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ANDREW SLUYTER

TRAVELING/WRITING THE UNWORLD WITH ALEXANDER VON HUMBOLDT¹

View of chinampa agriculture near town of Tlahuac south of Mexico City. Photo taken by Robert C. West, July 1947

The World Bank estimates that some twenty-five million Mexicans, a quarter of that country's population, live in extreme poverty and suffer chronic hunger. The causes of that horrible situation are theoretically controversial, even in general terms, but so long as development remains broadly defined as improvement in social and environmental well-being few would argue against the urgent need for policies that would develop Mexico and the other Latin American countries that Alexander von Humboldt traveled through at the beginning of the nineteenth century. The net result of six decades of international development effort, however, as measured from the founding of the World Bank in the 1940s, has been an increase rather than a decrease in the number of impoverished Mexicans and, more broadly, people throughout Latin America. Many, therefore, should agree that development theory requires

improvement so that it can begin to provide a basis for policies that actually work. And at least some should also agree—given globalization's increasingly undeniable entanglements of politics, economy, and culture—that such improvement should include the systematic integration of culture theory into a project thus far dominated by political-economy theory.

The concept of unworldment introduced by Terkenli in Chapter 1 might provide just the necessary analytic leverage to achieve such integration. Development, developed, undeveloped, underdeveloped, developing, and so on all have conceptual roots in political-economy, and derivative policy therefore emphasizes trade and governance issues. In contrast, unworldment and its putative variants—worldment, unworlded, underworlded, lesser worlded, worlding, and so on—derive from culture theory: not deterministic, categorical culture theory but processual culture theory (Sluyter, 1999). Unworldment signifies the processes through which places and their landscapes become unmade, through which sense of place dissipates along with awareness of involvement in the material/conceptual transformation of landscapes over many generations (Sluyter, 2001). Worldment would thus be the positive variant of unworldment, the cultural analog of economic development, and designate the multigenerational process by which people become native to a place (Jackson 1994).

This chapter addresses the potential of the concept of unworldment and its variants to provide a basis for the integration of culture theory into development theory and thereby help to explain why so many more Mexicans suffer extreme poverty now than half a century ago. Among culture theorists, Mary Louise Pratt (1992) assigns von Humboldt a major role in unworlding Latin America but emphasizes cultural processes to the near exclusion of political-economy. Her analysis thus remains largely incommensurable with development theory. To integrate culture theory and development theory, this chapter follows Pratt in her focus on von Humboldt but uses landscape, a phenomenon that incorporates the full spectrum of biophysical and social processes, to reveal the linkages between unworldment and undevelopment.

Specifically, what follows analyzes the Gulf lowlands of Mexico in relation to unworldment, undevelopment, and the interactions among von Humboldt, his texts, and the material/conceptual transformation of landscapes (Figure 1). The next section proceeds from an elaboration of von Humboldt's role in the unworldment of Latin America in general, to his travels from March 1803 to March 1804 through Mexico, then part of the colony called New Spain, to the major text to derive from that year of research: the *Political Essay on the Kingdom of New Spain*. Throughout, analysis emphasizes the linkages between unworldment and undevelopment. The subsequent section continues that emphasis but focuses analysis on material/conceptual transformations of Gulf lowland landscapes, moving from the precolonial to the colonial to the (post)colonial

VON HUMBOLDT: THEORY, TRAVEL, TEXT

Von Humboldt and Unworldment

According to Pratt (1992, pp. 111-143), the texts von Humboldt wrote on the basis of his 1799-1804 journey through Latin America, just before the Spanish empire was to begin fracturing into independent republics, contributed significantly to that region's unworldment.

Figure 1. Von Humboldt's travels in New Spain and the location of the Gulf lowlands. Source: after Brand, 1959, fig. 1.

She concludes that his characterization of Latin America, particularly South America, as primordial nature gave scientific legitimacy to the pristine myth that had first emerged during the early colonial period, beginning with Columbus in 1492. That pristine myth maintains that the precolonial Americas were undeveloped, a hemispheric version of the more general myth of emptiness that came to pertain to many European colonies (Blaut, 1993; Denevan, 1992; Sluyter, 1999). In a process of unworldment, the sense of place of native peoples dissipated along with awareness of their involvement in the material/conceptual transformation of their landscapes over thousands of years. The places of Latin America thus became characterized as a New World that contrasted with the Old: one puerile, the other mature. At the end of the colonial period, von Humboldt so reinvigorated that pristine myth that it came to dominate (post)colonial Latin America.

Even the label "New Continent" is revived, as if three centuries of European colonization had never happened or made difference. What held for Columbus held again for Humboldt: the state of primal nature is brought into being as a state in relation to the prospect of transformative intervention from Europe (Pratt, 1992, pp. 126-127).

Pratt does not much elaborate the linkages between von Humboldt's reinvigoration of the pristine myth and development, but the effect of such cultural unworldment on political-economy has indeed been profound (Sluyter, 1999). If the political-economic divide between the developed and the undeveloped emerged out of the colonial redistribution of global resources, labor, and capital, that same process involved the emergence of a cultural divide between the worlded and the unworlded (Adas, 1989; Said, 1979; Wolf, 1982). Colonial depopulation, truncation of oral histories, destruction of texts, and material/conceptual transformations of landscapes

largely unmade the worlds of late precolonial Latin America (Sluyter, 2001). Europe became categorized as advanced, dynamic, and the source of everything good in contrast to backward, static, empty Latin America. That pristine myth has become so indurated as to resist erosion even by the accumulation of much contrary evidence (Turner and Butzer, 1992). Its development effects include the privileging of western institutions and technologies over native ones, the categorization of native peoples as being too traditional to participate actively in development, and the general conflation of economic development with cultural westernization (Sluyter, 2001).

