ONE

ARTHUR SCHOTT
MARKING THE MEXICAN BOUNDARY

A desert scene lies split between a narrow foreground of painstakingly rendered elements and an expanse of schematic topography (fig. 3). Formal echoes and dialogues knit the composition together. A leafy tip of a cactus stalk on the left side of the image echoes a flag at the center and points to a starlike burst in the sky, while the stone monument in which the flag is anchored shares a composite rotundity with a cactus to the right. The economy of the picture and the individuation of its motifs make the relations among the latter seem more syntactical than haphazard. The whole takes the form of a natural hieroglyph, a compact arrangement of organic and animated signs.

—[FIGURE] [insert figure 3 near here]

This odd picture belongs to a set of thirty-two steel engravings in Major William H. Emory's report to Congress of his survey of the boundary between the United States and Mexico (figs. 4–6).[1] Based upon ink drawings by the naturalist and surveyor Arthur Schott, these engravings represent views from points on the boundary between the one hundred eleventh meridian and the junction of the Gila and Colorado Rivers, that is, from approximately the longitude of Tucson to the California line (fig. 7).[2] The report contains a second and less striking set of thirty-two engravings based upon drawings by John Weyss that trace the border between the point where it leaves the Rio Grande and the one hundred eleventh meridian. Both sets of illustrations appear in the report's first volume, which was presented to Congress in 1856, printed in 1857, and distributed to government officials and prominent institutions and individuals in 1858. The ostensible purpose of these views was to provide a permanent record of the locations of markers (called "landmarks" or "monuments") erected by the survey along the border.

—border. [FIGURE] [insert figure 4 near here] [insert figure 5 near here] [insert figure 6 near here] [insert figure 7 near here]

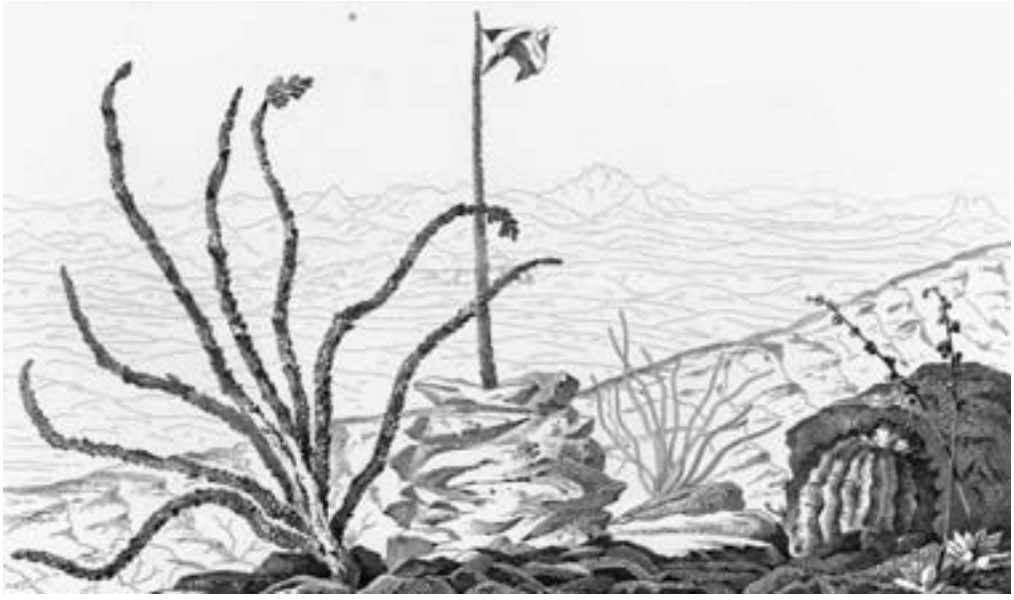

FIGURE 3 Arthur Schott, *View from Monument No. 17, Looking East towards Monument No. 18,* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

FIGURE 4 Arthur Schott, *View from Monument 18, in the Puerto de la Sierra del Pajarito, Looking West towards Monument 17, on the Cerro de Sonora,* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

FIGURE 5 Arthur Schott, *View from Monument 18, in the Puerto de la Sierra del Pajarito, Looking East towards Monument 19,* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

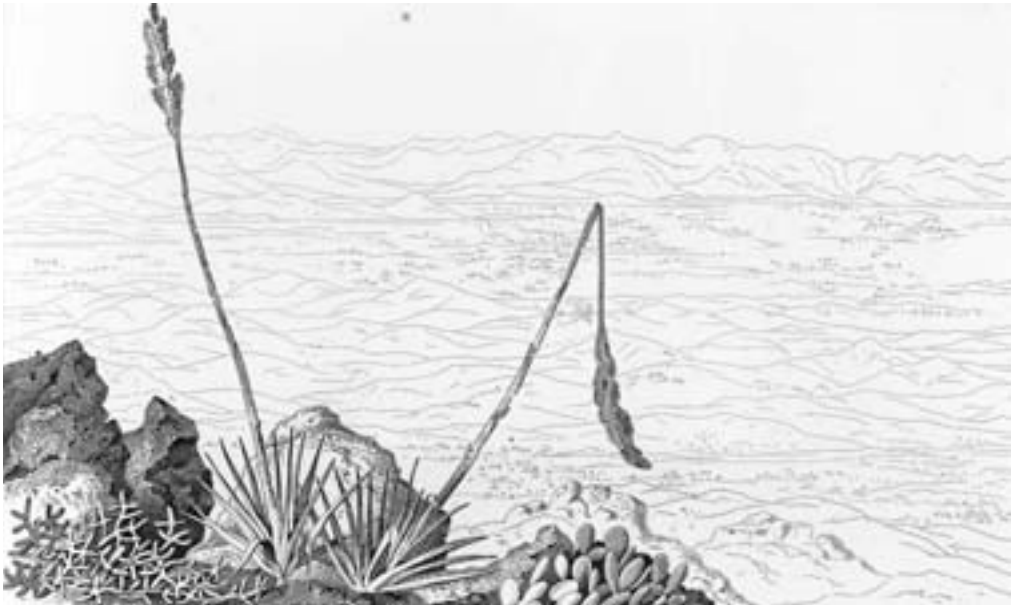

FIGURE 6 Arthur Schott, *View from Monument No. 17, on the Cerros de Sonora, Looking West towards Monument No. 15, on the Sierra del Pozo Verde,* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

FIGURE 7 Map of the U.S.-Mexico Border.

Although both sets of views could presumably have assisted the government in locating monument sites, the style of the views by Schott had surplus functions. With respect to his position as a Prussian exile struggling with inhospitable circumstances, it negotiated certain schisms within the survey and his practice. With respect to the position of Emory, who was under pressure from Congress to deliver welcome results from a troubled survey of a controversial border region, it offered signs of legitimacy, reassurance, and accomplishment. Why and how these illustrations simultaneously fulfilled these disparate purposes is the crux of the argument that follows.

THE EMORY REPORT AND ITS BOUNDARY VIEWS

Expansionist ambitions fueled the early history of U.S. geographical and geological surveys. Path-breaking expeditions across the continent, including that of Meriwether Lewis and William Clark (1805–7) and Stephen Long (1819–20), explored western rivers primarily to amplify the government's control over the fur trade. As the first decades of the nineteenth century passed, the shift in transportation from water to rail, the massive slaugh-

ter of beaver, and the territorial expansion of the nation ushered in a new set of priorities. In 1838, Congress established the Corps of Topographical Engineers within the Department of War to facilitate a new era of economic development. By the 1840s, the federal imperatives had become the selection of a transcontinental railroad route and the determination of the national borders in the wake of conquests and purchases. To this survey agenda, the discovery of gold in California in 1848 added the task of locating and facilitating access to valuable mineral deposits.[3]

When the secretary of the interior ordered Emory to take charge of the U.S.-Mexico boundary survey in 1854, the major inherited an enterprise responsive to all of these new concerns but charged primarily with determining the exact territorial consequences of the war between the United States and Mexico and the negotiations that had followed it.[4] The annexation of Texas in 1845, the Treaty of Guadalupe Hidalgo of 1848, and the Treaty of 1853 (also known as the Gadsden Purchase) greatly expanded the land holdings of the United States and altered its southern border. To prevent future disputes, the two countries agreed to determine and mark a new, more exact boundary between them. The Treaty of 1848, which ended the war, stipulated as follows: "In order to designate the boundary line with due precision, upon authoritative maps, and to establish upon the ground landmarks which shall show the limits of both republics . . . the two governments shall each appoint a commissioner and a surveyor, who . . . shall meet at the Port of San Diego, and proceed to run and mark the said boundary in its whole course to the mouth of the Rio Bravo del Norte."[5] Between 1848 and 1856, a joint commission, headed at its conclusion by Emory of the United States and José Ylarregui Salazar of Mexico, employed survey parties along the boundary and specialists elsewhere to fix the new line.

The language of the treaty made the designation of the boundary a divided task. The joint commission determined the line within the archive by producing a series of fifty-four sectional maps and within the border region by erecting a series of monuments on the ground. No monuments were needed on the stretch of the boundary that followed the course of the Rio Bravo or on the small stretch that coincided with the Colorado River near the California border. But for the hundreds of miles separating what is now the city of El Paso and the Pacific Ocean, an interval of the boundary consisting almost entirely of straight lines across open terrain, markers were necessary to make the exact border known. To fix these "mere imaginary lines," as one federal executive called them, the survey erected fifty-two monuments, separated by distances varying from one-eighth of a mile to nearly ninety miles, between El Paso and the coast.[6] The commission constructed the monuments in a variety of forms and materials. With the exception of a marble pyramid on a pedestal marking the initial point of the boundary on the Pacific, the monuments consisted of cast-iron markers on pediments, pyramids of cut stone laid in cement, pyramids of closely laid stone without cement, and small, simple cairns.[7]

By producing views of the boundary, the commission sought to surmount the trou-

blesome division within its mandate between maps and monuments. As authoritative records of boundaries, maps had the advantages of being compact, portable, and easily reproducible. Both commissioners were professionally invested in cartography and sought to make their maps as accurate and definitive as possible. But the law of boundary disputes, as Emory surely knew, subordinated maps to markers on the ground.[8] Maps of the boundary, however convenient, would always be detached from the divide in question and prone to problems of interpretation. Even if calibrated to a small scale, they would leave those in a region with too little exactness for resolving disputes. Moreover, measurements of latitude, longitude, and azimuth were liable to change over the years, especially as the technology and techniques of geographical surveying improved. A monument, by contrast, publicly recorded a final judgment on the earth itself. For these reasons, courts dealing with boundary disputes traditionally gave priority to markers on the ground and patterns of acceptance of an actual boundary over maps or other graphic records. For the joint commission, each monument represented an act of official interpretation regarding the correspondence between cartographic coordinates along the boundary and an actual site on the planet. As one historian has concluded, "The true boundary was the boundary marked on the ground."[9]

Although the evidentiary strength of boundary markers stemmed from their fixed location and concreteness, so did their physical vulnerability. Whereas the original boundary maps could be stored in archival vaults and reproduced readily, the markers were unique, out in the wilds, subject to vandals, landslides, and other dangers. Even while the survey was ongoing, Salazar claimed to have personal knowledge that "some of the monuments erected by Mr. Emory [had been] destroyed and others mutilated by the Indians," and both commissioners feared that incidents of damage would persist.[10] Many years later, in 1883, Lieutenant Thomas W. Symons of the Army Corps of Engineers, having made a reconnaissance of the boundary for Congress, confirmed the fears of the commission in this regard: "Some of these monuments are gone entirely; some few of those that remain are in good condition, but by far the greater number are dilapidated and injured to a greater or less degree. Of some, merely traces remain, which are fast becoming obliterated."[11] Symons reported that six of the nineteen monuments erected in the stretch of the border covered by Schott's views had, due to various causes, completely vanished.[12]

Emory anticipated this problem and included the boundary views in his report to cope with it. Although the Gadsden Purchase did not alter the southern boundary of California, which had already been surveyed, it changed the boundary from the junction of the Gila and Colorado Rivers to the Rio Grande, thus offering Emory an opportunity to produce a series of views across most of the border west of El Paso. The views were a way to bridge from the maps to the monuments, from the territorial line as a graphic fact to the territorial line as a string of locations on the earth.[13] Their express function was to "perpetuate the evidences of the location of the boundary, in the event of the Indians re-

FIGURE 8 John Weyss, *View from the Monument Marking the Terminal Point of Boundary on Parallel 31° 47'—Looking South along the Meridian,* engr. William Dougal, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

moving the monuments erected on the ground."[14] Their work lay in the gap between scheme and materiality that both defines and disables the archive.

Separated in the report by twenty pages of text and four interspersed chromolithographs, the two sets of boundary views each take up sixteen pages, with two views on each page.[15] William Dougal of Georgetown engraved the views by Weyss, which are numbered one through thirty-two (fig. 8). Of the views by Schott, numbered thirty-three through sixty-four, the engraver J. D. Smillie of New York rendered fourteen, while Dougal produced the remaining eighteen (fig. 9). Weyss and Schott evidently reviewed proofs of the engravings and made corrections.[16] The correspondence records also suggest that Emory and his staff may have preferred the engraving of Smillie to that of Dougal.[17] The hachure of Dougal comprises straighter, longer, and more uniform lines than those employed by Smillie, whose renderings, largely as a consequence, bear greater subtlety of texture.

