A Reprint of Lieutenant W.H. Emory's Notes of a Military Reconnaissance* (Albuquerque: University of New Mexico Press, 1951), 176.

7. See Frederick Merk, *Manifest Destiny and Mission in American History: A Reinterpretation* (New York: Alfred A Knopf, 1963).

engineer with a background in mineralogy. In the 1850s, both figures published primary federal reports for their respective countries.<sup>3</sup> They were robust documents, several hundred pages in length, representing the culmination of each commission's efforts. Comprising personal narratives, descriptions of territory, maps, sketches, and extensive data sets, the reports offer distinct national views of the same region.

Redefining the border began at “the coast of the Pacific Ocean, one marine league south of the southernmost point of the port of San Diego.”<sup>4</sup> This location was specified by the treaty as the first in a series of points that would establish the US–Mexico border from the Pacific to El Paso and Ciudad Juárez, where the Rio Grande formed a natural marker. The “Initial Point” on which Border Monument No. 1 would be placed, and which all future markers would sequentially reference, was located on a distant shore, but the strategic importance of such a position was well understood by the US government. The Initial Point was already *there*, waiting, at the western limit of expansion. In this sense it functioned as both origin and terminus, a place where one traveled to initiate the process of tracing backward to the established states of the federal republic.

Emphasis on the “southern” position of the Initial Point was equally relevant to a location on the Pacific coast, and an issue of debate throughout treaty negotiations. The discovery of gold in California coincided with the dispatch of the first United States Boundary Commission from Washington. As Emory wrote while stuck in Panama with some 4,000 others waiting for transport to California, “Each person seemed to think that there was a limited supply of gold, and that his hopes of getting any portion of it depended upon his early arrival in the field.”<sup>5</sup> Establishment of the Initial Point signaled to an international audience that the valuable port of San Diego, deemed “one of the best harbors on the coast from Callão to Puget’s Sound,” along with the mineral deposits in California, fell under new jurisdiction.<sup>6</sup> Three years prior, the US had expanded its presence on the Gulf of Mexico with the annexation of Texas, leaving Mexico with little to negotiate but the latitude at which territory would be divided at the Pacific. After the US rejected two early Mexican proposals that aimed to retain much of the territorial land of Alta California and New Mexico, the first at latitude 36°30'N and the second at 37°N, Mexico settled for a division at the 33rd parallel, which would retain a vital land connection to Baja California.<sup>7</sup> Ultimately, Mexico surrendered approximately 1.2 million square miles, over half of its territory.



The politics surrounding national growth and identity were particularly fragile after the Mexican-American War. The Treaty of 1848 specified that Mexican citizens living on land newly acquired by the US could retain their property rights in said territories, but would automatically become US citizens and “incorporated into the Union of the United States” unless they elected to retain Mexican citizenship. To remain a citizen of Mexico, a formal declaration had to be submitted within one year from the date the treaty was ratified. Between the annexation of Texas in 1845 and the Treaty of 1848, the US population increased by approximately 75,000 individuals who were previously citizens of Mexico.<sup>8</sup>

While the Pacific coast served as a reference for redefining the territory’s sovereign limits, the boundary line that connected the West to the East was based largely on speculation because the land had not yet been accurately documented. Most notably, the 1847 Disturnell Map that served as the primary geographic reference for the Treaty of 1848, contained inaccuracies, including mislabeled or incorrectly positioned landmarks set to define new territorial limits.<sup>9</sup> The city of El Paso, for example, was indicated more than 40 miles north of its actual position, and land projected as suitable for a transnational railway route was marred with impassable chasms and rugged terrain.<sup>10</sup> In a letter to Washington, dated April 2, 1849, Emory wrote, “The inaccuracy of the map upon which the treaty was made, and which thereby became a part of the treaty, is notorious. It is also known to all who have been much in the frontier States of Mexico, that the boundaries of the States have never been defined on the ground, and are unknown.”<sup>11</sup> To document accurately, Emory said, one must physically inhabit the space of record. His point simultaneously distanced him from the controversial maps of predecessors while legitimizing a costly expedition of his own.<sup>12</sup>