Pratt's indictment of von Humboldt as instrumental to the unworldment of Latin America hinges, as do similar analyses more specific to Mexico (Florescano, 1994, pp. 203-204), on deconstruction of his writings in the context of his well-established dual status as one of the founders of modern science and as highly influential among the nineteenth-century elites of the Latin American republics. Regarding the nineteenth-century formation of the modern scientific disciplines, von Humboldt is seminal to geography and several other field sciences such as botany and anthropology (Livingstone, 1992, pp. 133-138). Some have even characterized science in the first half of the nineteenth century as "Humboldtian" because he provided a model for projecting the laboratory into the field through systematic measurement of widely distributed but related phenomena, thus revealing patterns and inducing general processes. Regarding his influence among the nineteenth-century elites of the (post)colonial Latin American republics, those of Mexico, for example, so admired him that upon independence the legislators of the State of Mexico declared him an honorary citizen, and upon his death in 1859 President Benito Juárez posthumously awarded him the Benemérito de la Patria (Mendoza Vargas & Azuela Bernal, 2003, p. 20; Miranda, 1962, pp. 106-107, 205-210; Pratt, 1992, pp. 111-113, 175-82; von Humboldt, 1980, p. 272).

Such textual analyses as Pratt's and Florescano's, however, necessarily remain partial because nobody, no matter their social or intellectual status, can unilaterally impose a concept about a place on a place. The (post)colonial reinvigoration of the colonial idea that the precolonial landscapes of the Americas were pristine must, by definition, relate to and in some way be consistent with other aspects, both conceptual and material, of those landscapes. In Mexico, local versions of the pristine myth emerged during the early colonial period through a process of material/conceptual landscape transformation (Sluyter, 1999). On logical grounds, similar processes must have occurred at the juncture between the colonial and the (post)colonial, and those processes must have involved the influential von Humboldt. His writings, as demonstrated by Pratt's and Florescano's analyses, were centrally involved in reinvigorating the pristine myth for Latin America in general and Mexico in specific. But those writings were based in good part on his observations of landscapes in South and Middle America, and therefore those writings partially derived from the colonial transformations of those landscapes and subsequently became involved in their (post)colonial transformations.

So the conclusions of literary scholars verge on idealism unless complemented with analysis of the long-term process of material/conceptual transformation of the landscapes von Humboldt traveled through and wrote about (Sluyter, 1997). The next two subsections therefore address, in turn, those travels and writings for Mexico in general.

Von Humboldt's Travels in Mexico

Together with Aimé Bonpland and Carlos Montúfar, von Humboldt landed at Acapulco on 22 March 1803, just seven years before the Grito de Dolores nominally began the War of Independence. He was thirty-three years old and had already spent nearly four years in the American tropics. In 1799, he had obtained permission from the Court in Madrid to conduct scientific research in its American colonies, an extraordinary accomplishment given that for three centuries the Spanish Crown had restricted entry mainly to its own subjects (Puig-Samper & Rebok, 2002; von Humboldt, 1980, pp. 248-250). Spanish officials had closely supervised previous exceptions, such as the French La Condamine expedition to Ecuador in the 1730s (Pratt, 1992, pp. 15-17). In contrast, von Humboldt had two passports in hand upon arriving in Acapulco, one from the Council of the Indies and the other from the First Secretary of State, both giving largely unrestricted and unsupervised freedom to travel and collect data (von Humboldt, 1815, pp. xi, 41-43). He nonetheless wrote Viceroy Iturrigaray from Acapulco to ask for permission to conduct scientific research in New Spain (Leitner, 2000; von Humboldt 1970, p. 142, 1980, pp. 107-108).

With the viceroy's encouragement, von Humboldt spent the next year traveling throughout central New Spain even though his instruments were in disrepair and he was eager to return to Europe (von Humboldt, 1970, p. 142). In fact, at least according to a letter he wrote on 29 April 1803 to the botanist Carl Ludwig Willdenow, von Humboldt remained in New Spain a full year rather than sailing from Veracruz during the summer of 1803 only because he feared the insalubrity of that port during the rainy season, when yellow fever gripped the Gulf lowlands (von Humboldt, 1980, p. 113). Nonetheless, he made an enormous number of firsthand observations and collected many unpublished statistics and maps in that year of research. By the beginning of 1804, he had accomplished enough to present a synthesis to Viceroy Iturrigaray, namely a manuscript entitled "*Tablas geográficas políticas del Reino de Nueva España, que manifiestan su superficie, población, agricultura, fábricas, comercio, minas, rentas y fuerzas militares*" (Archivo General de la Nación, Mexico City, Ramo Historia, vol.72, 2ª parte, exp. 24, ff. 271-294; von Humboldt, 1970, 1980, pp. 125-126). Also, by February 1804, the winter dry season had granted the Gulf lowlands their annual respite from yellow fever. And on 7 March 1804, von Humboldt, Bonpland, and Montúfar sailed from Veracruz for the United States by way of Cuba.

Published correspondence from the beginning and end of that year in New Spain demonstrates that while von Humboldt's purpose was in part basic scientific research, he also intended to contribute to development. His January 1804 letter to Viceroy Iturrigaray that accompanied the "*Tablas geográficas políticas*" illustrates how thoroughly von Humboldt believed that science should be applied as policy.

In dealing with me regarding various works that I have carried out in this Kingdom, Your Excellency has deigned to hint that I should send him some interesting materials for the governance of these vast dominions. This hint for me has been an order with which I have complied so enthusiastically that my travels have had no other aim than to contribute with my findings to the public good that occupies no one in these parts more than Your Excellence (von Humboldt, 1980, pp. 125-126; author's translation of Spanish original).

That sentiment echoed the 1803 letter with which Viceroy Iturrigaray had responded to von Humboldt's request for a passport, which not only lauds his dedication to the sciences but also to "the welfare of humanity and other commendable aims" (von Humboldt, 1970, p. 142; author's translation of Spanish original). That desire to apply basic research to development, so clearly established while conducting the research in New Spain, became even more fully realized in the *Political Essay*.

Von Humboldt's Political Essay on Mexico

On returning to Europe, von Humboldt took up residence in Paris and began to prepare his journals for publication under the uniform title of *Voyage aux régions équinoxiales du nouveau continent fait en 1799, 1800, 1801, 1802, 1803 et 1804, par Alexandre de Humboldt et Aimé Bonpland*. Mainly due to financial constraints, the original publication plan changed several times, much confusing the project's history (Leitner, 2000; von Humboldt, 1815, pp. xvii-xxiv). Prepublication of fascicles, excerpts, parallel editions in pricey and economical formats, authorized and unauthorized translations, and non-uniform titles and inconsistent title pages all add further confusion to the Humboldtian bibliography. Nonetheless, despite having moved from Paris to Berlin in 1829, he had published thirty-four volumes of *Voyage aux régions équinoxiales* by 1838. His attention then turned to *Kosmos*, the first volume of which appeared in 1845.