—texture. [FIGURE] [insert figure 8 near here] [insert figure 9 near here]

Each illustration, accompanied by a caption identifying the monument in question, specified a site by the prospect it afforded. The formula was a simple one: if one were to stand in a place that proffered *this* particular view, then one would stand at such and such a location on the boundary. For example, if one returned to the vicinity of "Sierra de las Tinajas Altas" and hunted about, one could presumably find the spot offering the same prospect as that depicted in view number fifty-nine and thus be assured that this was the

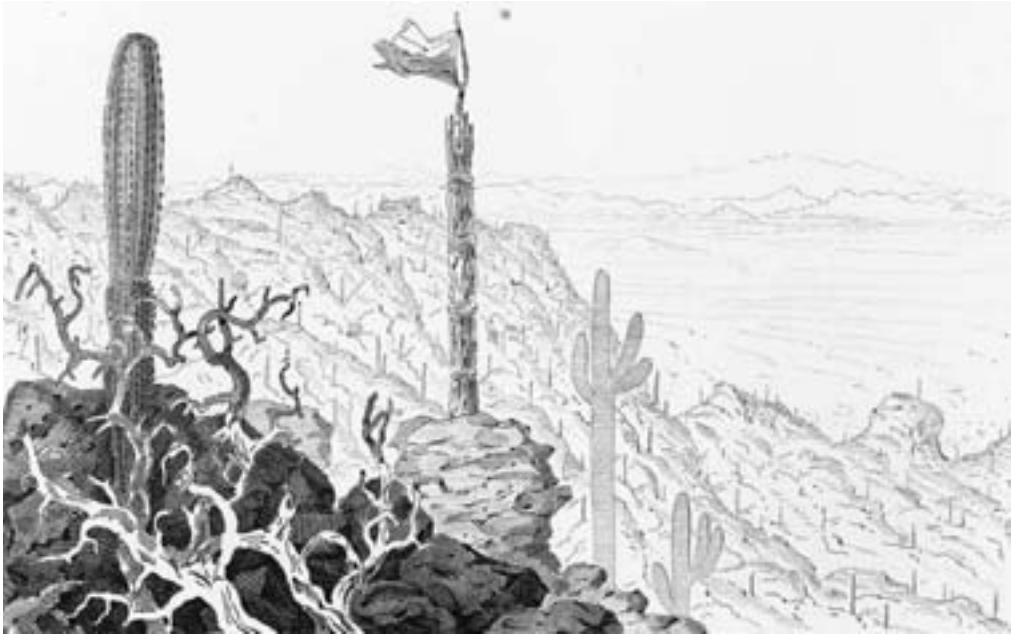

FIGURE 9 Arthur Schott, *View from Monument No. 10, Looking West towards Monument No. 9*, engr. William Dougal, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

original site of boundary marker number four and the place to reconstruct that marker if necessary (fig. 10). This function demanded that each view identify a unique prospect in the vicinity of the point on the boundary being recorded. Schott probably rendered the background contours with the use of a camera lucida, an apparatus featuring a small lens that converts the act of drawing to one of tracing. Although I have come across no explicit evidence in support of this proposition, there are multiple mentions of a camera lucida in the survey's equipment receipts.[18] In any event, Emory's office insisted that the engravers "follow exactly the originals especially in reference to the dotted lines representing very distant mountains."[19]

[FIGURE] [insert figure 10 near here]

Many of the views defined not only the location of a boundary marker as a prospect but also the path of the boundary as a line of sight. In the views by Weyss, a flag in the background indicated the course of the boundary from the vantage point of the viewer (fig. 8). That is to say, a virtual line connecting the flag to the bottom center of the image (or to the boundary marker in question, if one appears in the foreground) approximated

FIGURE 10 Arthur Schott, *View from Monument No. 4, Looking West towards Monument No. 3,* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

the line of the boundary. In the views by Schott, an asterisk in the sky evidently performed this indexical role (fig. 3).[20] Most of the views in both sets, therefore, operated as double indexes, pointing to the viewing position from the horizon by offering a distinctive prospect, and pointing along the line of the boundary toward the horizon by providing a background marker. These views thus determined two points that defined the boundary as a line extending into illusionistic space.

The views constituted an ingenious solution to an unusual problem. In the mid-nineteenth century, long straight lines were a rarity among international boundaries. Although the borders of several American states included such instances of geometric purity, most international boundaries, including those of Europe, followed rivers, mountain ranges, or other natural features. The boundary that Emory was responsible for recording was thus conspicuously modern and posed a distinctively modern conundrum: how to bring a stark geopolitical abstraction, an "imaginary line," into some fixed correspondence with the earth.[21]

The survey's ingenious but simple solution to this problem entailed the production of

a new variety of picture. The boundary view ostensibly demanded the complete subordination of iconicity to indexicality.[22] By the strict terms of the task, the strategies of mimesis, ranging from the careful delineation of foreground features to the representation of distance as proportional diminution, functioned only to define a point on the earth. These views were a global positioning system, and pictorial illusionism was simply a means of getting the coordinates correct. The primary subject matter of the views was not what we see within them but the viewing positions they defined.[23]

In carrying out this ingenious solution, the parties involved faced a host of perplexing questions. How were the views of the marker sites to be composed and rendered? What models were appropriate? What kind of picture could best do the job? Given the unusual demand on the boundary views, the striking contrast between those drawn by Schott and those by Weyss should come as no surprise. Emory himself probably had no clear idea of how such views should look.

The distinctive approach to this challenge crafted by Schott and accepted by Emory begs more historical explication. The remainder of this chapter will tackle two questions: first, what made this pictorial solution both plausible and attractive to Schott?; and second, what prompted Emory to give it his approval? This divided approach will yield strikingly divergent answers.

A SPINY FIXATION

Schott was one of several Europeans who came to the United States in the nineteenth century to take part in the ongoing mapping and inventory of the new world. The history of surveys of the West is particularly rife with the work of Prussian draftsmen. Friedrich Egloffstein, H. B. Möllhausen, Carl Schuchard, and Schott all produced memorable and widely circulated survey pictures. The cultural formation of these men and their encounters with not only unfamiliar geographical regions but also an unfamiliar government and society informed their pictorial work in subtle ways.[24]

Schott was the son of Albert Schott, a liberal member of the lower house of the Diet of the German state of Württemberg. The elder Schott and the liberal poet Ludwig Uhland played key roles in the thwarted fight for liberal reforms during the revolutionary moment of 1848–49. Although by no means wealthy, the younger Schott was broadly educated in an aristocratic tradition; he was a published poet, an accomplished musician, and a student of natural history, especially botany. As a young man, he pursued a fashionable interest in the so-called primitive: employed as an overseer for a royal estate in Hungarian Banat in the late 1830s and early 1840s, he collaborated with his brother Albert on a compilation of Walachian folktales.[25] In 1850, at the mature age of thirty-six, Schott came to the United States to explore remote regions in the manner of Alexander von Hum-

boldt and to escape the oppressive political turn in the German states. In 1851, he befriended the Princeton botanist John Torrey, who had been advising Emory on botanical matters. Torrey persuaded the major to hire Schott as an assistant.

Like Egloffstein and Möllhausen, Schott possessed many skills, and his duties on the boundary survey were exceptionally varied. Although his primary responsibility was as a draftsman, and his name appears on many survey maps, he also collected botanical, geological, and zoological specimens, including many fossils, drew landscapes, views, and American Indians, and later wrote a section on geology for Emory's report.[26] Schott even found time to write a colorful diary, excerpts of which appeared in the Stuttgart periodical *Das Ausland,* and bits of poetry and prose that appeared in *Neu-Braunfelser Zeitung,* the newspaper of a German community in Texas.[27]

Schott's professional commitment and manifold skills were crucial to Emory, who took over the survey when it was short on both money and expertise.[28] A previous commissioner, John Russell Bartlett, had misused funds, hired unqualified personnel, and run the operation into the ground. As a result, Emory was desperate for capable employees willing to work under poor conditions and an unstable pay schedule. The highly educated, financially needy, and scientifically committed Schott was a prime candidate. Within months, Emory had put Schott in charge of a surveying party. At the time, the major admitted to his principal lieutenant: "Mr. Schott is the only person who I find here qualified and available."[29]

Within his broad range of competence and interests, Schott came to prize botany especially. Prior to joining the survey, Schott helped Torrey produce illustrations of botanical specimens for a Corps of Engineers report on the valley of the Great Salt Lake and became acquainted firsthand with the narrow focus and taxing dedication demanded of an emerging class of professional scientists.[30] While working for Emory, Schott became increasingly devoted to botanical investigation in the field, assembling an impressive collection of specimens. Between 1853 and 1857, Schott and George Engelmann, the Saint Louis botanist and expert on cacti, regularly exchanged long letters that discussed topics ranging from personal vexations to technical matters. In an early letter to Engelmann from the border region, Schott complained that "the course of my official professional activities unfortunately does not permit me to pursue my favorite occupation of botany."[31]

Schott routinely expressed ire with the demands and priorities of the survey, and not without cause. Emory reaped the benefits of Schott's broad expertise but often paid him only for his topographic work. In late 1851, he wrote to Schott: "The duties which Lieut. Michler will assign you will occupy your first attention, but should you have any leisure moments, I desire you will continue your sketches and collections of Natural History."[32] Schott complied, pursuing his botanical and geological collecting and cataloging on his own time, but it was a burden he increasingly resented.[33] At one point he complained to Engelmann: "Above all, my dear sir, I wish you would consider my endeavorings a little

different of those performances of my friends Drs. Bigelow and Parry, who besides Botany and Geology did not have any thing to do but sometimes prescribe a solvens, a tonic or purgative for a generally very healthy crew."[34]

Although Schott lauded the democratic ideals of the United States, the nation's ethos evidently tested his habits and values. He disparaged the "bustle of money" that characterized American urban life and claimed to feel less alone in the wilderness.[35] By his account, the camaraderie of survey work stemmed more from his sympathy for plants and other wild things than from the presence of his coworkers.[36] His letters repeatedly asserted his disdain for the latter, complaining of "their rough customs and manner and for their professional idle[ness] and laziness."[37] Trained in a Swabian intellectual circle that entrusted science to the cultivated disinterest of cultured men, Schott routinely bridled at the survey's bureaucratic organization and the ways in which it insistently framed matters of science to accord with practical and commercial ends.[38]

Schott expressed particular vexation concerning the production of Emory's report. Like earlier reports intended for American readers, the report is split between, on the one hand, expedition narrative and geographical description and, on the other, taxonomy. The first volume features a personal account by Emory of the survey and general descriptions of the country traversed and its inhabitants, followed by an account of the geology along the line. The second volume, issued in 1859, addresses the zoology and botany of the border. Pursuant to survey protocol, Emory intended the first volume to be the principal representation of the survey and its results for a general audience and for those having a keen interest in practical affairs. The work of the second volume, he said, "however valuable to Naturalists and Men of Science is of no popular interest, and should be printed only for the use of Societies and savans."[39] In keeping with this understanding, Congress ordered the printing of fifteen thousand copies of the first volume and only two thousand copies of the second.

Although Emory characterized the distinction between the first volume and the second as a limit of the "popular," in fact the volumes separated the profitable or practical from the academic. The first volume contains not only colorful narratives but also reports on meteorology, geology, and paleontology and an extensive account of astronomical and geodetic work, accompanied by many tables of latitudes, longitudes, and azimuths. The inclusion of these arcane and quantitative matters in the first volume was quite deliberate. During the production process, when it seemed that the report on geology and paleontology would be delayed, Emory wrote to the author, Professor James Hall: "I regret your work will not be ready to go in the First volume. It will be smothered up in the second with reptiles, cacti and the devil knows what all."[40] In the end, Hall's report did appear in the first volume, even though many of its technical passages were inaccessible to the general reader. Whereas naturalists were curious about reptiles and cacti, practical men were more interested in the future of settlement and industry, whether mining or

agriculture.[41] The first volume's cartographic, meteorological, and geological information, however technical and difficult to comprehend for the nonspecialist, nonetheless pertained to the immediate needs of capital.[42]

The preparation of the report thus exemplified priorities that Schott railed against. Emory's disdainful reference to the possibility that Hall's report might be "smothered up" with "reptiles, cacti, and the devil knows what all" betrayed the low priority he accorded scientific investigations that lacked immediate commercial promise. Despite a personal interest in cacti and a significant record of discovering new botanical species, Emory aligned himself with capitalists and their congressional allies by treating such matters as incidental to his survey.[43] Although he showed great concern for the contents of the first volume, he was less troubled, according to Schott, when portions of the second were subjected to compromise. In a letter of 1858 to Torrey, Schott wrote: "The curtailing of the Boundary Report is very annoying but it cannot be helped, after the man who ought to keep the publication in his hands has deserted it, after seeing printed his first volume."[44]

Not only did Emory relegate scientific taxonomy to the second and subordinate volume of the report, he also insisted upon a modern division of labor in the production of the report illustrations. In general, authorship of the report was split between those who served in the field and those who analyzed specimens and data in government or private offices.[45] In particular, Emory had a draftsman under the supervision of Engelmann finish the sketches of cacti that Schott had made in the field. Schott complained of this to Torrey: "I am at present a little angry with the Maj. and feel mortified that he now abuses my sketches. He is giving them to another draughtsman, who may have alike abilities with me but who never was out in Texas and can for this reason not be able to finish these sketches as they ought to be done. I lose in this way my interest for the matter."[46] Treating scientific tasks like commercial labor violated the integrity of human experience that Schott, educated in an older system of inquiry, evidently regarded as fundamental to his vocation. It was a tenet of the Romantic culture of science in which Schott had been trained that true knowledge only derived from direct experience. According to this premise, only an expert who encountered the specimens in the field could sketch them adequately.