The straight line division between California and Baja California unwittingly cut across a range of extreme landscapes in the Sonoran Desert. The survey of this land posed the first of a series of challenges that would plague the work of the US and Mexican boundary commissions and exposed a fundamental consequence of the abstract division of the uncharted territory. As Salazar testified, “It’s easy to mark a line on paper with a ruler and a pencil; but it’s not the same on site.”<sup>13</sup> This difficulty with the survey, estimated at 148 miles in length, was recorded by the US Commission: *The country is occupied by a succession of parallel ridges, striking the boundary nearly at right-angles, and separated by deep and*

8. See Richard L. Nostrand, “Mexican Americans Circa 1850,” *Annals of the Association of American Geographers* 65 (1975): 378–90.

9. Mention of this dispute can be found in several newspaper reports. See San Antonio Texan [pseud.], “The Mexican Boundary Commissions,” *Sacramento Daily Union*, November 24, 1852; Alex H. Stuart, “The Mexican Boundary: An Interesting Document: Report of the Secretary of the Interior,” *New York Daily Times*, May 10, 1853; and Washington Intelligencer [pseud.], “The Mexican Boundary,” *New York Daily Times*, June 3, 1853.

10. A southern route was assumed to be most feasible, where travel would not be compromised by heavy snowfall. In the winter of 1846, the Donner Party became snowbound in the Sierra Nevada Mountains en route to California.

11. Emory, *Report on the United States and Mexican Boundary Survey*, 21.

12. US Congress refused to provide financial support to survey teams documenting the boundary on several occasions due to reported inefficiencies and squandered resources. In 1852 alone, \$120,000 was withheld.

13. “En el papel se tira fácilmente una línea con una regla y un lápiz; pero en el terreno no es lo mismo.” Salazar Ylarregui, *Dates of the astronomical and topographical work*, my translation with Francisco Quiñones, 36.



*sometimes impassable chasms. It then falls abruptly to near the level of the sea. The remainder of the line stretches across the desert of shifting sand at the head of the Gulf of California, destitute for the most part of both water and vegetation, rendering it impossible to mark the boundary in the usual manner on the ground.*<sup>14</sup>

14. Emory, *Report on the United States and Mexican Boundary Survey*, 144.

15. *Ibid.*

16. *Ibid.*, 5.