Several volumes of *Voyage aux régions équinoxiales* treat Mexico to some degree. *Recueil d'observations astronomiques, d'opérations trigonométriques et des mesures barométriques*, however, merely records the instrumental observations (von Humboldt, 1810a). *Vues des Cordillères et monumens des peuples indigènes de l'Amérique* juxtaposes images and descriptions of precolonial art and architecture with those of landscapes, some of them Mexican (von Humboldt, 1810b). But while the form of *Vues des Cordillères* suggests much about von Humboldt's ontology, such as his belief that the precolonial peoples of the Americas were part of nature, it contains little of direct relevance to the Gulf lowlands.

Only the *Political Essay on the Kingdom of New Spain*, the volumes of which form the third part of *Voyage aux régions équinoxiales*, directly focuses on what was soon to become the republic of Mexico. Humboldt originally published the *Political Essay* as a series of seven fascicles, with the first one appearing in 1808 and the entire set collected in 1811 into two volumes and an atlas, a year after the Grito de Dolores and a decade before the final victory over Spanish sovereign power that ushered in (post)colonial Mexico. The uniform title was *Essai politique sur le royaume de la Nouvelle-Espagne avec un atlas physique et géographique, fondé sur des observations astronomiques, des mesures trigonométriques et nivellemens barométriques* (von Humboldt, 1811). It incorporated the "Tablas geográficas políticas" he had presented to Viceroy Iturrigaray in 1804 but greatly expanded the non-tabular sections with material from his journals.

Perhaps for that reason he never published the planned fourth volume of the *Relation historique du voyage aux régions équinoxiales*. . . , which comprises the first section of the first part of *Voyage aux régions équinoxiales* and is usually translated into English as the *Personal Narrative of Travels to the Equinoctial Regions of the New Continent, During the Years 1799-1804* (e.g., von Humboldt, 1815, 1941). The three published volumes of the *Relation historique* narrate the

journey in South America and Cuba. The planned fourth volume, treating the journey in Mexico, was apparently abandoned while in press (von Humboldt, 1941, pp. vii-viii). Pratt (1992, p. 129) believes that von Humboldt found personal travel narratives so "repugnant" that he idealistically cancelled the printing at the last minute. But maybe the *Essai politique* had simply grown so popular that von Humboldt and the publisher pragmatically decided that a fourth volume of the *Relation historique du voyage* on Mexico would be redundant and lose money. And the *Essai politique* certainly was popular, resulting in a revised French edition of 1825-27 and numerous translations, including an English edition published by Longman in 1811, a Spanish edition of 1822, and an Italian edition of 1827-29 (Leitner, 2000).²

The *Political Essay* was organized into a Geographical Introduction and six books, themselves divided into a total of fourteen chapters. The Geographical Introduction details the sources for the many maps and other figures, ranging from tables of von Humboldt's own astronomical and barometric observations to lists of manuscript maps and accounts of landscape sketches. Book 1 treats the land of New Spain. Its three chapters describe the colony's territorial extent and political divisions, its coastlines, and physiographic aspects such as soils and climate. Of note, it describes transcontinental routes, the potential for an inter-oceanic canal, and the now classic relationship between climate and elevation: *tierras calientes*, *templadas*, *frías*, and *heladas*. The four chapters of Book 2 concern the people of New Spain: population change; epidemics, famines, dangerous working conditions, and other impacts on population growth; native ethnic groups; and other ethnic groups (European, African, and mixed). It particularly emphasizes the growth in population in the decade since the Revillagigedo census of 1793, the state of the native population, and social inequity in relation to ethnicity. Book 3 consists of a single chapter that describes each of the fifteen territories within New Spain, focusing on surface area, population, and population density. The intendancy of Mexico receives as many pages as all of the other fourteen territories combined. The fourth book treats the prospects for agricultural and mining development in three chapters. Chapter 1 deals with the different crop plants and their many varieties, Chapter 2 with the different animals; and Chapter 3 with the different minerals and the methods of mining them. It describes at length the details of different mining techniques, reflecting von Humboldt's experience as a mine manager in Silesia. Book 5 has a single chapter that deals with the prospects for manufacturing and commerce. Of note, it emphasizes that a lack of factories necessitates the importation of goods. That situation, concludes von Humboldt, reduces the amount of capital available to develop a domestic manufacturing sector. The two chapters of Book 6 describe, in turn, state revenues and military defense. Lengthy notes, supplements, and an index follow the sixth book. In all, even without including the detailed index, the four-volume Longman edition of 1811, which includes small reproductions of some of the plates from the atlas of the 1811 French edition, runs to 1,833 pages—quite an *essay*.

Besides being a turgidly wonderful compilation of detailed data on late colonial New Spain, the *Political Essay* is, according to Donald Brand (1959, p. 123), "the first modern regional economic geography. . . , concerned primarily with the sources of wealth and their distribution and utilization." As such, the *Political Essay* is seminal to the emergence of modern economic development planning in Mexico and elsewhere, a canonical text among country-level development reports. For example, the opening paragraph of the World Bank's 2001 development report for Mexico

states that, "It has been the privilege of the World Bank to provide incoming Presidential Administrations in its client countries with a comprehensive account of its diagnoses and policy recommendations for the sectors that contribute to the client's development path" (Oliver, Vinh, & Giugale, 2001, p. 1). The *Political Essay* begins similarly, von Humboldt (1966, vol. 1, p. 1) stating his purpose as "an investigation of the causes which have had the greatest influence on the progress of the population and national industry." In a letter to Charles IV of Spain, von Humboldt (1966, vol. 1, p. xvii) is similarly explicit regarding his purpose, ending with the following sentence, "How can we displease a good king, when we speak to him of the national interest, of the improvement of social institutions, and the eternal principles on which the prosperity of nations is founded?"