More prosaically, by contracting out the finishing of the sketches, Emory diminished the credit that Schott would receive for the final illustrations. Schott's anxiety in this regard came through plainly in a diplomatic letter he wrote to Engelmann soon after learning of Emory's decision:

> I think it best now to write in English as our written intercourse will probably have some official reference. After your letter I went immediately to Maj. Emory and he wrote a note to you. I asked also for those of my sketches which I have made about Cactus's [*sic*] on the ground and were afterwards placed into his possession. I have them now in my hands together with others not referring to Cactaceae. I wish to finish them myself thus far as to enable you to form a distinct idea about the specimens represented

> by them. I have no doubt you will give me the proper credit . . . as collector and also as draughtsman, wherever my drawings or sketches should suffice as a faithful representation of the plant. Now, my dear Doctor, give me only a few days time and I shall send you sketches to begin with your engravers business. I am so anxious to procure for you good drawings of the plants for the work where they shall be published in, shall become one of the finest works ever published in this country. It is a matter of course that the drawings of details can be made only under your eyes or even by yourself.[47]

By switching at this point in his correspondence with Engelmann from German to English, Schott acknowledged the formal turn in their relationship that this new division of labor had established. Although this letter exhibits the deference common to what James C. Scott calls "public transcripts," Schott's words betray his concern about receiving credit for the final drawings and his determination to finish them with his own hand to the extent possible.[48]

Schott's anxiety proved well founded. The final specimen illustrations of cacti bear the names of only the engraver and P. (Paulus) Roetter, a draftsman working for Engelmann in Saint Louis.[49] Moreover, although Schott specifically asked Engelmann for the privilege of making the final drawings of "Cactuses of larger size as C. giganteus," Engelmann had Roetter draw a picture of *Cereus giganteus* for the frontispiece of the second volume.[50] To make matters worse, Roetter based his drawing on a sketch by Möllhausen.[51]

The style that Schott fashioned for the boundary views resisted the bureaucratic priorities that irked him. It allowed him to supplement the topographic function of the views with a taxonomic concern for desert plants and to get his own botanical sketches into the report. After his work in the field was complete, Schott wrote to his American mentor, the Princeton botanist John Torrey: "For the present I am busy finishing a series of scenic views taken on the different stations on the Boundary line. To make these landscapes more valuable and worthy for science I pay particular attention to the execution of the foregrounds, which are fitted out each one with some peculiar plant indigenous to the country. I wish you could see some of them. The most striking features in this regard are offered by the Cacti, which deserve more special attention on account of their being almost new in the representation of landscapes."[52] Having expressed displeasure with the delegation of responsibility for the drawing of certain of his specimens to other parties and with the deferral of botanical illustration to the subordinated second volume of the report, Schott inserted a smattering of his own botanical sketches into the first. By lining the foregrounds of the boundary views with plants of various types, he cleverly took advantage of the practical necessity of the views to put his taxonomic sketches before a wider audience. He finessed a clash of scientific cultures and made work central that the survey had marginalized. His correspondence betrays pride in having devised this solution to the challenges besetting his practice, and afterward he was solicitous of Torrey's opinion of the pictures.

FIGURE 11 Arthur Schott, *Las Isletas—Falls of Presidio de Rio Grande,* engr. R. Metzeroth, c. 1855. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Widener Library, Harvard University, Cambridge.

Although the boundary views offered Schott an especially propitious opportunity to outflank the official priorities and delegations of the survey, he attempted similar stratagems in producing other illustrations for the first volume of Emory's report. For example, in a more conventional landscape engraved after a drawing by Schott of the Rio Grande, an unremarkable background of river and bluffs gives way to a foreground parade of botanical entities that spans the picture's width (fig. 11). Each plant and tree receives the individuated attention habitually bestowed by the botanical specialist, as if they constituted a line of specimens assembled on the riverbank. While the picture as a whole could satisfy the popular curiosity that Emory sought to address, it included taxonomic information that botanical experts alone might prize.

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[FIGURE]
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figure 11
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Although Schott skirted certain bureaucratic preferences by inserting his botanical

sketches into the boundary views, the views pictorially reproduced the cleavage between local practice and remote authority, private obsession and public enterprise, that fundamentally structured Emory's survey. The background contours marked out the realm of official value determined by distant powers, while the foreground plants delineated the donated passion of Schott's own localized practice. The absence between them of a distinguished middle ground, the traditional landscape space of connection and dwelling, structurally posited the ultimately nonnegotiable division within the survey archive between a practical government program and an idealized commitment to particularity.

Ostensibly designed to fix and define the location of a generic viewer, the boundary views thus offered a perspective belonging to Schott himself. Like other survey employees, he complained repeatedly that he had no clear picture of how his efforts in the field linked to the survey program at large. He wrote to Torrey: "What now farther is to be done and in what employment I shall enter is dark before my eyes."[53] Schott applied himself to his daily tasks, working from point to point, with scant notice of what the bureaucracy that employed him would do next. Directives, authorizations, and paychecks issued from his superiors with distressing haphazardness. Schott complained on one occasion that Lieutenant Michler had "kept me intentionally in perfect ignorance about the whole organization of the survey party."[54] Professing incapacity to make sense of the intermediate space of the survey as a social organization, Schott attended to his quotidian duties. This bounded attention has a pictorial analogue in the bifurcation of his views between a scrutinized but incidental foreground and a sketchy but authoritative remoteness. The views abide by the oppressive demand of so much work under bureaucracy to attend only to the immediate tasks and materials at hand and to content oneself with a thin apprehension of the larger operations beyond.

This account of Schott's syncretic use of conventions in the boundary views may suffice as a first-order explanation, but it leaves several questions unanswered. Even if the cleft between his commitments and the programmatic imperatives of the survey fostered a desire to introduce botanical illustrations into the first volume, it does not in itself explain why his hybrid handling of the views struck him as possible or acceptable. If, as Foucault has suggested, the archive functions as a historical limit on possible statements, then no such a limit can be overcome by mere desire. Moreover, the account thus far of Schott's innovation leaves unanswered the questions of why his specimens appear so animated and why his pictorial elements cohere in such a compelling manner. The boundary views are not merely bifurcated areas of distant contours and proximate plants, but syntactical, integral scenes of representation that bind vibrantly together flags and stumps, stems and stars, boulders and cacti.

Addressing these issues requires a deeper inquiry into the clash of cultures that Schott's work negotiated. In particular, it requires tending to the habits that Schott brought to his archival practice and how he adapted those habits to his peculiar circumstances. By the

time he began working for Emory, Schott was a middle-aged man with an extensive set of skills. Given that the task of making the boundary views could not be served by any ready set of pictorial conventions, the question arises: to what conventions would he have gravitated? Of what models would he have availed himself?

The most obvious model for the boundary view was the topographic sketch. The practice of making accurate, minimally embellished topographic views has a long history and became particularly prevalent in northern Europe in the middle of the eighteenth century to illustrate popular travel books. As Barbara Stafford has described, topographic views traditionally embraced a divided optic: "There are two major modes of perception inherent in the topographical approach. The first represents a fondness for wide—either shallow or deep—panoramas. These ignore the foreground, leaping over its relative emptiness to give an impression of distance and remoteness to the landscape and the objects it contains. The second mode embodies a passion for minuteness and contracted sight that is consubstantial with the meticulous recording of the 'look' of strange localities. This foreground focus owes to the tradition of naturalist-artists who carefully absorbed the appearance of the particularity situated before them."[55] By the middle of the nineteenth century, a particularly systematic branch of topographic sketching had emerged within the military. Its conventions allowed a draftsman to record the salient features of terrain quickly and to represent them in a readily apprehensible way. Training in topographic sketching was integral to army education, and Emory himself would have learned the art at West Point. The bifurcated optic of the topographic sketch presumably helped army commanders ascertain the challenges and opportunities posed by both the immediate environment (brambles, loose rock, vegetation offering cover) and the overall topography within the view. No doubt this conventional structure continued to be informed by aesthetic as well as strategic considerations, the articulated foregrounds satisfying popular expectations for proximate objects of visual interest.[56]

Although the effect has often gone unnoted, the military practice of topographic sketching systematically pushed pictorial representation toward the combining of discrete signs. The need for speedy recording and ready comprehension led the army to devise shorthand means of representing sites in a cartographic manner. It also biased topographic practice against the kinds of visual nuance, continuity, and integration favored by the pictorial tradition of high art and even against the meticulous particularity associated with more popular forms of topographic rendering. Seth Eastman's *Treatise on Topographical Drawing,* the standard American reference on the subject in the years preceding the Civil War, supplied a guide to topographic motifs as well as geographical and military signs (figs. 12, 13).[57] Strictly practiced, topographic sketching consisted largely of putting these discrete elements into a representative order.

[FIGURE]
[insert figure 12 near here]
[insert figure 13 near here]

In making his boundary views, Schott tailored the conventions of topographic sketching to both his unusual task and his personal agenda. By reducing the background to spare

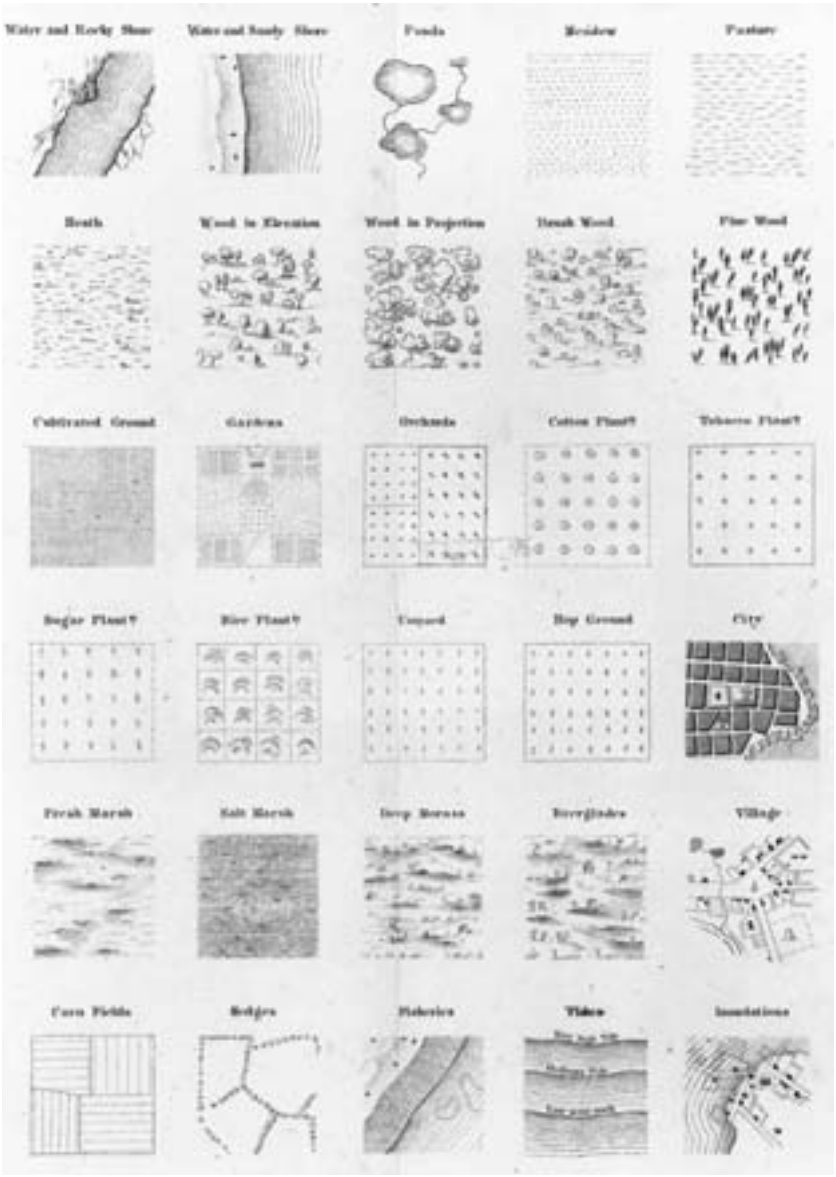

FIGURE 12 Seth Eastman, untitled, engr. J. F. E. Prud'homme. Plate from Seth Eastman, *Treatise on Topographical Drawing,* 1837. Cabot Science Library, Harvard University, Cambridge.

FIGURE 13 Seth Eastman, *Geographical Signs*. Plate from Seth Eastman, *Treatise on Topographical Drawing*, 1837. Cabot Science Library, Harvard University, Cambridge.

FIGURE 14 Arthur Schott (?), *Section on the North Side of the Cerro de Sonora,* c. 1855. Illustration from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

contours, he accommodated the fact that geographical location and not troop movement or supply transport was the official concern. Replacing a boundary marker would require no knowledge of ground cover or incidental vegetation but only of the presumably enduring outline of the local topography. In other words, contour, not surface, was paramount. From this perspective, the fussy attention to background shading and texture in the views by Weyss appears a useless vestige of pictorial tradition, and the spare delineation of Schott, a more modern and radical adaptation to exigency. In giving the conventions of topographic sketching such a tweak, Schott probably drew upon his experience producing geological sketches that distilled forms to delineated profiles (fig. 14).[58] To advance his personal agenda, Schott eschewed any codification of plant types. Although his assembly of discrete motifs into a practical record of place accorded with the prescriptions of Eastman's manual, the conspicuous individuation of his botanical motifs did not.