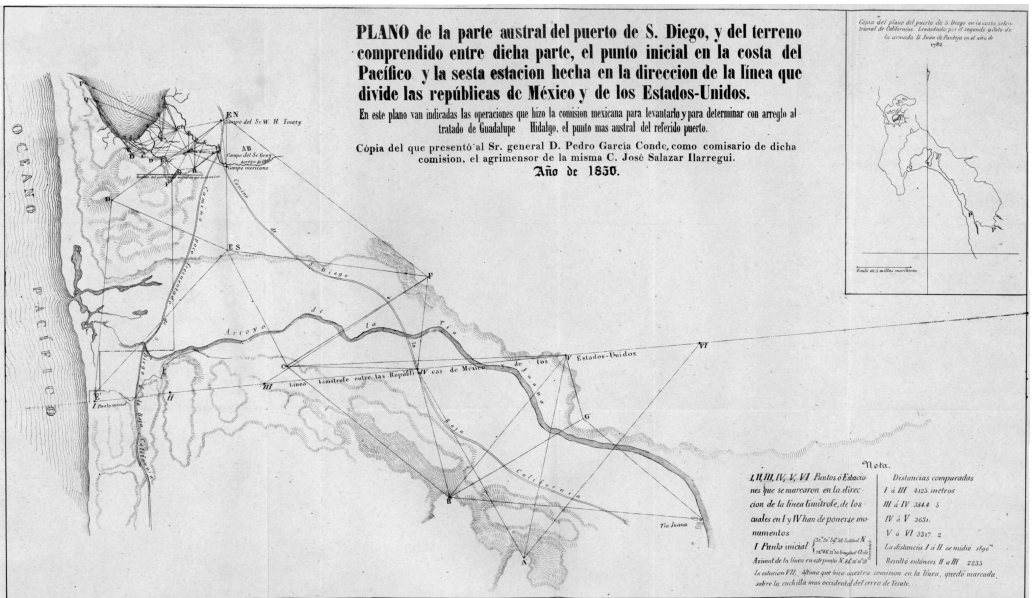
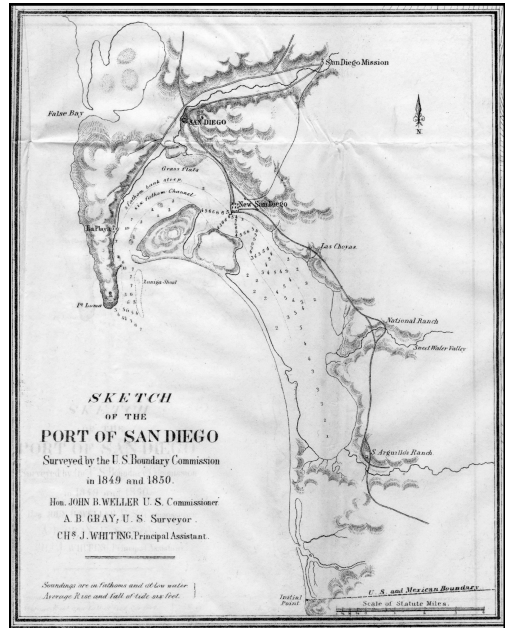
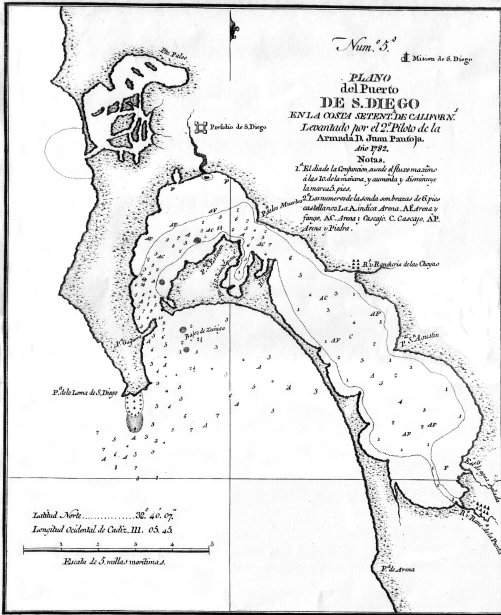
17. Salazar Ylarregui, *Dates of the astronomical and topographical work*, 16. Partial translation by Lorena Gauthereau-Bryson available at Rice University, <https://scholarship.rice.edu/jsp/xml/1911/36230/21/aa00355tr.tei.html>.

18. *Ibid.*, 13.

The Sonoran Desert was (and is) an unruly landscape not easily traversed. Fields of sand posed a threat to the border monuments, which required stable ground for their positioning and preservation. To complicate matters further, due to the extreme topography, the primary method of survey had to be based on astronomical observation. Triangulation would be more accurate, but the expense and slow nature of such an operation, particularly over terrain “unfavorable to geodetic operations,” deemed it impractical.<sup>15</sup> Therefore, latitude was measured by the difference in zenith stars and longitude by moon culminations. The immense scale made the process susceptible to an alarming degree of error. A small misreading would “produce a great departure of the line from the point it was intended to strike.”<sup>16</sup> In addition, the instruments used for such observations were delicate and prone to malfunction. In an inventory listing that singlehandedly undermined the entire Mexican survey, Salazar wrote: “The mercury leaked out of the barometers; the telescopes were short-range, the sextants had flagrant defects, the rulers did not have any type of apparatus, and only two thermometers deserved to be called as such.”<sup>17</sup>