Moreover, the form of the *Political Essay* parallels the political-economy conceptual framework that became so characteristic of orthodox development theory. The analytic starting point is the so-called natural and human resource base and its geographical variation, which is exactly how von Humboldt begins the *Political Essay* with Books 1 through 3. Discussion of the recommendations for development then proceeds sector by economic sector, just as von Humboldt addresses the primary through tertiary sectors in Books 4 and 5. That conceptual framework then culminates with an analysis of the social capacity to implement those recommendations, exactly in the way that von Humboldt concludes the *Political Essay* with Book 6 by providing an analysis of the capacity to govern New Spain. Emphasis might have shifted to developing the quaternary sector and building the capacity of civil society, but the structure of the *Political Essay* nonetheless parallels that of (post)colonial development reports.

Yet, as anyone but an idealist would agree, von Humboldt based his *Political Essay* in good part on observations of landscapes, and therefore that text partially derives from the colonial material/conceptual transformations of those landscapes and subsequently became involved in their (post)colonial transformations (Sluyter, 1997). Understanding the linkages among von Humboldt, unworldment, and undevelopment therefore requires analysis of specific landscapes in relation to the text of the *Political Essay* (Sluyter, 2001). The next section therefore focuses analysis on the Gulf lowland landscapes, proceeding from the precolonial to the colonial to the (post)colonial.

TRAVELING/WRITING GULF LOWLAND LANDSCAPES

Von Humboldt traveled across the Gulf lowlands in early 1804 on his way from Xalapa to the port of Veracruz, where he, Bonpland, and Montúfar embarked for the USA by way of Cuba. By then, that region's landscapes had undergone nearly three centuries of unworldment and undevelopment (Figure 2).

Developed Precolonial World

In contrast, when Hernán Cortés arrived at Veracruz in 1519, he and the other conquistadors had encountered densely settled and productively developed landscapes that manifested a precolonial world (Sluyter, 2002, pp. 35-60). Zempoala,

a city of a hundred thousand inhabitants, occupied the top of a settlement hierarchy with a total population of some half a million in an area of about 5,000 square-kilometers (Figure 3). Those people had developed several types of intensive agriculture attuned to the highly seasonal precipitation regime of the subhumid climate, including sloping-field terracing, intensive wetland agriculture and, probably, some canal irrigation systems of limited extent.

The terraces occupied the piedmont slopes, occurring in complexes of hundreds of hectares. The chronology of those fields and their precise extent both remain elusive, but farmers seem to have constructed them by clearing fieldstones into lines parallel to slope contour. Beyond field clearance, the terraces functioned to manage soil moisture, essential given the climate. The principal food crop was maize, with cotton and agave grown for fiber.

Intensive wetland agriculture covered several thousand hectares of the belt of backswamps just inland from the cordon of dunes along the coast. Although the precise extent and chronology of the wetland fields also both remain uncertain, farmers seem to have constructed the fields by ditching into and mounding above ground surfaces that seasonally intersected the water table. The most general function involved regulation of soil moisture in the rooting zone to allow maize cropping as early in the dry season as possible yet retain enough water for splash and subirrigation well into the dry season.

Figure 3. The Gulf lowlands with locations of places, routes, and field vestiges mentioned.
 Source: after Siemens, 1990, fig. 1; Sluyter, 2002, fig. 2.6.

Colonial Unworldment and Underdevelopment

With rapid and near total depopulation during the early colonial period, on the scale of ninety-nine percent by the end of the sixteenth century, the Gulf lowlands underwent a process of material/conceptual landscape transformation that resulted in drastic underdevelopment and unworldment (Sluyter, 2002, pp. 143-185). The interaction of precolonial land use and climate had created a matrix of cultural savanna with patches of settlement and agriculture by the early sixteenth century. That material landscape patterning together with landscape concepts and laws diffused from Spain through the Antilles constituted the parameters for the Spanish vision of a pastoral landscape based on an economy of livestock ranching. Over the course of the sixteenth century, native depopulation due to epidemics of introduced diseases created a moribund landscape, thickets invading former fields and settlements before the livestock. As the ranchers accumulated space and increasingly occupied the landscape after mid century, they preempted the recovery of the surviving native population.

Epidemiological and old-field succession processes thus resulted in a material landscape pattern that together with the conceptual landscape pattern inherent in such categories as "wasteland" mediated further landscape transformation. The recategorization as wasteland of both moribund and fallow fields belonging to native communities obscured the native labor that had developed those landscape patches,

that would have provided the basis in Spanish law to prevent dispossession, and that would thus have made possible the recovery of native population and reversal of old-field succession. In effect, a positive feedback loop linked the material and conceptual transformations to render them inexorably unidirectional, resulting in the taken-for-granted belief that an undeveloped, unworlded, pristine landscape was progressing toward a productive, developed landscape when, in fact, the opposite was occurring.

By the late colonial period, when von Humboldt traveled the royal highway from Xalapa to Veracruz, the piedmont and wetlands had become well established as poles in a system of regional transhumance. Tens of thousands of cattle grazed the wetlands during the dry season, retreating to the higher and drier piedmont with the onset of the rains. Settlement was sparse, with one nineteenth-century observer noting that neither "towns nor villages are found in these extensive districts, but merely here and there the solitary farms of the cattle-proprietors, or of the herdsmen" (Sartorius, 1961, pp. 9-10). The precolonial world had disappeared along with its native inhabitants and the knowledge of how they had over many generations productively developed the landscapes of their place. A local version of the pristine myth prevailed.

Von Humboldt, far from refuting that pristine myth at the end of the colonial period, reinvigorated it by not acknowledging the dense precolonial settlement and productive development of the Gulf lowlands. He did acknowledge that precolonial population was higher and land use more intensive than in 1804.

Chalchihucuecan (Vera Cruz), all the country from the river of Papaloapan (Alvarado to Huastecapan) [Papaloapan (Alvarado) jusqu'à Huastecapan], was better inhabited and better cultivated than it now is (von Humboldt, 1966, vol. 2, p. 254).

But relative to the highlands, he characterized the lowland population as low in both precolonial and colonial times.

However, the conquerors found as they ascended the table land [plateau] the villages closer together, the fields divided into smaller portions, and the people more polished [police] (von Humboldt, 1966, vol. 2, p. 254).