[FIGURE] [insert figure 14 near here]

By combining this emphasis on distant contour with a specialized concern for botanical specimens, Schott exaggerated the conventional split within topographic sketching between near and far. His boundary views push the bifurcation at both ends: the nearest pictorial elements, painstakingly delineated, crowd up against the picture plane, while behind them, the picture makes an abrupt transition to stark outlines of distant morphology. His views thus widen the topographic split described by Stafford to a puzzling extreme.[59] The views by Weyss offer a more conventional counterpoint. In them, the detailed focus of the foreground recedes more gradually into the picture space, and the backgrounds are less schematic.

Although the topographic sketch offered Schott a basic set of precepts from which to work, he brought other habits of practice to his task. In particular, traces of German Romanticism surface time and again in his pictures and prose. [60] His correspondence ideal-

FIGURE 15 Emil Lugo, *Landscape with Oak Tree under Stormy Sky,* c. 1856. Watercolor, pencil, and gouache on cardboard, 13 ½ in. by 17 in. Staatliche Kunsthalle Karlsruhe.

izes organic dynamism and morphogenesis as cosmic principles in a manner associated with the *Naturforschung* (investigations of nature) of Friedrich Schelling (1775–1854) and Henrik Steffens (1773–1845).[61] In keeping with this affinity, his sketches endowed each botanical specimen with signs of the liveliness and variety of organic process. The animated, tentaclelike branches and twigs of his stunted trees correspond to the arboreal forms found in the work of German contemporaries, such as Emil Lugo (fig. 15).[62]

—fig. 15). [FIGURE] [insert figure 15 near here]

According to prominent strains of Romantic thought and practice, organic processes of formal development were fundamental to botanical understanding and to the meaning of plants in the cosmos. To understand these processes, one had to experience them firsthand. This explains further why Schott objected to and resisted Emory's attempts to

contract out the work of drafting specimens to specialists who had never encountered the plants in the field. Schott complained in a letter to Engelmann: "No doubt somewhat like can be made by a draughtsman according to a good description but the result will invariably be an artificial plant, whilst the real originals having irregularities and deviations from the type, which usually escape before the eye of science. This is the cause of all those stiff, unnatural looking representations of most of the plants in scientific works."[63] Not present before the living specimen, the office draftsman would, according to Schott, inevitably gravitate back to a schematic representation of type rather than produce a vivid and convincing transcription.[64] Committed to retaining the vegetal irregularities and dynamic processes to which he deemed himself especially sensitive, Schott sought not only to retain the peculiarities of individual plants but also to represent the process of morphogenesis and decay. This was perhaps especially true in the case of the boundary views. To Engelmann, he wrote: "I am charged by Maj. Emory with the finishing of some 36–40 sketches of landscapes to illustrate the topography of the Boundary line. In these plates I shall take occasion to make the foregrounds lifelike by introducing all those indigenous plants which appear most striking in the survey of the country. You will easily understand what a prominent part the Cacti will take in those sketches. By frequent repetitions I will try to give the features and characteristics of almost every one through the various phases of their growth." The several sketches featuring cacti in various degrees of maturation and decline exhibit the results of this Romantic ambition.

Schott's approach to botany emphasized not only the dynamism of morphogenesis but also the geographic distribution of plants. Alexander von Humboldt, whose writings on the biota of the New World undoubtedly informed Schott's own aspirations, had a productive obsession with determining the ranges of plant species and devised graphic displays that mapped these ranges across regional topography.[65] Schott, by populating the foregrounds of his boundary views with plants indigenous to the desert areas represented, ingeniously recombined in Romantic fashion two components of geographical inquiry that the boundary survey's framework of specialization had worked to separate. Whereas Emory had officially consigned botany and topography to different volumes of his report, Schott's views systematically depicted them together.

The startling cleft in the boundary views between near and far corresponded not only with the conventions of topographic sketching and the structure of the survey, but also with a Romantic pictorial inclination to collapse the continuum between the vast and the tiny (fig. 16). The spatial divide in the boundary views of Schott recalls, for example, a passage from Joseph Koerner's account of Friedrich von Ramdohr's 1809 review of Caspar David Friedrich's *Cross in the Mountains:* "Trapped within a play between proximity and distance, familiarity and estrangement, presence and absence, the microscopic and the colossal, we ourselves become discontinuous, able neither to enter into the represented world, nor to observe it as a whole, from some standpoint *sub specie aeternitatis*."[66] While

[FIGURE] [insert figure 16 near here]

FIGURE 16 Caspar David Friedrich, *Mountain Landscape,* 1803. Sepia, 4¾ in. by 7¼ in. Goethe Nationalmuseum, Weimar, Germany.

Friedrich in this painting brought the play of proximity and distance into the single motif of the mountain, Schott took the less radical step of figuring such discontinuity within a view as a whole.

The Romantic predilection for discontinuous space evidently informed the work of other survey picture makers, including other Prussians who served on expeditions in the 1850s. Views such as Schuchard's *South End of Lake Guzman near Lake Santa Maria,* made for Andrew Belcher Gray's 1854 survey of the thirty-second parallel, and Möllhausen's *Schluchten im Hoch-Plateau und Aussicht sauf das Colorado-Cañon,* made on the basis of experiences on the 1857 Ives expedition on the Colorado River, partake of an optic polarized between near and far (figs. 17, 18). To accord with the special priorities of survey work, these pictures exploited the conventional split within the topographic imagination. They divided attention to the land between the remoteness of the cartographic display, which shrank vast pages to a page, and the immediacy of the specimen image, which magnified particular objects for scrutiny.

—
[FIGURE]
[insert figure 17 near here]
[insert figure 18 near here]

Nonetheless, Schott's views stand out from the work of his peers. The two pictures by

FIGURE 17 Carl Schuchard, *South End of Lake Guzman.* Plate from Andrew Belcher Gray, *Survey of a Route on the 32nd Parallel for the Texas Western Railroad,* 1854. Transportation History Collection, Special Collections Library, University of Michigan, Ann Arbor.

Schuchard and Möllhausen are anomalies within the larger productions of each artist; no picture maker other than Schott completes a series of views as bifurcated as his.[67] Moreover, the view by Möllhausen and those by Schott differ critically with respect to the proffered basis for the pictorial divide. In the former, the divide corresponds to the topographic fact of the rim of the canyon, which runs along the bottom of the picture. It serves, in the manner of a conventional device of the sublime, to amplify the precipitousness of the foreground terrain and the vastness of the gloom beyond. In the views by Schott, the divide belongs not to the earth but to the visual field itself.[68] If sublimity is at play, it attaches less to the unfathomableness of nature than to insuperable divisions within the survey optic. In this sense, the pictorial discontinuity of the boundary views is closer to that of Friedrich's *Cross in the Mountains* than to that of the picture by Möllhausen.

The hieroglyphic quality of the boundary views by Schott also finds precedent in Romantic art and science. Like Schott, Friedrich often composed his pictures as elusively syntactical arrangements of discrete pictorial motifs. Although working under starkly different circumstances, the two picture makers may have drawn from the same cultural well. Schott's early investigations of continental folklore would have acquainted him with the profusion of emblem books and almanacs from which Friedrich probably derived his hi-

FIGURE 18 H. B. Möllhausen, *Schluchten im Hoch-Plateau und Aussicht sauf das Colorado-Cañon.* Plate from Möllhausen, *Reisen in die Felsengebirge Nord-Amerikas bis zum Hoch-Plateau von Neu-Mexico,* vol. 2, 1860. Beinecke Library, Yale University, New Haven.

eroglyphic approach.[69] In addition, the compositions of both practitioners partook of a Romantic notion concerning the dynamic interconnectedness of natural and social entities. The writings of Kant and Goethe on morphotypes anticipated the discovery of unifying structures and subtending patterns of organic development across species, and Romantics seized on vegetable growth in particular as paradigmatic of a natural process of creation by which even human genius abided. The pictorial correlation between the evergreen and the cathedral in Friedrich's *Winter Landscape with Church* is emblematic of this entwinement of natural and cultural forms (fig. 19). Schott's writings repeatedly employ tropes of organicism. In one letter he wrote: "The estate of nations in Europe is more like a withered tree, spending its seeds to the Earth and sacrificing to the same its body."[70] In keeping with this predicate of Romantic inquiry, formal dialogues within the boundary views by Schott bind the individuated specimens and artifacts into a tight pictorial syntax.

[FIGURE] [insert figure 19 near here]

In certain respects, Schott's adherence to Romantic ways of approaching representa-

FIGURE 19 Caspar David Friedrich, *Winter Landscape with Church*, 1811. Oil on canvas, 12¾ in. by 17¾ in. National Gallery, London.

tion worked harmoniously with the demands of his appointed task. The emphasis of the boundary views on identifying unique points along the border was methodologically consonant with Schott's determination to individuate his plants. In addition, the Romantic predilection for formally integrating entities of different registers at times dovetailed with the indexical priorities of the survey. For example, in the first two illustrations by Schott containing an asterisk, the foreground vegetation includes a tall stalk pointing to the otherwise inconspicuous symbol in the sky (figs. 4, 5). In the third, the asterisk appears at the center of an angle defined by two stalks (fig. 6). These botanical specimens thus served to alert the viewer to a critically informative detail and to establish its ongoing use in subsequent views. Indexes of indexes, these pointing plants subtly signaled from the outset that within this peculiar body of work the iconic function of the pictorial sign was fundamentally in the service of the indexical. The dialogue between the vegetable and the celestial (or social) domains here reinforced the evidentiary function of the views.

Schott's entanglement with Romanticism may explain not only the availability of certain principles of pictorial structure and his gravitation to them but also the evocative ways that he put these principles to use. One of the most salient and persistent tendencies within Romanticism was the emphasis upon the irreducibility and sacred potential of experience. Friedrich sought an *Erlebniskunst,* an art that would bring the boundless affective dimensions of experience within the limits of the frame. For his part, Schott sought to protect the integrity of his experience on the boundary against the fragmenting divisions that the survey enforced within its process of production.

But what was the character of this experience that Schott sought to keep integrated? In his correspondence, he often defined his experience on the survey as one of suffering and exile. Driven from Germany by the increasingly violent retaliation against democratic reform, Schott labeled himself a "foreigner" in the United States.[71] The failure of the German revolution had left the dreams of many liberals dashed, and Schott had crossed the Atlantic having evidently lost hope in the political future of Europe.[72] He construed the region along the boundary between the United States and Mexico as his wilderness, and he described his exile there in religious terms. To Torrey he wrote: "The only mission of worthier individuals in Europe is not more to assist in building and affirming a sound estate of affairs, but it is more apostle like, persecuted and deprived of their home, they have to wander and to witness . . . the course of the history of the world."[73] Having disclaimed any faith in the possibilities of the European present, he put his stock in mapping out the geologic and botanical history of the New World.

Schott's construction of the boundary views reinforced the tropes of exile in subtle ways. The substitution of the asterisk for the flag as an index of the path of the boundary line ensured that the designation of near and far would not relate traversable human positions, as it does in the views by Weyss, but rather an earthly position and a celestial remoteness. The assemblages of bare rock, sharp needles, and bleached bones inscribe these stations with hardship (fig. 20). The depicted terrain is entirely concordant with Schott's letters from the field to Torrey and Emory, which repeatedly detail his deprivations and vexations but also insist upon his determination to soldier on.[74] Lacking another means to support himself and his family, Schott declared in one letter that he could not quit his "roving life." His words suggest that he inhabited no country, but only a boundary between two from which he was estranged.

[FIGURE]
[insert figure 20 near here]

The evocation of exile receives reinforcement from the array of prickly specimens that in many views blocks the viewer's imaginary access to deeper spaces. The plastering of botanical entities up against the picture plane and the absenting of any middle ground strand the viewer between myopia and hyperopia. The maintenance of inaccessibility in these pictures accorded with the draftsman's own description of his psychologically fraught geographic suspension. The contradiction of local specificity and spatial dislocation, of yearning and blockage, crops up in Romantic paintings, with the work of Friedrich again

FIGURE 20 Arthur Schott, *View from Iron Monument No. 2, near the Edge of the Colorado Desert, Looking East towards Monument No. 4,* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

offering the most compelling comparison to the boundary views (fig. 21). Exile, in this sense, was a condition of Romanticism. Not all means of blockage and dislocation are the same, however, and the peculiarity of the boundary views should not be overlooked. In several views, the screens of animated plant life have a hallucinatory quality, recalling the desert visions to which wanderers in exile were famously susceptible (fig. 22). Lt. Michler, Schott's immediate superior, reported of one boundary region: "Its parched barrenness, combined with the influence of a scorching July sun, was enough to madden the brain."[75] The divided optic of the boundary views bears signs of both the placelessness and delirium of exile.

—exile. [FIGURE] [insert figure 21 near here] [insert figure 22 near here]

As it often does, the land of exile here both inverts and repeats the homeland. In its desolate desiccation, the terrain of the boundary views stands opposite the vibrant and civilized German states that Schott had fled. At the same time, Schott's rendering of the boundary conspicuously echoed the most typical representations of the revolutionary conflict that had prompted his departure. The cacti and spiny plants that extend like a

FIGURE 21 Caspar David Friedrich, *A Mountain Peak with Drifting Clouds*, c. 1835. Oil on canvas, 9⅞ in. by 12 1/16 in. Kimbell Art Museum, Fort Worth.

screen across many of the views resemble popular representations of the barricades erected in German streets in 1848. Theodore Hosemann's depiction of the uprising of March 18, 1848, in Berlin is an example of a common type that appeared in many journals and newspapers (fig. 23). Even the flag waving above the streets in Hosemann's picture has its counterpart in the flag waving above the border plants in many of the views by Schott. The historian Wolfram Sieman has described the disillusionment among many Germans in the wake of 1848 in this way: "Hope for the future soon gave way to sobriety, as it became clear how riven, how shot through with conflicting interests this newly liberated German society was."[76] Having escaped Germany to chart the wilds of the New World, Schott thus reproduced in his boundary views the divided condition that had driven him away.