These technical limitations and their susceptibility to error pushed the survey teams to generate extensive charts and astronomical measurements. Following protocol, each commission conducted their work separately and then presented the results to one another.<sup>18</sup> A surplus of official maps, statements, and coordinates was produced, leaving surveyors to reconcile distinct national measurements for the same region that often did not align. Directives instated for an exact plotting of the boundary led, in turn, to long paper trails of missteps, do-overs, and contradictions. Even the strategically placed Initial Point was not immune to complication. Its negotiated location, “one marine league south of the southernmost point of the port of San Diego,” referenced the outdated 1782 coastal map by sailing master Don Juan Pantoja. When survey teams from Mexico and the US convened in San Diego, the landscape depicted in Pantoja’s map had undergone 67 years of evolution. But a single bluff on the map could still be identified and subsequently served as the primary reference for new measurements.

Furthermore, the exact distance of one marine league was regionally defined. Without an international standard for



Top (left to right): Armada D. Juan Pantoja, Plan of the Port of San Diego in the Northern Coast of California, 1782; US Boundary Commission, Sketch of the Port of San Diego, 1849–50. Bottom: José Salazar Ylarregui and the Mexican Boundary Commission, Plan of the southern part of the port of San Diego and of the land surrounding the Initial Point on the Pacific coast and the sixth station made in the direction of the line that divides the Republics of Mexico and the United States, 1850.

19. For a complete account of negotiations at the Initial Point and the survey of California's international boundary during the first phase of the commission, see Charles W. Hughes, "'La Mojonera' and the Marking of California's U.S.-Mexico Boundary Line, 1849-1851," *Journal of San Diego History* 53, no. 3 (Summer 2007): 126-47.

20. Emory, *Report on the United States and Mexican Boundary Survey*, 26-38.

21. Alexander Millie, "California," *Illustrated London News*, January 5, 1850.

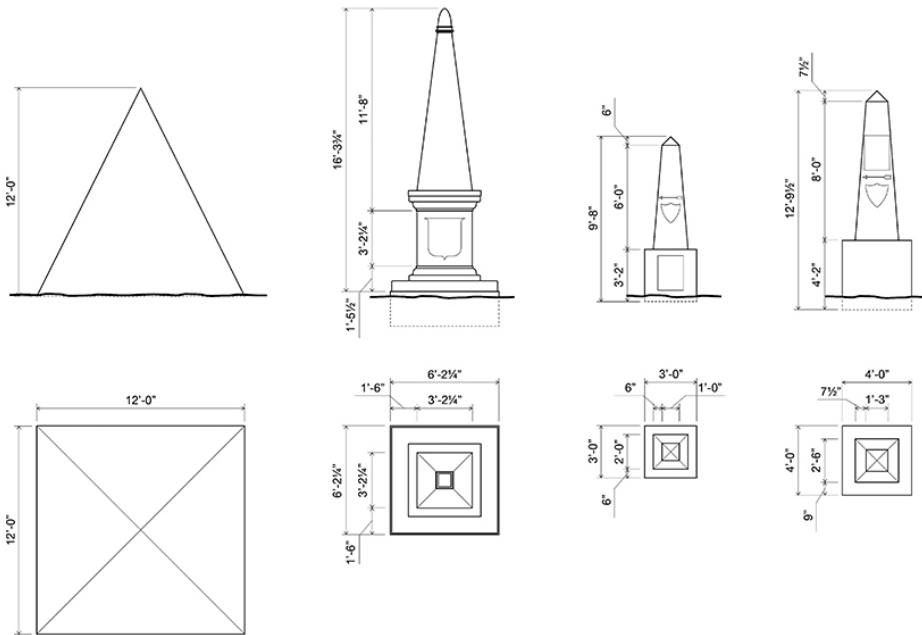
22. The monuments bound for California were designed and constructed by Messrs. E. & G.W. Blunt of New York City. The marble monument for the Initial Point and the cast-iron monuments leading to the Gila River were priced at \$2,000 and \$200, respectively. The Blunts also provided the commission with survey instruments and supplies, including barometers, tripods, and collapsible tents. Edmund L.F. Hardcastle, "Letter to Major W.H. Emory," *Congressional Documents*, v558, March 20, 1850, p 33-4; "An invoice of, and receipt for, instruments turned over by Messrs. E. & G. Blunt to Lieutenant Colonel J.D. Graham, in pursuance of an order from the Department of the Interior, dated January 2, 1851," *Report of Lieutenant-Colonel Graham, United States Department of War*, 32d Congress, 1st Session, 1852, 93-94.