Collected together on a small extent of territory, in the center of the kingdom, on the very ridge [plateau] of the Cordillera, they have allowed the regions of the greatest fertility and the [sic] nearest to the coast to remain waste and uninhabited. . . . In this the Spanish conquerors have merely trod in the steps of the conquered nations. The Aztecs, originally from a country to the north of the Rio Gila, perhaps even emigrants from the most northern parts of Asia, in their progress towards the south never quitted the ridge of the Cordillera, preferring these cold regions to the excessive heat of the coast (von Humboldt, 1966, vol. 1, pp. 89-90).

If indictment requires opportunity, von Humboldt certainly did not lack evidence to refute the pristine myth, both textual and landscape evidence (Sluyter, 2004). In terms of texts that demonstrated the dense settlement and productive development of the precolonial Gulf lowlands, he spent much of 1803 "in the intellectual and scientific communities of Mexico City, where he studied existing corpuses on natural history, linguistics, and archaeology" (Pratt, 1992, p. 136). The primary texts of that body of literature included eyewitness accounts of late precolonial landscapes written by conquistadors. They also included compilations of precolonial and early colonial histories that members of the clergy collected and codified during the sixteenth

century, when a greater proportion of the precolonial corpus had still escaped the destruction and depopulation of the colonization process.

The most pertinent of the eyewitness accounts by conquistadors are the *Historia Verdadera de la Conquista de la Nueva España* by Bernal Díaz del Castillo (1986), the *Cartas de Relación* by Hernán Cortés (1988), and *La Conquista de México* by Francisco López de Gómara (1987), Cortés's biographer. All contain evidence that refutes the pristine myth for the Gulf lowlands, yet von Humboldt assiduously avoided that evidence even while using those same three texts to support other points he makes in the *Political Essay*. Díaz's reaction upon riding into Zempoala for the first time provides one example of the type of evidence von Humboldt ignored.

[Entering] among the houses, on seeing such a large city, and having seen no other larger, we greatly admired it, and how it was so luxuriant and like a garden, and so populous with men and women, the streets full of those who had come out to see us (Díaz del Castillo, 1986, p. 76).

Similarly, von Humboldt read some of the sixteenth-century compilations of precolonial and early colonial histories, which preserved at least some of the precolonial corpus of codices and oral histories. The Codex Mendoza, a copy of a register of tribute levied on the provinces of the Aztec empire, provides one example that he drew on, even reproducing some of its pictographs in *Vues des Cordillères* (von Humboldt, 1810b, pp. 284-291 and plates 58-59, 1966, vol. 2, p. 18). The Codex Mendoza includes the tribute for the province of Cuertlaxtlan, which encompassed the port of Veracruz and environs, the Spanish glosses noting an annual tribute of 6,720 loads of cotton mantles, 200 loads of cacao, and various luxury items. Such evidence should have made clear to von Humboldt, at least in qualitative terms, the intensive cultivation and dense settlement of the late precolonial Gulf lowlands.

Monarquía Indiana by Juan de Torquemada (1969), written beginning in 1592 and first published in 1615, provides another example of such textual evidence (Franch, 1973). Von Humboldt (1966, vol. 2, pp. 18, 74) cited both *Monarquía Indiana* and Francisco Clavigero's 1780-81 *Storia Antica del Messico*, which itself reiterates much of Torquemada (Clavigero, 1780-81, 1917; Ronan, 1973). Yet von Humboldt ignored the evidence that both texts provide regarding the precolonial Gulf lowlands being anything but pristine, such as an account of the origins of Zempoala and a description of its environs as densely populated (Clavigero, 1917, vol. 2, p. 25; Torquemada, 1969, vol. 1, p. 278). Torquemada (1969, vol. 1, pp. 251, 396; author's translation of Spanish original), in fact, claimed that Zempoala was a grand city with a population on the order of "twenty-five to thirty thousand *vecinos*," large buildings, broad avenues, and many houses with lush gardens—"altogether appearing a delightful paradise." Since *vecinos* refers to heads of households, the total population would have been 4.5 times as great, some 112,500 to 135,000 (Sluyter, 2002, p. 44). Other such references suggest a late precolonial population of some half a million for the region as a whole (Sluyter, 2002, p. 47; Torquemada, 1969, vol. 1, p. 522).

Clearly, using such texts to reconstruct precolonial populations requires awareness and correction for their inherent biases (Sluyter 2002, pp. 41-47). Among the primary texts, Cortés might have estimated population rather liberally to exaggerate his accomplishments and the potential for colonization. Torquemada inflated even Cortés's estimates. Díaz, in contrast, explicitly attempted to counter such exaggeration with his *Historia Verdadera*.

Moreover, among von Humboldt's secondary sources, some clearly bastardized the primary texts while others were explicitly engaged in polemics related to early Creole patriotism. Torquemada, for one, praised precolonial antiquity and Mexican nature, a patriotism that would become the reasoned, Enlightenment nationalism of the later eighteenth century (Florescano, 1994, p. 187). Clavigero, for example, on whom von Humboldt relied more than any source other than Cortés, drew disproportionately on Torquemada in order to counter the eighteenth-century thesis that the Americas were naturally inferior to Europe. That so-called *querelle d'Amérique* stemmed from Buffon's claims about the poverty of American nature and society relative to Europe but became popularized through such publications as Cornelius de Pauw's 1768 *Recherches Philosophiques sur les Américains* and William Robertson's 1777 *History of America*, both of which Clavigero directly attacked (Clavigero, 1917, vol. 2, pp. 431-449; Florescano, 1994, pp. 189-191; Glacken, 1967, pp. 680-685; Pratt, 1992, p. 120).

Yet if clear cases of polemical hyperbole caused von Humboldt to doubt the veracity of the available textual evidence, he should not have so entirely ignored those sources when they contradicted the pristine myth for the Gulf lowlands at the same time that he relied so much on them to support some of his other conclusions in the *Political Essay* (Sluyter 2004). Moreover, the references to the dense settlement of the precolonial Gulf lowlands should certainly have encouraged him to look for the presence or absence of corroborating landscape evidence along the highway between Xalapa and Veracruz.