[FIGURE] [insert figure 23 near here]

FIGURE 22 Arthur Schott, *View from Monument No. 6, Looking West towards Monument No. 5,* engr. William Dougal, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

This fantastic apparition of home echoes an account by Emory of a mirage he experienced during his first reconnaissance of the Southwest in 1846–47. In his report to Congress, Emory wrote:

> As the sun mounted, the mirage only seen once before since leaving the plains of the Arkansas, now began to distort the distant mountains, which everywhere bounded the horizon into many fantastic shapes. The morning was sharp and bracing, and I was excessively hungry, having given my breakfast, consisting of two biscuits to my still more hungry mule. I was describing to Mr. Warner how much more pleasant it would be to be jogging into Washington after a fox hunt, with the prospect of a hot breakfast, when up rose to our astonished view, on the north side of the Gila, a perfect representation of the Capitol, with dome, wings, and portico, all complete. It remained for full twenty minutes with its proportions and outline perfect, when it dwindled down into a distant butte.[77]

Socially prominent and secure in the proximity of Washington, Emory encountered in the desert an image born of happy remembrance, which also served as a rosy vision of

FIGURE 23 Theodor Hosemann, *Märzrevolution*, 1848. Lithograph.

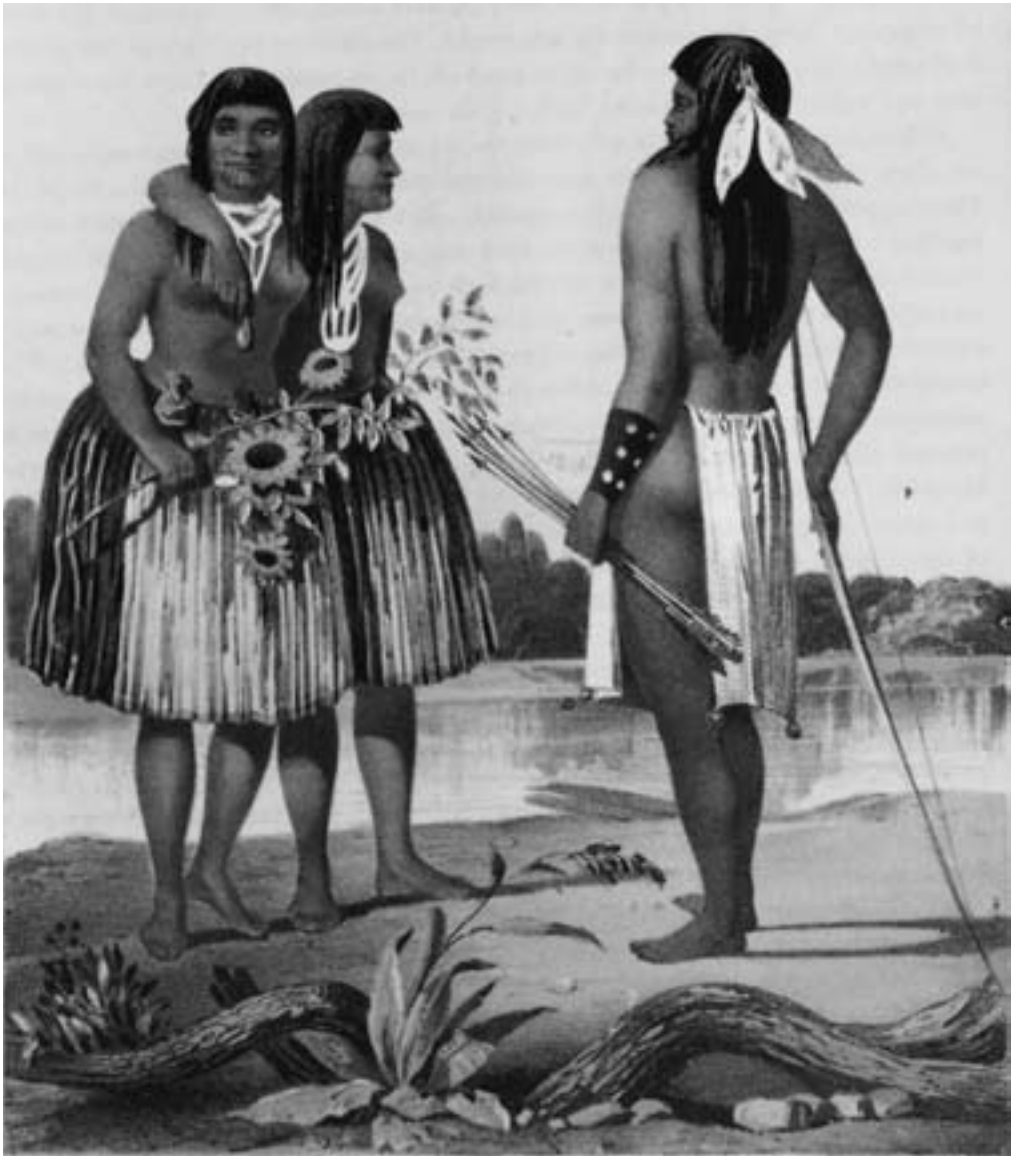

FIGURE 24 Arthur Schott, *Yumas: Figure to the Left, "Portrait of Leoch,"* lith. Sarony & Co., c. 1855. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

destiny manifest. In contrast, the exiled Schott depicted a hallucinatory image of blockage and division.

Another Romantic topos that Schott indulged in his work for Emory was a correspondence between the alienated man of letters and the naive, exotic subject encountered in distant lands. The negotiation of this topos was particularly tricky on the boundary survey. On the one hand, Schott operated within a culture that regarded the mobility of certain American Indian peoples as the quintessential sign of their barbarity. On the other hand, the survey itself was a nomadic enterprise, and Schott wrote of his "roving life." The tension extended to the act of moving things around. While Emory was keenly worried that American Indians would cart off his boundary monuments and their materials, the survey was collecting and carting off countless specimens of geology, botany, zoology, and ethnography. Indeed, in contrast to the disruptive movement of the survey parties through the land, the American Indians, according to Schott, habitually "crept" through the wilderness "disturbing as little as possible."[78] Under the circumstances, it perhaps should come as no surprise that Schott discussed the indigenous peoples he encountered with ambivalence and ambiguity. Although he often wrote disparagingly of American Indians along the border in the diary excerpts published in *Das Ausland,* the chromolithographs in the final report based upon his drawings tend to represent them as romanticized counterparts to Schott himself. A striking number of the figures are depicted either collecting a botanical article or holding one in hand (fig. 24). Without access to the original drawings by Schott, there is no way to know to what extent the idealization of the chromolithographs can be traced to him, but the decision to depict these figures in the act of botanical collection was almost certainly his own.

[FIGURE] [insert figure 24 near here]

Schott described the Mexicans that he encountered with a similar ambivalence. In a letter to Torrey, he wrote:

> I wish you could see me sometimes in conversation with one or the other of Mexican people, inquiring about properties and virtues of plants, for which science this half primitive half decaying race of Spanish and Indian blood, possesses an almost infinite taste. However superstitious and credulous these people may be, I believe, even to that race true science is most indebted for a great many acquaintances of most useful plants. It is that love and that taste for all natural objects, which enable them to live and to enjoy their life in countries, where other people have to starve or where the outlaws and desperados of other nations gather themselves. . . . It is much, indeed very much, what even most enlightened people can learn from these poor children of the wilderness.[79]

Although Schott lauded the naturalist inclinations of these "poor children of the wilderness," he deemed their divided identity much inferior to his own. In a diary entry published in *Das Ausland,* Schott disparaged the "mixed race of today's Mexicans," claim-

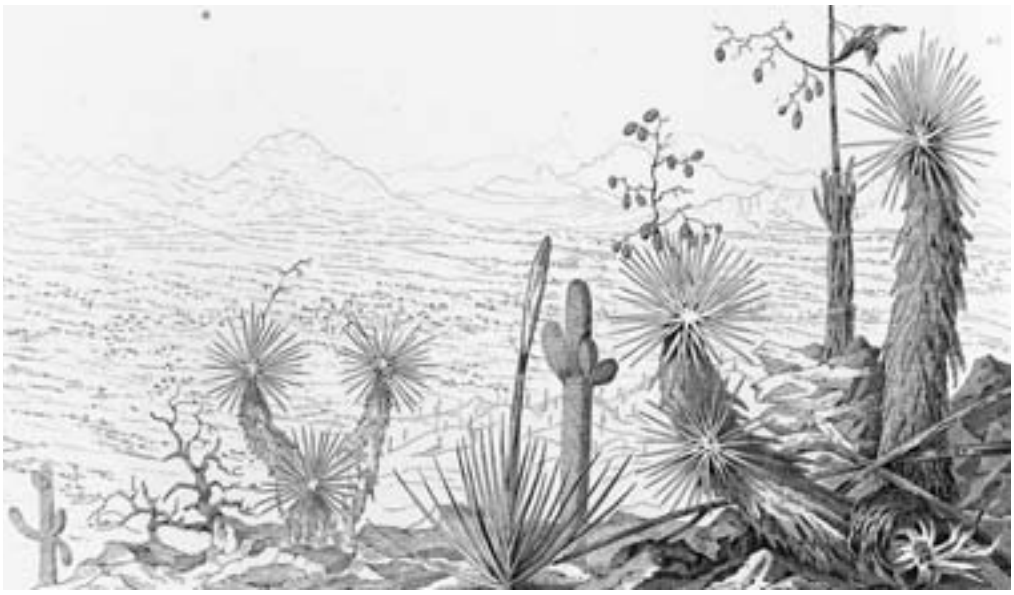

FIGURE 25 Arthur Schott, *View from Monument No. 15, Looking West towards Monument No. 14,* engr. William Dougal, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

ing that "the once heroic blood of the followers of Cortez and the steadfast bravery of his enemies mixed to form water."[80]

The depiction of the monuments in the boundary views also recalls Romantic precedents, particularly the topoi of the ruin or cross in the wilderness. The ruin was the principal Romantic emblem for the ineluctable disintegration wrought by the passage of time and the sense of belatedness and incompletion that historical consciousness brings. Depending upon the temporal mode implied, the ruin could stand for the gradual erosion of eons or for a cataclysmic destruction wrought by some half-forgotten past. The piled stones of many of the boundary monuments would have lent the views a melancholy tenor. Recently discovered and widely discussed ruins in the Southwest would have strengthened the symbolic resonance and suggested the potential of the New World landscape as a site of Romantic experience.[81]

The cross, the ultimate Christian site of fixity, was perhaps an even more compelling counterpart to the boundary marker. Signs of rectitude in barren surroundings, Schott's monuments, particularly those that—standing alone or in conjunction with a plant—offer

a cruciform profile, would have recalled the pictorial trope of the cross in the wilderness, which waxed popular in the 1850s (fig. 25). Thomas Cole had painted a version in 1845, now in the Louvre, and Frederic Church among others tackled the subject in the years that followed (fig. 26). The echo of this popular form in the boundary views would have strengthened the allusion to pilgrimage in a manner entirely in keeping with Schott's Romantic inclinations and his obsessive focus on his own sacrifices. In the same letter in which he revealed his decision to include the botanical specimens in the boundary views, he wrote these words of consolation to Torrey, whose wife had recently died: "If we however take our cross upon us and consider ourselves as not standing solely as individuals belonging to this sublunar world, but as parts of a whole subject and destined to a continuant change of shape and position to approach our true destiny, then we learn to look at losses as so many steps towards eternity." By signifying an association between monument and cross, Schott reinforced his representation of the boundary survey as a celestially guided pilgrimage through the wilderness. Combining a salvation narrative with a Romantic notion of material change, he construed this pilgrimage as one of organic metamorphosis.[82]

—metamorphosis. [FIGURE] [insert figure 25 near here] [insert figure 26 near here]

These traces of Romantic habit, however, threaten to obscure the historical specificity of Schott's inventiveness. The correspondence between monument and cross, for example, was analogically incomplete. The very multiplicity of destinations on the survey suggests the gulf between a world of geopolitical mapping and a world of Christian faith. Unlike the cross, the boundary marker was only one of a potentially infinite number of equivalent markers along the line, defined by the differential position of each. Whereas every other cross is a copy of the true cross and possesses power by virtue of standing in its stead, the boundary marker is not a copy of an original. Every marker holds the same value (hence the variety of markers used by the boundary survey). This compromises the monument as a destination and returns the emphasis to the line itself and the discipline required to keep it true. Schott confided to Torrey, "I never aspired to have much influence through society. An honest living and a straight walk before god is all."[83] Charting changes in position, from one momentary fixity to the next, was a way of coping with a pervasive sense of wayward mobility. Schott traced his experience of drift to the bureaucratic muddling of the survey, by virtue of which Schott complained, "Nothing at all can go straight."[84]

Schott organized the space of many of his views as a cross. In those views that look along the line, the boundary as a cartographic fact (the line defined by the location of the viewer and that of the asterisk) and the boundary as an image (the array of foreground plants and rocks) lie at nearly right angles to one another. It is this cruciform compositional principal that lends the views much of their rhetorical force as pictures of fixity. Submission to the Cartesian axes of the world, the cartographic cross, pictorially relocates the exiled, drifting modern subject on a path depicted as heavenly ordained.

FIGURE 26 Frederic Church, *Cross in the Wilderness,* 1857. Oil on canvas. Thyssen-Bornemisza Museum, Lugano, Switzerland.