length, the surveyors had to agree on the actual distance. This distance was plotted by each survey team, which produced separate maps that then required a final mediation.<sup>19</sup> When analyzed, the Mexican and American port maps of San Diego present the same geographic form but diverge at the level of detail. Variations occur in the exact contour of the port and location of a southernmost point, the number of channels that emanate from the principal body of water, the location and form of surrounding bluffs, and the indication of local roads.

The final geographic location of Border Monument No. 1 was a theoretical construct informed by the subjective views of two national survey teams and their negotiations on site. Throughout the survey, the nature of the boundary line was based on binational mediation in the field. For example, a boundary report, dated January 10, 1855, says that upon arriving at different observations for the location of a point on the parallel of 31°47'N on the Rio Grande, it was "mutually agreed to take the mean between the two results."<sup>20</sup> Discrepancies between parties were not attributed to human or instrumental error, but accepted as valid. And while the mediation of territorial limits was an ongoing process over the length of the boundary survey, the power dynamics at play between the two national parties must not be understated. Reporting on the founding ceremonies at the Initial Point, the *Illustrated London News* observed: "The countenances of the Mexican Commissioners exhibited a remarkable degree of gravity: they did not forget that they were affixing the last seal to the treaty for the dismemberment of their Republic."<sup>21</sup>

In total, 52 border monuments of various sizes and composition were reportedly placed during the first iteration of the US and Mexican boundary survey: one of solid white marble at the Initial Point; six of iron-plate to delineate the boundary between upper and lower California (with one, specified to be one-third larger than the others, positioned at the junction of the Gila and Colorado rivers); 42 of local stone at points suitable for human habitation; and three of dressed stone, formally transitioning from slender to squat, to mark where the boundary line meets the Rio Grande. None of these monuments, however, were visually represented in the first set of national reports. Without a transnational railroad, transportation of the monuments was lengthy and arrival times were unpredictable. The six monuments in California, for example, were produced in New York, then shipped around the southern tip of Chile to the port of San Diego, and then carried by mule and covered wagon to their respective destinations.<sup>22</sup>





Border Monument typologies placed during the first round of the International Boundary Commission, 2022. Drawings by the author.

Emory was wary of the undefined lag time between a surveyed boundary point and the arrival of a marker. An interim means of marking was critical “to secure the line beyond all cavil and for the convenience of property holders on either side,” he wrote to the Secretary of the Interior in 1849.<sup>23</sup> Thus the monuments documented by the commission were constructed by the surveyors themselves: “a pyramidal shape, twelve feet at the base, and twelve feet high, composed of stones and earth.”<sup>24</sup> Pyramids were the first formal means of constituting the US-Mexico boundary, constructed with the very rock on which they stood. To facilitate the project of national expansion, monuments were constructed wherever sources of water and stone would allow, particularly at sites on the boundary deemed fit for settlement.<sup>25</sup> These markers both designated the joint division of territory and called for the inhabitation of land by citizens on either side of the border.

The location of monuments also structured the forms and methods of regional documentation conducted by the US and Mexico. Placed by both nations, these artifacts operated across and reflected on separate territories, forms of settlement, and philosophies of nationhood. Border monuments were material proof that survey teams had occupied the very place for which they claimed to have authority and expertise, and the apex of each monument established a single, bilateral viewpoint from which two nations could document their shared frontier. To demonstrate the sightlines between