Yet he did not visit even the ruins of Zempoala, a precolonial city of some 100,000 people. Francisco Lorenzana's 1770 *Historia de Nueva España*, which von Humboldt otherwise cites repeatedly in the *Political Essay*, roughly provides the location of Zempoala's ruins (Lorenzana, 1980, p. 49; von Humboldt, 1966, vol. 1, p. xxxi). An excursion of less than twenty kilometers off the highway would have allowed von Humboldt to visit the ruins of a large precolonial city that, because of rapid depopulation and a relative lack of fighting during the early sixteenth century, remained well preserved compared to the city of Tenochtitlán, which the Spaniards had demolished and rebuilt as Mexico City. Yet von Humboldt did not even mark Zempoala's location on his map of the Gulf lowlands and thereby helped to obscure its location until rediscovery circa 1880 by Estefania Salas (Strebel, 1883).

Moreover, von Humboldt acknowledged nothing of the vestiges of precolonial intensive agriculture along the highway. Certainly, at ground level, the vestigial wetland fields appear as no more than subtle topographic and vegetational variations. So despite the highway running right beside several complexes of wetland fields, they disappeared from the conceptual landscape between 1560—when Lucas Hernández noted "a small lake which appears in the rainy season. . . and marshes ditched straight southward" (Archivo General de la Nación, Mexico City, Ramo Mercedes, vol. 15, ff. 191v)—and the 1970s, when Alfred H. Siemens (1980) noted their characteristic vegetational patterning while flying into the Veracruz airport. Moreover, von Humboldt (1966, vol. 4, p. 154) seems to have left the royal highway where it crosses the Río de la Antigua and instead proceeded to Veracruz by way of the town of La Antigua and the coastal route. He might therefore have never even been within sight of a complex of vestigial wetland fields, difficult in any case to distinguish from ground level.

While an aerial perspective also makes the sloping-field terraces more evident, other visitors to the Gulf lowlands, also German and also limited to a ground-level view of the landscape, reported the vestiges just a few years after von Humboldt failed to do so. Carl Sartorius arrived in Mexico in 1824 and published *Mexico: Landscapes and Popular Sketches* in 1858, providing a clear description of the precolonial terraces.

When the tall grass is burnt down, we can see that the whole country was formed into terraces with the assistance of masonry, everywhere provision had been made against the ravages of the tropical rains; they were carried out on every slope, descending even to the steepest spots, where they are often only a few feet in width (Sartorius, 1961, p. 10).

Brantz Mayer (1847, p. 11) and Hugo Fink (1871, p. 373), two other nineteenth-century travelers from Germany, similarly reported the vestigial terracing.

So von Humboldt, the quintessential field scientist, should certainly have recognized those terrace vestiges, as well as the extensive ruins of precolonial settlement that Sartorius also reported: "On the dry flat ridges the remains of large cities are found, forming for miles regular roads" (Sartorius, 1961, p. 10). After all, von Humboldt crossed the lowlands in late February, when the dry season was far enough advanced for the deciduous vegetation to have lost its leaves and the grass to have withered. The highway passed through extensive complexes of vestigial terraces. And the ranchers would have been burning the range, their fires exposing the characteristic rows of stones running along slope contours.

Instead, von Humboldt not only accepted the pristine myth for the Gulf lowlands, he was generally negative about their agricultural potential. He characterized the precolonial Gulf lowlands as populated, albeit sparsely relative to the highlands, and undeveloped relative to their potential. He characterized the colonial Gulf lowlands as even more sparsely populated than precolonially and undeveloped relative to their potential. And he implied that since native peoples and Spanish colonizers had failed to develop the Gulf lowlands beyond extensive cattle ranching, in his view a waste of their potential, European colonists not subject to what he believed to be lassitude caused by the tropical climate would have to implement intensive agriculture (von Humboldt 1966, vol. 2, pp. 253-256, vol. 3, p. 101, vol. 4, pp. 154-156).

Less clear than the lack of rigor in the use of textual sources and field observations that resulted in such conclusions, are the proximate causes of that lack of rigor. Pratt (1992, pp. 136-137) contends that because von Humboldt spent so much time immersed in the scholarly community of Mexico City, his writings heteroglossically incorporated the voices of his Creole informants, autoethnographically reflecting their representations of themselves. He thereby transculturated those representations into existing European representations of New Spain (also see Florescano, 1994, pp. 204-205). And following independence, (post)colonial Mexican elites reimported their own ideas as scientific, "*European knowledge* whose authority would legitimate Euroamerican rule" (Pratt, 1992, pp. 136-137; italics in original). The republican elites then used ideas such as the pristine myth to continue to disempower those whom they continued to colonize, namely native peoples.

The actual process involved in such autoethnography related to, perhaps most basically, the overwhelming emphasis on the Basin of Mexico (the location of Mexico City) and the Aztecs in the texts von Humboldt relied on, such as the *Cartas de Relación*, Codex Mendoza, *Monarquía Indiana*, and *Storia Antica del Messico*. That bias obscures the more scattered and limited information on the Gulf lowlands. Perhaps von Humboldt did, as Pratt suggests, reach his conclusions on the basis of what Mexican scholars told him and merely selectively skimmed the primary texts for corroborating rather than contradictory evidence. Perhaps he even entrusted Montúfar, who was fluent in Spanish, to locate such passages (Pratt, 1992, p. 240). Ferreting out the brief passages relevant to the Gulf lowlands requires long hours of careful reading, and systematic content analysis of the texts indicates that von Humboldt never took the time to be that careful, either in Mexico City or later in Paris (Sluyter 2004).

Yet von Humboldt's reputation as an avid field scientist and keen observer suggests that he should have used landscape evidence as an independent source to support or refute the ideas of his Creole informants. Careful field observation would have mitigated the autoethnographical tendencies of research based on texts and informants. As with the textual evidence, the process involved again seems to relate to not taking the time for careful, rigorous observations. Von Humboldt and his companions took only two days to travel from Xalapa to Veracruz, seemingly too preoccupied with the threat of yellow fever to carefully observe lowland landscapes before hurriedly departing New Spain (Sluyter, 2004).