The process by which surveyors kept to the line, however ancient, resonated with problems of indeterminacy peculiar to modernity. Rather than presume the fixing gaze of the heavens upon the human subject, surveyors measured and defined that gaze through their measurements. Every movement from an established marker was an unquantified measure of dislocation, a cleavage between heaven and earth that could be corrected only with another round of observation and calculus. The fixing power of the stars had to be secured through an ongoing discipline, a human supplementation symptomatic of the separation around which so much of Romanticism organized itself.

To make matters worse, no act of cartographic fixation was immune to correction by another set of measurements. In certain areas of survey work, the pivot from the minute and proximate to the vast and distant raised concerns about possible amplifications of error. A tiny mistake in reading a small instrument could have drastic consequences in the charting of geography. As Emory mentioned near the beginning of his report: "An error in the latitude or longitude of either extremity, of a few seconds, would produce a

great departure of the line from the point it was intended to strike; the utmost precision was, therefore, necessary to be observed in all determinations connected with the line." Across a range of disciplines, Schott and his colleagues tried to minimize or eradicate error through extraordinary care. Engelmann, for example, was obsessed with representing a specimen's details with the utmost precision, however arbitrary or incidental those details were with respect to understanding the general category to which the specimen belonged. It was as if the extrapolation of error that could intercede between the theodolite and the map could intercede in a similar fashion between the specimen and the species. The excessive reach of this obsession with exactitude perhaps makes most sense as a disciplinary attempt to bridge a space that modernity had opened up between personal and transpersonal registers.[85]

Several of the principal tensions for Schott on the boundary survey—the pious concern for exactitude, the sense of exile, the search for a true linearity—had a special locus in the figure of the cactus. Schott regarded the cactus as the principal emblem for the boundary region, which he referred to as "the cactus world."[86] His correspondence treats cacti as anthropomorphic. In a letter to Engelmann, he referred to them as "kinden," and elsewhere he insisted, "Outdoor in the open nature and freedom, I am almost thus much at home as among good warm sincere friends."[87] Once again, Romantic thought and practice offered ample precedent for such imaginings. Paintings by Friedrich, in particular, offer many examples of anthropomorphic trees and other plants.

For Schott, the kinship of human and cactus fit readily into his narrative of Christian hardship and persecution. In professing the view that humans and plants are not so unalike, Schott argued that that the former, although mobile, still gravitated toward the fixity and suffering of soiled life: "Alas! we are men—beings with an eternal soul imprisoned in a body one or two grades above vegetables which by their roots are fastened to the ground. Though we like other animals are allowed to move freely about, but still we have our roots too, which continuantly seek to fix us to the bottom. So we may not wonder about seeing us often associated with brambles and thorns."[88] Brambles and thorns, symbols of Christian suffering, are here also taken as botanical facts, as objects of quotidian encounter in the desert country along the border. Like the spiny denizens of the desert, Schott persisted despite a dearth of resources and sustenance. According to historian Susan Faye Cannon, Darwin "learned from Humboldt to consider plants as almost self-conscious migrants, as 'colonists.'"[89] Schott evidently drew upon his training in Humboldtian thought to regard the cacti as sympathetic survivors in a hostile world. In his depictions of cacti in the boundary views, Schott approached Schlegel's definition of Romantic art: "what presents a sentimental content in a fantastic form."[90]

With its extrusion of linear needles, the cactus was an emblem of both the exact and the exacting nature of belonging to the world. It caught other beings with its precise indexes and was, as a form, caught by them. The rays of stars that pinned surveyors to

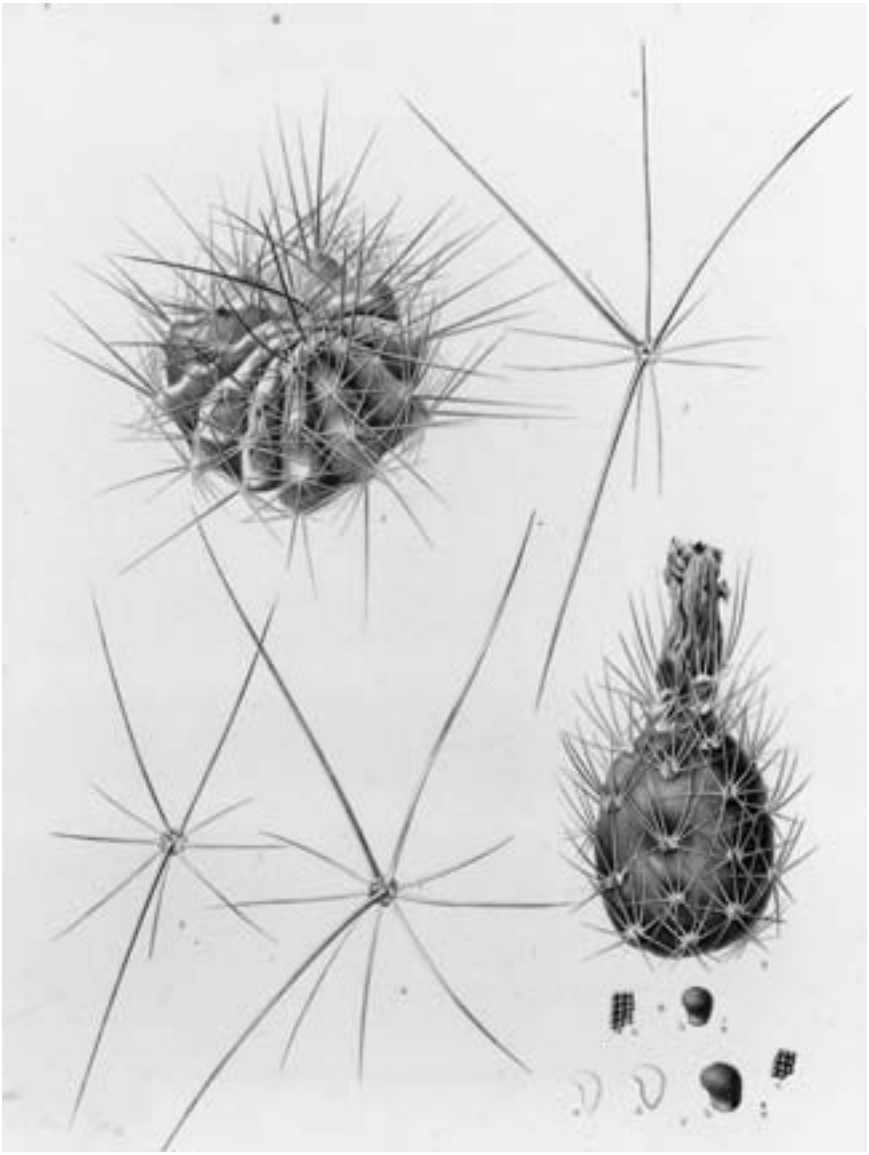

FIGURE 27 Paulus Roetter, *Cereus stramineus,* engr. William Dougal, c. 1855. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 2. Botany Libraries, Harvard University, Cambridge.

locations on the earth or the perspectival lines converging in the boundary views on the site of the monument had their counterpart in the needles of the cactus that pinned it in position as a specimen on the page (fig. 27). Indeed, because it was stuck with its own needles, the cactus was the plant that already took, with redundancy, the archival form of the specimen.

[FIGURE] [insert figure 27 near here]

The rigidity of the cactus needle corresponded with the rigors of survey discipline. In his correspondence, Emory often used the term *rigid* and its cognates in their now mostly forgotten relation to the notion of accuracy. Rigidity was central to surveying the boundary, to walking the line, and the rigid needles of the cactus specimen, so painstakingly rendered by Engelmann, Schott, and other survey workers, became a focus of carrying out and displaying survey efforts.

The cactus also figured the isolation and demand for self-reliance that striving for rigidity entailed. In a letter to Emory, George Engelmann, the author of the report's section on botany, wrote:

> I have now finished 45 plates of Cactaceæ, for your Report. . . . You will see and examine the plates, and *recognize their excellence as works of art*. I can bear testimony to their *minute accuracy* in a scientific point of view, and I must say that . . . [they] will be a credit to all concerned about it and to the country in general. . . .
>
> I mean what I say, though I confess that nobody who has not made the same careful studies about these plants (and nobody has ever done it) can verify what I say.

As the words of Engelmann suggest, the pursuit of exactitude was itself a solitary activity, and satisfying its demands was unverifiable by others. Not unlike the needles of the cactus, the devotion to accuracy imposed a distance between entities. The drawing of the cactus, by virtue of its pointed form, had to carry connotations of its own exactitude, just as the specificity of Schott's views on the boundary had to convey an air of precise locality to those who had never visited the region.

In choosing to feature the cactus, Schott outfitted the boundary views with an emblem of his own fixity and suffering. As he wrote in a letter to Torrey: "After these lines shall be in your hands, your devoted friend will stick in the Prickly Pears."[91] Schott's words suggest an ambivalence about fixity. Roots might stop the drift of exile, but they also tie a human being down "to the bottom," disallowing the elevation that would permit escape from the many pains of the world. The bursts of cacti needles stand in for astral rays, but they also remain a crown of thorns, the resolute embodied suffering of life away from God.

In the first volume of Emory's report, the Romantic discourse of fixity and sacred pain also surfaces conspicuously in a chromolithograph, based upon a drawing by Schott, of Toro-Mucho, chief of a band of Kioway Indians (fig. 28).[92] In the company of several chromolithographs of Indian figures in a nomadic mode, this representation of a kneeling

[FIGURE] [insert figure 28 near here]

FIGURE 28 Arthur Schott, *Toro-Mucho: Chief of a Band of Kioways,* lith. Sarony & Co., c. 1855. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

Indian with a large cross hanging from his neck stands out. Here again, however, we find a striking correspondence between Indian figure and exiled naturalist. In the chromolithograph's central formal dialogue, Toro-Mucho, as if weighed down by the cross he bears, inclines his head to his left, while a cactus, mirroring his disposition, emerges from behind a large rock and leans sympathetically toward him. Like Toro-Mucho, whom he represented, Schott characterized himself as bearing his cross in correspondence with vegetal life and thereby pinning himself piously from place to place.[93] Through this ordeal, the cactus offered a conspicuous counterpart to the surveying subject, a rigid denizen of the border that suffered the terms of its precise location.

The foregoing is my understanding of what motivated Schott to fashion his boundary views in such a distinctive way, what enabled him to do so, and what the historical implications of his work were in light of his position. What this account leaves unexplained is why Maj. Emory, a person of very different background, position, and circumstances, found these pictures acceptable. The next section of the chapter attempts to answer this question.

PROMOTION AND LEGITIMATION

Emory's acceptance of Schott's boundary views is not something to take for granted. When Henry Rowe Schoolcraft was working to complete his study of Indian tribes, one of his congressional appropriations came with this stipulation: "That said compilation shall be subjected, before publication, to revision by the Secretary of the Interior, with a view to the curtailment in the work of all matters useless, irrelevant, or inconsistent with the objects of the work."[94] What Congress then made explicit was always (at minimum) implied: in the production of survey reports, the work of underlings survived only when the supervising bureaucracy deemed it compatible with the government program.[95] Like most leaders of major surveys, Emory became deeply involved in the production of illustrations for his survey report, and the records of the survey are replete with his correspondence with lithographers and engravers in the United States and Europe. Emory and his subordinate officers critically reviewed illustrations at various stages of production and frequently returned pictures for revision when their standards or specific desires went unmet. When the public printer mistakenly set about transferring the boundary views from steel plate to stone, Emory declared that the engravings had "all been done in the highest style of art known to this Country" and that he would "never consent to their mutilation by the process" that the public printer had proposed.[96] So the fact that Emory accepted the unconventional pictures by Schott, insisted upon their exact copying by the engraver, and never indicated any qualms about their particulars is noteworthy.[97]

Emory's acceptance of the views is yet more remarkable because he explicitly acknowledged their strangeness. In a letter to the engraver Smillie, he wrote: "I have twenty

or thirty views [by Schott] to be engraved of the Boundary, which are of peculiar character requiring a rigid adherence to the original. They are mere outlines intended to enable one to identify the Boundary, and intended also to illustrate rigidly the Botany." As this letter makes clear, Emory recognized and appreciated the unconventionality of the pictorial bifurcation between designating the boundary and illustrating the plant life along it. The major acknowledged the "peculiar character" of the views drawn by Schott but insisted that the engravers strictly heed it.

The hypothesis proffered here is that the rhetorical surplus of the boundary views by Schott allowed them not only to tend personal grievances and to signify a Romantic form of discipline but also to bolster the legitimacy of the boundary and the survey that marked it. In the context of the report, the function of these pictures was less the facilitation of actual reconstructions of monuments than a virtual reconstruction of the survey that confirmed its achievements. Whether Emory consciously recognized this legitimating function, the views met his political needs.

As a preliminary matter, Emory was no doubt willing to take advantage of the alleged necessity of the boundary views to include more pictorial matter in his report. At the time, survey leaders routinely used pictures to make their work more vivid and accessible, but for that very reason report illustrations were coming under suspicion and even ridicule. While Emory was preparing his report for the printer, an article in the *New York Herald* criticized various government expeditions, including the boundary survey, for their excessive production of illustrations, complaining that one expedition produced annually "at least two quartos, full of gaily colored oyster shells and antipodean roosters, who go to swell Time's wallet for oblivion, and reduce Uncle Sam's auriferous dropsy."[98] A voice in Congress demanded that the products of the public printer should be "useful and not ornamental."[99]

Of particular concern was the extraordinary cost of the reports being issued by the Pacific Railroad Surveys under the direction of Secretary of War Jefferson Davis. The Pacific Railroad Surveys constituted an ambitious federal effort in the 1850s to determine the best route for a rail line connecting the Mississippi River valley to the Pacific Ocean, culminating in a lavish set of quarto volumes.[100] Congress authorized the printing of twenty-one thousand copies of the report's first ten volumes, thirty-two thousand copies of volume eleven, and fifty-three thousand copies of volume twelve. By Ron Tyler's estimate, the seven hundred twenty-five illustrations for the report as a whole cost nearly half a million dollars to produce, a staggering sum at a time when annual federal budgets were only in the tens of millions.[101] The preceding years had witnessed the emergence of grave doubts concerning the wisdom of government support for extravagant geographical reports, and it was not long before this massive production triggered an outcry.