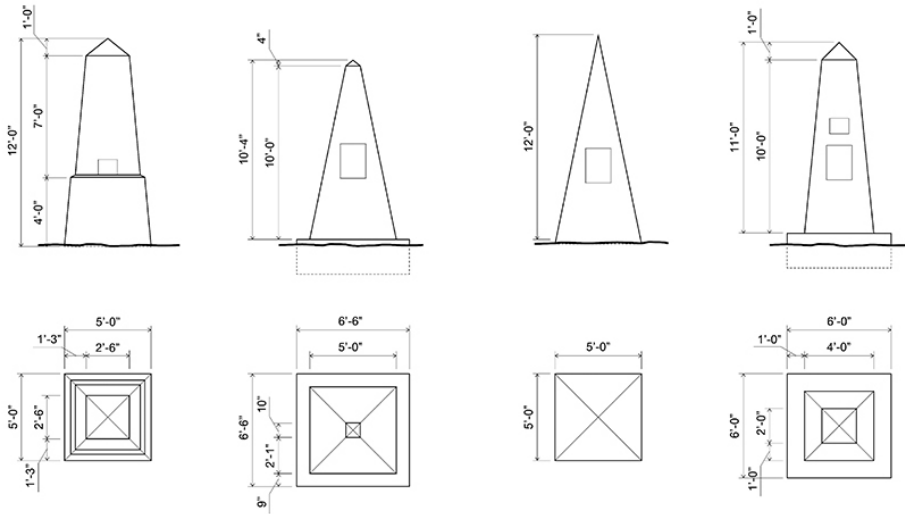
23. Emory, *Report on the United States and Mexican Boundary Survey*, 20. Emory would receive a response approving his independent approach nearly one year later in a letter from Washington, DC, dated April 10, 1850. The status of the official border monuments was addressed with the concluding lines: “The monuments are in course of preparation. And will be sent as soon as practicable.”

24. *Ibid.*

25. *Ibid.*, 32.

26. *Ibid.*, 96.

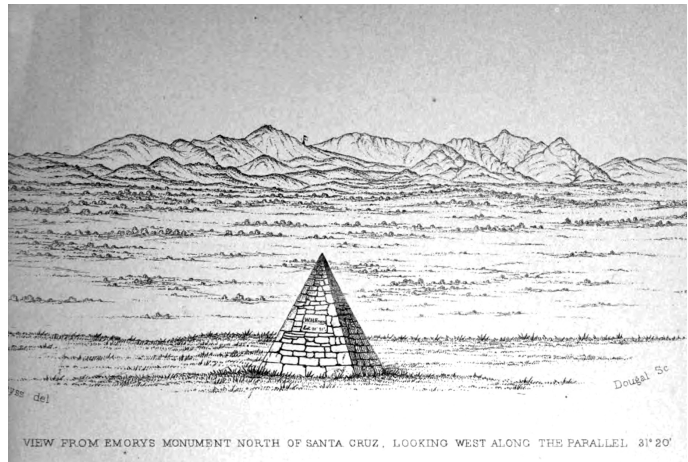
27. *Ibid.*, 98.



monuments, and from one pyramid to the next, 32 sketches were prepared to “perpetuate the evidences of the location of the boundary,” as well as to give “a very good idea of the topography of the country.”<sup>26</sup> Made by Austrian American landscape artist John E. Weyss as the commission progressed, the sketches communicate views along the length of the boundary and include distinctive landforms and vegetation. In some captions, “the line” of the boundary is referred to as if it were traced directly on the landscape. For example, Sketch No. 7 “gives a view of the Carrizalillo hills where they are crossed by the line. It leads up a steep valley across these hills, through an open valley, into another series of hills, where the parallel 31°47' terminates.”<sup>27</sup> The drawings depict expansive desert landscapes void of human presence. The only element that speaks to an observer is the vantage point from which the artist worked, at times serving as the single reference for the boundary when a border monument was absent.

Weyss was careful to omit the human figures of the American and Mexican commissions and any biases they may have represented. The drawings are framed as objective depictions of the international line, but a close reading reveals them to be purely hypothetical constructs; they establish the border through constructed viewpoints that had little bearing on reality. The series purports to document the visual link between monuments, but visibility between landmarks likely did not exist at this early moment of the border, and

John E. Weyss, *View from Emory's monument north of Santa Cruz, looking west along the parallel 31°20'*, in "Sketch of Territory Acquired by Treaty of December 30, 1853."