(Post)colonial Misdevelopment and Misworldment

People began to resettle the Gulf lowlands in number only after the agrarian revolution that ended the dictatorship of Porfirio Díaz, when von Humboldt's twentieth-century scions, the (post)colonial development planners, would repeat his error regarding the precolonial landscape (Sluyter, 2002, pp. 191-202). In 1910, as the Porfiriato (1876-1911) neared its end, haciendas focused on ranching controlled most of the Gulf lowlands, with 78% of the population of 62,589 living in and around the port of Veracruz itself. By 1990, land redistribution had broken up some of the large estates and population had increased to 776,066, with some 61% in and around the port of Veracruz and around 250,000 spread over the rest of the region and beginning to approach precolonial population densities.

That process of resettlement has hinged on a radical hydrological transformation that epitomizes the egregious failures of such projects in Mexico, the birthplace of the Green Revolution as well as (post)colonial development more generally (Sluyter, 2002, pp. 196-199). Over the course of the late 1930s through the early 1970s, development planners created a network of dams, pumps, irrigation canals, and drainage ditches to convert the colonial pastoral landscape into an agricultural one, at least in part. That agriculture, however, is dominated by exotic biota, domesticated in Asia and brought to the Americas by Europeans for export as commodities. Native food crops such as maize and beans to feed Mexicans occupy mere landscape interstices. The planners thought of themselves as engaged in a heroic battle against the limitations of climate, topography, hydrology, and so-called traditional culture

(Siemens, 1998, p. 213; Skerritt Gardner, 1993, p. 17). In their discourse, development would require that ranching give way to intensive, irrigated agriculture just as the pristine precolonial landscape supposedly had given way to ranching during the colonial period. The "nasty tropical swamps" were "too wet" and "poorly drained," the encompassing coastal plain and piedmont "too dry" for much of the year. The planners would homogenize the seasonality of climate and hydrology through irrigation and drainage.

On the one hand, in ignoring the potential of precolonial native ecologies such as sloping-field terracing and intensive wetland agriculture, the planners accepted von Humboldt's characterization of the precolonial Gulf lowlands as relatively pristine. On the other hand, they also ignored those like Sartorius who had recognized precolonial development.

Pratt (1992, pp. 133-135) provides a critical insight into how a process she refers to as "archaeologization," and which she credits in large part to von Humboldt, rationalized the contradiction between acknowledging precolonial development and ignoring it as a model for (post)colonial development. She notes that in von Humboldt's writings on the precolonial peoples of South America,

the links between societies being archaeologized and their contemporary descendants remain absolutely obscure, indeed irrecoverable. . . . The European imagination produces archaeological subjects by splitting contemporary non-European peoples off from their precolonial, and even their colonial, pasts. To revive indigenous history and culture as archaeology is to revive them *as dead*. The gesture simultaneously rescues them from European forgetfulness and reassigns them to a departed age (Pratt, 1992, p. 134).

Archaeologization thus glorifies precolonial native peoples to the exclusion of living ones (Florescano, 1994, pp. 192-195; Pratt, 1992, pp. 136-137).

Although Pratt credits von Humboldt with legitimizing archaeologization as scientific, she recognizes that he derives the method from the nationalistic Creole scholars of the late colonial period, such as Clavigero. In the same way that von Humboldt autoethnographically incorporated so much else into the *Political Essay*, giving the biases of Creole nationalists the credibility of science, he systematized, improved on, and legitimized their method of archaeologization.

The first step in that method disparages contemporary natives.

The American Indians, like the inhabitants of Hindostan, are contented with the smallest quantity of aliment on which life can be supported, and increase in number without a proportional increase in the means of subsistence. Naturally indolent, from their fine climate and generally fertile soil, they cultivate as much maize, potatoes, or wheat as is necessary for their own subsistence, or at most for the additional consumption of the adjacent towns and mines (von Humboldt, 1966, vol. 1, p. 119).

Because of the lack of evidence for such "natural indolence," he did not espouse such negative conclusions categorically, however, typically employing the trope of self-critique and restraint to ensure his authority as an objective scientist.

I deliver this opinion, however, with great reserve. We ought to be infinitely circumspect in pronouncing on the moral or intellectual dispositions of nations from which we are separated by the multiplied obstacles which result from a difference in language and a difference of manners and custom (von Humboldt, 1966, vol. 1, pp. 170-171).

Having thus established the, at least, suspicion that living native peoples are inherently unproductive, the second step in the logic of archaeologization attributes the accomplishments of precolonial native peoples to diffusions from the so-called Old World.

I do not mean to discuss here what the Mexicans were before the Spanish conquest; this interesting subject has been already entered upon in the commencement of this chapter. When we consider that they had an almost exact knowledge of the duration of the year, that they intercalated at the end of their great cycle of 104 years with more accuracy than the Greeks, Romans, and Egyptians, we are tempted to believe that this progress is not the effect of the intellectual development of the Americans themselves, but that they were indebted for it to their communication with some very cultivated nations of central Asia (von Humboldt, 1966, vol. 1, pp. 158-159).

Given the lack of evidence for such pre-Columbian diffusions, though, scientific archaeologizers take a third logical step to ensure the dominance of western ideas over native ones. That final step characterizes living natives as so degraded that they bear no resemblance to their accomplished precolonial ancestors. In that view, even if precolonial Mexicans had any knowledge that could contribute to (post)colonial development, living natives have not inherited that knowledge.

To give an accurate idea of the indigenous inhabitants of New Spain, it is not enough to paint them in their actual state of degradation and misery; we must go back to a remote period, when, governed by its own laws, a nation could display its proper energy; and we must consult the hieroglyphical paintings, buildings of hewn stone, and works of sculpture still in preservation, which, though they attest the infancy of the arts, bear, however, a striking analogy to several monuments of the most civilized people (von Humboldt, 1966, vol. 1, p. 140).

Such archaeologization became a prime method for (post)colonial elites to become non-European while at the same time accelerating the westernization of their newly independent republics (Pratt, 1992, p. 175). Their nationalistic indigenist rhetoric, or *indigenismo* reconciled retention of the pristine myth with glorification of the precolonial past by celebrating Aztec military heroes and the monumental architecture and art of the long-gone Classic Maya—albeit always measured against western benchmarks such as those of Classical Antiquity (Sluyter, 2002, p. 201). Thus the Maya become the Greeks of the New World and the Aztecs become the Romans. Meanwhile living natives and their land-use practices became categorically “traditional,” supposedly trapped in a “culture of poverty”—with “race of poverty” lurking in the conceptual shadows—that makes them too conservative to actively participate in economic development models that focus on the diffusion and adoption of western institutions and technologies (Lewis 1966). The vestiges of precolonial agriculture, just beyond the pale of touristic ruins, remain largely unseen, unsung, and irrelevant.