The excessiveness of the Pacific Railroad Survey reports inflamed growing suspicions of the political circuit within the nation's capital by which surveys obtained financing and de-

livered results. The fundamental problem was the fuzziness of the line between earning additional survey funding by supplying valuable reports to the government and securing such funding by bribing members of Congress with the promise of profusely illustrated and elegantly bound volumes. In 1847, George Gibbs, a Harvard-educated lawyer and later explorer of the Pacific Northwest, offered a jaded interpretation of this circuit in an advisory letter to Schoolcraft, who was about to set out to compile a history of Indian tribes:

> Make your reports to each Session upon the material & the tangible, and above all things have them full of plates. Congress will print them of course & pay for the engraving without writhing. I should if possible give them a small taste at the commencement of the very next session, just to make their mouths water for more, as you bait round your intended fishing place while you fix your lines. One of the elementary powers at Washington, the government printer, is of course easily propitiated. . . .
>
> So long as those devils [in Congress] can count on an illustrated work every session, so long will they make the appropriation. . . . Your great work should be your "final Report"—and for this I should take as much time & demand as many draughtsmen from the office as I could get.[102]

Certain members of Congress acknowledged the potential for corruption. In 1853, Senator Hunter of Virginia admonished his fellow senators: "This habit of printing books for the purpose of gratifying the personal desire, of individuals or officers connected with the Government, for distinction, has led to a great deal of mischief."[103] The rumors of graft in the office of the public printer eventually became formal accusations. By December 1858, the House of Representatives had established a committee to evaluate the charges.[104]

The swelling tumult over the production costs of survey publications unsettled Emory as he strove to finish his own report. In a letter to Engelmann about illustrating survey specimens, he wrote:

> A very serious difficulty has however sprung up in Congress in reference to works of this kind. Several reports have been made to Congress and ordered to be printed. The reports and illustrations have taken a wider range than was anticipated and it is not saying too much to say that some of them are trashy swindles got up for the benefit of Author and Public Printer. . . . Congress is justly incensed and prejudiced against all reports with illustrations, and I do not know what will be the fate of our attempt to have published the Zoology and Botany of the Boundary Survey, those two subjects alone will occupy some 250 plates! We have the money appropriated for Engraving the Maps and Views and some of the illustrations. I shall leave nothing undone to effect the object. [105]

Correspondence between Emory and the specialists working on the report bear many signs of his heightened anxiety regarding the cost and justifiability of illustrations. Time and

again the scientific importance of illustrations was contrasted with a mere visual appeal to distinguish the pictures for the boundary report from the objectionable fluff causing a furor in the capital. While working on assembling the illustrations of cacti, Engelmann wrote in a letter to Emory: "The Artist ought to know that they are to be *not* merely pretty pictures, but *botanically correct* engravings."[106] Such was the insistence of Emory to Congress as well.

Controversy attended both the expense of survey illustrations and their questionable worth to the public that had paid for them. Less than a week before Emory warned Engelmann of the rising ire of Congress, Representative Davis of Maryland had declared on the floor of the House: "Elegant views of scenery, disquisitions and personal incidents, descriptions of the red men, and of the shooting of flying buffaloes, and all the matters of summer tours, which crowd the pages of all those reconnoissances which have been published during the last four or five years, have no business in Government publications, and ought not to be sanctioned."[107] In a subsequent debate in the other chamber, Senator Simon Cameron, who would soon become President Lincoln's secretary of war, issued his own diatribe: "I am tired of all this thing called science here. It was only the other day we made another appropriation in regard to the expedition which Captain Wilkes took out to the Pacific Ocean. We have paid $1,000 a volume for the book which he published. Who has ever seen that book outside of this Senate, and how many copies are there of it in this country? We have spent millions in that sort of thing for the last few years, and it is time it should be stopped."[108] Cameron's rant was a bit of political grandstanding, of course, but the most pointed question within it—"Who has ever seen [Wilkes's report] outside of this Senate?"—implicitly raised the serious and delicate issue of whether survey publications were functioning more as promotional materials than as scientific references. Although Cameron's words have been cited as an example of thick-skulled resistance to the advancement of knowledge, there is a difference between being tired of science and being tired of "this thing *called* science *here*" (my emphasis). The fact that survey leaders had every reason to use funds *from* Congress to produce expensive promotional materials aimed *at* Congress gave them a strong incentive, at least while in the nation's capital, to call something science that primarily functioned as advertising.[109]

The accusations directed at the producers of survey pictures claimed not only that many pictures served as advertising but also that some pictures, obtained at considerable expense to the government, were garnering private profits. In a letter by Emory published in a Washington paper in 1854, the major complained that Henry Platt, who had produced pictures for the boundary survey under Emory's predecessor, John Russell Bartlett, was withholding them from the government for private gain: "Mr. Pratt . . . made valuable and extensive sketches of Indians and scenery; and of the whole collection made by him, at considerable cost to the government, nothing whatever was turned over by Mr. Barlett. . . . Now, then, here was property belonging to the government, of both intrinsic

and mercantile value—property unlike collections in natural history, valuable only in the hands of scientific men, but property easily transferable, and convertible into money." Emory went on to explain that he had come across a notice in the *New York Times* advertising Bartlett's illustrated "personal narrative" of his boundary explorations and concluded that the Pratt illustrations were being withheld to make private profit.[110] There were also accusations, of uncertain seriousness, that members of Congress were selling government publications distributed to them to local bookstores.[111] Survey pictures thus came under suspicion both for their private worth and for their public superfluity. With respect to both suspicions, survey leaders confronted a need to establish the practical necessity and public benefit of the illustrations they produced.

Under these volatile circumstances, Emory characterized the production of the boundary views as central to the task set by Congress and thus distinguishable from the routine production of illustrations for survey reports. Congress generally earmarked funds for the production of illustrations as a way to control survey spending. Emory, however, used his regular funds for running the boundary to pay for the production of the boundary views. When the comptroller of the U.S. Treasury pressured Emory to explain, the major replied: "I have not thought it improper. . . . For marking the Boundary in a liberal acceptation is transferring to paper and Steel the Topography and views which perpetuate the line and enable parties concerned to identify it. It in truth can be marked permanently in no other way." [112] Troubled by the destruction of the boundary monuments, Emory sought to enlarge the notion of marking the boundary to include the graphic record in the archive. This "liberal acceptation" departed from legal precedent. During the course of the survey, the U.S. attorney general, Caleb Cushing, in an opinion presented to the secretary of state concerning the establishment of the boundary, asserted that surveying and marking the line were "physical or mechanical acts," and all attending graphic matter was "but illustration or authentic statement of acts already performed."[113] In his accounting, Emory insisted to the contrary that these two sets of views offered a critical and enduring interface between the boundary as an abstraction and as a real line on the earth and thus should be immune from concerns about an overproduction of ordinary illustrations. This insistence not only extended his case that the problem of boundary marker destruction had been overcome but also rationalized the inclusion of two sets of illustrations at a time when the necessity of pictorial matter in survey reports was under suspicion.

Emory's official rationale for including the boundary views in his report and paying for their production from general funds for marking the line left unexplained the necessity of the charismatic foreground plants. Outside of the letter to the engravers, Emory never acknowledged these depictions of specimens and the hybrid structure of the views that their inclusion entailed. Schott, evidently oblivious to the difficult negotiation that Emory faced, urged the major to give the foreground specimens greater attention in his report. In a letter to Torrey, Schott asserted that the views "ought to be accompanied by

a small explaining context" to enable viewers to become acquainted with "the names of those odd vegetable creatures of the western wilds," adding that Emory had refused to accede to this request. Although Schott blames the major's "hurry," Emory was doubtless wary of acknowledging that botanical fascination and not boundary marking had informed much of the pictorial work.

The use of views as an auxiliary to maps had been employed by some of Emory's predecessors. In his 1841 volume *Twelve Views in the Interior of Guiana,* the anglicized Prussian explorer Robert H. Schomburgk included a map with the locations corresponding to the twelve views underscored in blue.[114] Lieutenant Edward G. Beckwith, who completed the survey of the thirty-eighth parallel as part of the Pacific Railroad Surveys, also correlated views and maps and even used a pictorial emblem of a column of smoke in the former to indicate where his survey had camped. Beckwith insisted explicitly in his 1855 report that the illustrations were not for contemplative pleasure: "The landscape views are presented with no purpose of representing the beauties of the scenery of the country, but to illustrate its general character, and to exhibit on a small scale the character of its mountains and cañones, and of its plains and valleys."[115] Like Emory, Beckwith used the coordination of maps and views to justify the production of the latter. But Emory did Beckwith one better by insisting that his views were not simply illustrations but indispensable geopolitical tools.

As a practical matter, the very inclusion of the boundary views in the Emory report was arguably excessive. While the notion of offering a backup system for reconstructing the monuments may have justified the making of these pictures and depositing sets with each national government, it did not clearly justify reproducing every view in a volume of broad circulation, especially when no maps of the boundary region were included.[116] As rhetorical material, however, the views and their distinctive properties were arguably essential. They addressed five fundamental problems that the boundary posed for Emory as an agent of the government.

The first problem was the remoteness of the boundary. Most of the readers of Emory's report would never venture anywhere near the Mexican border, and so the major faced the problem of how to make his survey of it palpable and vivid. The boundary views took the report reader on a virtual tour of the boundary from east to west, one monument to the next. By this means, they pictorially reconstructed the survey and declared its success in fixing the boundary in specific places. Schott's care in rendering the foregrounds, however gratuitous with respect to recording the locations of boundary monuments, endowed each picture with a distinctive, intimate tenor. The resulting pictures allowed the viewer to orient him- or herself on the boundary as a pictorial experience.

The second problem with the boundary was its arbitrariness. Modern nationhood has entailed a continuous insistence on the organic unity of people and place. The arbitrariness of borders threatened to expose the contingency of the nation as a whole. As D. Gra-

ham Burnett has discussed, taking possession of territory through the raising of the flag always implies a lack of prior possession, a lack that inevitably calls the legitimacy of the claim into question. The perfectly straight border, a conspicuously modern invention, bears a special capacity to threaten the organicism of national identity.

Within Schott's boundary views, the rift between proximity and distance naturalized the notion of boundary. In each view, the land is represented as bifurcated by a seam, providing the boundary with a pictorial correlate. The copious vegetation across the foreground lends an organicism to this cleft. As previously noted, in most of the views, this natural divide lies perpendicular to the geopolitical boundary being surveyed. The line between the United States and Mexico is not equated with this pictorial break but linked to it analogically. The views chart the boundary in one direction and represent it in another.

The dialogues between boundary markers and surrounding terrestrial forms took the naturalization of the boundary a step further. The first four views alternate between featuring boundary markers and broken trees (a popular Romantic conceit), as though the two were in some metaphoric way fungible (figs. 4, 5); and in several views a cactus or other plant echoes the form of the boundary marker or flag (figs. 1, 5, 9, 20, 24). Whether these dialogues arose out of Romantic notions of interconnectedness, they offered an emblematic conjunction of the artificiality of the straight boundary established by treaty with the organic specificity of the actual site. The arbitrary points of the map appeared in accord with the forms of local biota.

For Emory, the interlacing of boundary monuments and terrestrial forms would have affirmed not only the naturalness of the boundary but also the susceptibility of the monuments to destruction. Several views depict cacti in states of damage or decay, and the alternation between monument and broken tree in the early views undermined the connotation of permanence that otherwise would have attached to the former. In this way, the set of thirty-two views anticipated the very degeneration of the monuments that justified its production and inclusion in the report. By encompassing the cycle of growth and decay and offering an outline of the distant topography, the views purported to transcend the inevitable ruination of local forms and protect the work of the survey for posterity.

The natural affirmation of the territorial divide extended to the asterisks that indicated the path of the boundary.[117] With respect to their ostensible function, the asterisks are puzzling. Whereas the flags used by Weyss are located on the horizon, rendering the course of the boundary easy to discern, the lofty asterisks insist upon an unhelpful gap between the index and the boundary it defines. The best way to understand the acceptance of this gap is to consider the asterisk's connotative functions. Viewers in Emory's day would have associated these asterisks with the celestial bodies used by surveyors to determine terrestrial position. We can reasonably surmise this on the basis of the appearance and altitude of the asterisks, as well as on the circumstances of their production and reception. Be-

FIGURE 29 Thomas Cole, *The Angel Appearing to the Shepherds,* 1833–34. Oil on canvas, 101½ in. by 185½ in. Chrysler Museum of Art, Norfolk, Va., gift of Walter P. Chrysler, Jr., in memory of Edgar William and Bernice Chrysler Garbisch.

cause the survey employed a linear traverse, mapping was principally a process of assigning distinctive sites on the earth's cartographic locations by astronomical measurement.[118] On survey maps, Emory had used the star as an emblem to indicate where celestial observations had been performed.[119] The asterisks would have reminded viewers of this relation of near and far, negotiated through exact points and precise tabulations, that purportedly yielded the boundary as an archival certainty.