28. For example: "Monument XVII is placed on the 'Sierra de Sonora,' seventeen miles from XVIII. Three days were occupied in traveling this short distance. The trail for the first two was over almost impassable mountains; massive rocks and steep precipices constantly impeded the progress of and turned the part out of its course, making the route circuitous as well as hazardous; rough ascents were surmounted, steep ravines followed down, and deep gullies passed; the mules had actually to be dragged along." *Ibid.*, 120.  
 29. "The Boundary Stones: The Line Between Mexico and the United States Indistinct," *Atlanta Constitution*, April 25, 1888, 2.

moreover, monuments were reportedly spaced 10 miles or more apart, and over mountainous terrain.<sup>28</sup> Throughout the series, flags and pyramids on the horizon are rendered comically out of scale, revealing, at the very least, a manipulation of compositional elements and proportion. Furthermore, the early monuments were described as robust markers, 12 feet square at the base and 12 feet high, meaning the vantage point of each perspective is elevated high above the ground.

Once left unmonitored by government agents, the border monuments fell subject to the agendas of individuals operating outside of federal directives. The open wilderness depicted by Weyss was, in fact, inhabited by a diverse regional population. Survey members acting as tail-end inspectors reported monuments shattered, mutilated, or missing altogether shortly after their construction. An 1888 article in the *Atlanta Constitution* on the "indistinct" nature of the border reported that "cattle raisers, land hunters and minors of both nations, it appears, have not hesitated wherever it advanced their own personal interests to move a boundary monument bodily to a different locality, perhaps a mile or two south."<sup>29</sup> The monuments, artifacts of control with binational reach, were recognized as such by local agents and harnessed for regional gain, operating simultaneously at the scale of the individual and that of the nation-state. A condition framed by the US government as a problem of territorial definition was, more accurately, a problem of national identity and government control.

When Emory's report on the border survey was published in 1857, it included a disclosure: The fate and location of several border monuments was unknown, and reports of their displacement had been documented in both Washington, DC, and Mexico City. The artifacts positioned as the objective



30. Emory, *Report on the United States and Mexican Boundary Survey*, 38.

limits of national sovereignty could no longer be relied upon for absolute truth. “Therefore,” Emory declared, “be it *Resolved*, and agreed upon in the joint commission, that these maps and views . . . shall be the evidence of the location of the true line . . . as to the location of that line, shall be referred.”<sup>30</sup> Monuments were stripped of their federal capacity to designate the US–Mexico boundary and all authority was placed in the cartographic sources and the 32 landscape sketches.

At that moment in the mid-19th century, agreement on and production of this hypothetical geography allowed for the constitution of sovereign limits. Static depictions of a shifting landscape served as evidence of the boundary line and represented a new, ideological frontier for the US and its evolving relationship with Mexico. Yet far from the two nations’ capitals, the border monuments continued to operate as site-specific markers of sovereign territory, the only products of the US and Mexican boundary survey accessible to local populations. They were material evidence of a border in flux – active symbols of power and control in a region newly defined. Split by this fissure between the representational and the real, the border continued to operate in two distinct modes for the following four decades: in one form, as a hypothetical construct of fixed lines and views, and in another, as a series of disconnected material points – landmarks on unstable ground that were pushed, pulled, and dissolved by individual actors for their personal gain. These actions that tested the fixed nature of the border in the mid-19th century, enabled by nascent international limits that were widely unmonitored, can find their counterparts today in the neoliberal mechanisms surrounding industry, migration, and trade that condition the contemporary US–Mexico border. To combat the challenges this reality poses to traditional notions of the nation-state, the ambition to fix the international line by means of architectural and infrastructural interventions, and in doing so to promote a stable vision of the country at large, continues to dominate US federal policy in the region.

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