The asterisks would also have invoked the trope of the celestial body as divine beacon. Thomas Cole's *The Angel Appearing to the Shepherds* of 1834 is one of many roughly contemporary works that employed this old motif (fig. 29). Perhaps coincidentally, Smillie was making engravings of pictures by Cole around the time that he was reproducing Schott's sketches.[120] In any event, readers of the report in the mid-nineteenth century would have been quite familiar with the notion of celestial guidance in the desert. Some years prior to the publication of Emory's report, an illustrated book recounting the travels of John Lloyd Stephens in the Holy Land had been issued to much acclaim. In Emory's report, viewers followed the asterisk in the sky from site to site, making their way on a pilgrimage westward along the boundary.

—boundary.
[FIGURE]
[insert figure
29 near here]

The pictures by Schott thus represented the boundary as a matter of both Manifest Destiny and natural process. By giving sanction to the boundary through the use of the asterisks and naturalizing the boundary markers by integrating them with their organic surroundings, these views suggested that the new border between the two countries, and the American expansion that it formalized, was in accord with both heaven and earth. In this respect, Schott's accommodation of Emory's needs may have been more a matter of ideological alignment than historical coincidence. In a patriotic poem by Schott published in 1853 in the *Neu-Braunfelser Zeitung,* the first iteration of the refrain reads, "Keep yourself strong [Columbia] / in your salvation Heaven itself takes part."[121]

A third problem facing Emory that Schott's views addressed was the widespread fear in the United States of an influx of Mexicans into the national populace. Racial concerns that such an influx would threaten the republic did much to rein in enthusiasm for conquering and claiming more or all of Mexico.[122] Even so, the imaginary line that stretched from the Rio Grande across the desert offered those harboring such fears little reassurance that the country was safe from incursion. The boundary views drawn by Schott, which feature sprawling cacti that often extend across the picture like a barricade, associated the boundary with a protective physical barrier. That this barrier lay perpendicular to the boundary in most of the views may perhaps have mitigated this rhetorical effect, but the history of advertising and its attendant research suggests that such literal contradiction often does little to interfere with processes of association.[123]

The power of determining and preserving the boundary had an implicit ethnographic affiliation in Emory's report. Most of the chromolithographs of Indians in the report, which were based upon drawings by Schott, emphasize motion and portability. They show Indians walking or on horseback, with one or more figures holding a long implement—a pole for gathering fruit, a walking stick, a bow, or a rifle. The mobility of indigenous peoples functioned routinely in government discourse as a sign of their status as uncivilized (despite the fact that many Indians moved because they had been displaced).[124] In the report, the transport of the implements offers a contrast to the fixity of the planted flags in the boundary views (fig. 24). Thus a concern for Indians moving or mutilating boundary markers doubtless informed the acceptance of the two sets of illustrations.

If this hypothesis is correct, then we should expect that the anomalous portrait of Mucho Toro, kneeling on the ground with the cross around his neck, would have left Emory uneasy. Here was an Indian figure that embodied the rootedness and sanctity that Emory insisted the Indians were likely to disregard. Sure enough, in his report Emory went out of his way to rebut any connotation of true piety on the part of the picture's subject: "'Mucho Toro" paid me a visit in full dress, on which occasion he displayed great humility, exhibiting conspicuously on his person an immense silver cross, which he stated had been given him by the Bishop of Durango when he was converted to Christianity. He had, no

doubt, robbed some church of it."[125] Emory's words not only restored the ethnographic hierarchy but also specifically reinforced the notion that the local Indians were predisposed to making off with sacred markers.

A fourth problem for Emory that the views by Schott confronted was the difficulty of representing the vast and desolate spaces along the boundary as having been rendered organized and manageable by the survey. In this respect, it is worth noting that for Schott and Emory, as well as for close readers of the report and those knowledgeable in surveying, the asterisks would have resembled not only celestial bodies but also the rockets and gunpowder flashes that Emory used as signals and to determine local longitudes. The standard means of determining longitude was to compare the local time of a location of known longitude to that of the site in question and to convert the difference in time into a measure of distance based on the rotational speed of the earth at that latitude. The difficulty was arranging for a simultaneous observation of these local times. By having a rocket or flash of gunpowder simultaneously observed at two locations and the local time of its appearance recorded, this problem could be surmounted and the difference in local times measured. In multiple passages in his report, Emory makes reference to this practice. He notes at one point: "The longitude of [two stations] . . . were respectively transferred . . . by flashes of gunpowder simultaneously observed. It was my desire to extend this beautiful and accurate mode of obtaining differences of longitude to many other stations; but . . . it was impossible to do so." Although Emory was unable to use this technique as much as he would have liked, his survey nevertheless used it at several stations to measure out the boundary in longitudinal segments.[126]

For Emory, the rockets and gunpowder flashes were both practical and aesthetically pleasing. They offered a momentary illumination in the night sky that helped to determine the global position of the viewer. The survey was an endless game of "where are we?"—a perpetual matching of a real location on the earth to a place on the archival map. The sudden flash of gunpowder in the sky offered a moment of revelation, a sudden and dramatic means of ascertaining terrestrial location through an emblem of military might.

This technique of determining longitude was, in a sense, photographic: the flash yielded a fixing in space-time, a record of position that could endure in the archive.[127] The indexical bursts in the skies of Schott's sketches recalled both the bursts of signal rockets and the cartographic points of fixation they secured. Each site on the boundary was both a unique point on the earth and a differential location in the diurnal order. The flags caught in breezy midflap would have impressed some viewers with this conjunction of fixity and instantaneity. The fact that the asterisk and the flag were fungible notations for indicating the staccato path along the boundary deepened the connection between cartographic fixity, military power, and national destiny.[128]

The boundary views represented space as newly organized by a system of signal and

transmission. The flags of the boundary markers both denoted the territorial line and offered targets for the surveyor's scope.[129] They evoked, by association, the military's semaphore system of signaling that was swiftly being replaced by the telegraph.[130] The survey's use of flashes and rockets converted space to time and back to space again. In this process of translation, space became marked out as a series of relays passing across the continent. When the survey began its final work on the azimuth between the Pacific Ocean and the junction of the Gila and the Colorado Rivers, Emory used his rockets and flashes in a serial system to determine the relative longitudes at the termini of the line: "Counting the stations, including the observatories, from west toward the east, and numbering them 1 to 5, it was believed that flashes could be seen from 1 to 2, from 4 to 5, and from 3 to both 2 and 4. Having the local time of flash at 2 observed from 1, the difference between the flash at 2 and the flash at 4, observed from 3, and the local time of the flash at 4, observed from 5, the difference in local time between 1 and 5 is given, and consequently, the difference in longitude."[131] The relay system accommodated that the system of rockets and flashes was constrained by the range of human sight. Its mode of transmission was as old as the signal fire. The exigencies of the Civil War would render such constraints unbearable, but even during the boundary survey this rudimentary system of transmission was being pushed to its limits to determine quantitatively exact positions separated by vast distances.[132] The boundary views made such a relay a principle of representation, pictorially reconstructing the parceling out of the boundary in differential segments. The continuity of the panorama lay fractured in bits. In experiencing the serial relay from view to view, the reader of the final report encountered a new pictorially analytic mode of apprehending the national domain, a mode that insisted upon a simultaneity that could measure out exact distances across the continent.

Such a parceled representation of national lands was on the minds of many leaders of government and industry. New means of transport across the continent entailed reconfiguring space as a set of discrete distances connected by stations. The short-lived but much-storied Pony Express operated in accord with such a scheme, as did the crucial new means of transport, the railroad. Congress had asked the boundary commission not only to fix the new line but also to describe and evaluate a proposed southern route for a transcontinental railroad that would be immune from the severe weather attending the mountain passes to the north. The serial relay of the boundary views was redolent of the new ways of interlocking space and time fostered and enforced by the railroads and the postal system. The views define geography by stoppages or stations that measure out the unequal distances between them in space and time. This was a modern, measured pilgrimage. By dividing up the land into these different instants, linked in a series and simultaneously apprehended, the views prefigured the organization of the country into standard time zones in 1883. By naturalizing such an order of space and time, the views subtly underscored the linkage between the survey and the proposed transcontinental rail line that it was

charged with evaluating. It was as though the survey had organized space and time themselves in a manner that prepared the way for the establishment of rail transit along the border. For Emory, who owned land in a town named New San Diego, "which only existed on paper and whose development depended on the arrival of a railroad," such a representation would have been doubly welcome.[133]

Although the views by Schott seemingly tailored the boundary region to the railroad, we should bear in mind the more general modernity of their insistence upon the collapse of time into instantaneity. Not only did they represent plants in various stages of development and decay, they also combined clarity and vagueness in a manner that brought the optical effects of day and night into an uneasy coexistence. The only plausible diurnal moment within these representations is dusk. The lone asterisk in the sky suggests an early star of evening, and Emory and his employees usually set off the gunpowder flashes and rockets just after sundown.[134] The liminality of the diurnal moment speaks to the Romantic understanding of pasts and futures vested in a present, including the morphogenetic program of plants, but also to the eradication of lived time in modern forms of transit and transmission.[135] In the 1850s, the paradigmatic force collapsing time was less the railroad than the telegraph. In the years just prior to those of the boundary survey, telegraphic lines had connected New York to Philadelphia and Philadelphia to Baltimore, and by 1850 there were over twelve thousand miles of telegraph wires in operation.[136] Telegraphy allowed messages to connect spaces into a differential network, in which divergent times came into contact through the dissemination of coded messages.[137] Schott organized the boundary in his serial views in a consonant fashion.

THINKING ALONG THIS LINE

For all of these reasons, Emory's acceptance of Schott's unusual views along the boundary should not surprise us. As engraved by Dougal and Smillie, the views displayed the success of the survey in tracing the boundary to specific places on the ground, and the very notion of *boundary* ordered them internally. Botanical and geological forms particularized each site and harmonized with any boundary markers present. The screens of prickly foreground vegetation represented the boundary as having been precisely located and associated it with a barrier to entry. Starlike bursts in the sky indicated the direction of travel that would take the viewer from one station to the next, connecting disparate locations through a relay of differential simultaneity. In these and other respects, the second sequence of boundary views legitimated the boundary and the survey that defined its official course.

The divided authorship that this chapter has described produced pictures that resist cognitive resolution. Although I have striven to explain how the same pictorial style could

FIGURE 30 Arthur Schott, *View from Yuma Hills, below the Junction of the Colorado and Gila Looking East towards "Sierra de San Pedro," or "Dome Mountain,"* engr. J. D. Smillie, c. 1856. Plate from William Emory, *Report on the United States and Mexico Boundary Survey,* 1857, vol. 1. Botany Libraries, Harvard University, Cambridge.

yield divergent meanings for different people within the survey as an organization, this does not mean that these pictures were free from internal tensions. At times no happy coincidence of interests could hold the style together. A good example is the last of Schott's boundary views, which depicts a view from south of the junction of the Colorado and Gila Rivers, looking back east (fig. 30). Having followed the celestial beacon through the thorny wilds of the boundary area, Schott and the viewer arrive at the California border and turn to gaze in the direction from which they have come. Here and there, the scene offers signs of destination. The attention to the details of the bluff across the river does much to bring together the divided optic so distinctive in the previous views. The watchtower and building perched on the bluff offer the first signs of habitation in the set and thus stand in contrast to the boundary monuments—mere territorial markers—in previous images. But these signs of destination find friction in opposing signs. Although an inhabitable middle ground has finally appeared, it has done so in the form of skeletal structures squeezed into the upper-left corner of the image, separated from us by the broad

[FIGURE] [insert figure 30 near here]

paper surface of the river. At our feet lie earthy swells topped with uncharismatic plants. Interpreted as a thematization of experience, the scene suggests a boundary without a boundary, a line leading only to a sign of its own divisiveness. From the point of view of the government officials that oversaw the survey, the scene would doubtless have spoken reassuringly of panoptic privilege and topographic protection. But for a subject for whom this institutional perspective is alien, and as the culmination of a journey, the scene is hollowed out and incomplete.

This chapter has largely organized itself around the split between, on the one hand, the issues and allegiances of Schott and, on the other, the pragmatic concerns of Emory. As I read the historical evidence, this organization finds justification in the distance that separated the two and the improbability of either party reaching much across the divide. Schott was consistently impractical and impolitic on the survey, habits that no doubt contributed to his struggle to support himself in later years. "I hate all hierarchical dealings," he once wrote to Engelmann, and his resistance to the official program of the survey report attests to this.[138] Emory, for his part, was a stubborn man of enterprise who would have been unlikely to indulge a draftsman's Romantic imaginings of exile for their own sake.[139] Nonetheless, it would be imprudent to suggest that the cleft between the two was as clean as all that. In particular, there is good reason to entertain the possibility that Schott, who had a patriotic streak, recognized and willingly accommodated Emory's need for legitimation in certain respects. In particular, the formal dialogues and echoes that knit together asterisks, cacti, flags, and rocks could very well have been calculated efforts to naturalize both boundary and survey as well as habitual returns to Romantic notions of interconnectedness. For his part, Emory possessed a genuine interest in cacti and at times indulged ideals out of keeping with his practical temperament. His aesthetic preference for the outmoded use of gunpowder flashes to determine longitude, for example, suggests a romantic desire for geographic relations of connection and disconnection to make a skyward appearance. In the end, dividing up the requisite conditions of the coding of the boundary views precisely is far less important than acknowledging the fundamental operations within the archive that informed it.