Sartorius—scientist, entrepreneur, and promoter of German settlement in newly independent Mexico (Mentz, 1990, pp. 22-45)—provides an example. He believed that the vestiges of precolonial terracing demonstrated that the soil and climate of the Gulf lowlands would support cultivation of tropical commodities such as coffee and sugar cane, that the ranching established during the colonial period wasted that potential, and that immigration by westerners was necessary to realize that potential. In order to reconcile the contradiction inherent in using evidence of precolonial

development to promote (post)colonial development by westerners rather than natives, he ascribed the terrace vestiges to an antiquity so ancient, and perhaps even to Biblical migrants, as to lose all relation to living natives

Nevertheless this region has a peculiar charm for men of an enquiring turn. Traces of extinct tribes are here met with, of a dense agricultural population, who had been extirpated before the Spaniards invaded the country. . . . All is now concealed by trees or tall grass; for many miles scarcely a hut is built, where formerly every foot of land was as diligently cultivated as the banks of the Nile or the Euphrates in Solomon's time. We know not whether a plague or hunger, or warlike tribes from the North, or some great convulsion of nature destroyed the numerous population, indeed we have not the slightest clue, which would enable us to decide to what people these relics of great industrial activity belong (Sartorius, 1961, p. 10).

Apparently late precolonial peoples and their living descendants were incapable of having developed such a productive landscape, and pre-Columbian diffusions from the West might well explain the vestiges of dense settlement and intensive agriculture.

An impartial consideration and observation of the Indians during many years forced me to the conclusion: that, according to their bodily organization, they are incapable of so high a degree of intellectual development as the Caucasian race. . . . The religious systems of the Incas and Aztecs, their knowledge of astronomy, works of art, and mechanical labours for the purposes of every-day life, are the result of their powers of understanding, of the undeniable imitative talents of the whole race. . . . As yet we know not whether influences from the east may not have sown the first seeds of civilization (Sartorius, 1961, p. 64).

(Post)colonial Reworldment and Alternative Development

Given that centuries-long process of unworlment, the (post)colonial development planners who followed von Humboldt and Sartorius easily ignored the potential of precolonial ecologies to inform development and, instead, implemented extreme westernization, a policy that on the basis of its deleterious results had already by the 1970s begun to seem like misdevelopment. By then it had become clear that development theorists' faith in westernization had not improved social well-being and, moreover, had made society subject to environmental degradation on an unprecedented, global scale (Meadows et al., 1972). That double failure stimulated alternative development models under the general rubric of sustainability. One of them focuses on heterogeneous native ecologies—the ecological knowledges and practices of the very cultures that the West colonized and long dismissed as too traditional to participate in development—as the major source of alternatives to homogenizing westernization (Sluyter & Siemens, 2004a).

In the Gulf lowlands, therefore, the contemporaneous recognition of the long-elided vestiges of precolonial intensive wetland agriculture stimulated an attempt by INIREB (Instituto Nacional de Investigaciones sobre Recursos Bióticos) to re-implement that native ecology. In 1968, Siemens observed wetland patterning from a small plane over Campeche, 500 kilometers east of Veracruz, and recognized the significance (Sluyter, 1994). Over the 1970s, he and others made many more such sightings to the east and west, revealing thousands of hectares of wetland fields along the flanks of the Yucatan peninsula and in the environs of Veracruz. To

archaeologists, those vestiges suggested that lowland precolonial population densities had been much higher than previously believed. To INIREB, now defunct but then headquartered in Xalapa, intensive wetland agriculture became a primary component in a plan for the sustainable development of Mexico's tropical lowlands (Gómez-Pompa et al., 1982).

In INIREB's view, that native ecology promised to alleviate the situation of many lowland farmers who had access only to wetlands that were unsuitable for Green Revolution crops, which tend to require level, well-drained land suitable for irrigation. If the many wetlands of the Gulf lowlands could become productive components of integrated farms that produced high yields—high per unit of area, not necessarily high per unit of labor—of food crops, then rural people would be able to significantly increase their well-being and not be forced to migrate to a desperate existence in the burgeoning cities. Such integrated farms would, in INIREB's vision, emerge from the wetlands that misdevelopment had marginalized. And they would do so not by draining them but by modifying them in a way that sustained their hydrology and biodiversity.

Yet while growing recognition of the vestiges of precolonial wetland agriculture in the lowlands stimulated INIREB's project, the *chinampas* of the highland Basin of Mexico provided the model for construction and function. The ostensible reason for the application of a highland native ecology to the lowlands was that scientists have struggled to understand the construction and function of the lowland wetland fields because none remain extant (Sluyter, 1994). Clearly they were a way of manipulating soil moisture in places otherwise too wet to crop, at least for part of the year. But whether the planting platforms were raised above the original surface or represent remnants of that surface left between the canals, whether dams controlled water levels or not, whether planting surfaces seasonally flooded or not, what crops had been grown, how nutrients had been cycled, how much construction and function varied in time and space, and nearly every other issue remains, to some degree, under investigation. In contrast, the *chinampas* constitute the main extant example of intensive wetland agriculture, albeit much reduced from their sixteenth-century extent, and research has determined a model of *chinampa* construction and function as well as suggesting their sustainability over several millennia (Sluyter, 1994). Canals separate planting platforms built up out of alternating layers of lake mud and vegetation. Willow trees line the edges of the platforms to stabilize them. Platforms range around ten meters in width and one hundred meters in length. The water in the canals dampens temperature fluctuations, thus mitigating frost damage, subirrigates crops by infiltrating the platforms, and harbors fish. Mud from the canal bottoms provides fertilizer. Overall, the *chinampas* have a rectilinear plan, with ranks of rectangular fields separated by canals on which boats carry produce to market. Such features combine in a labor-intensive system to produce sustainably high yields.

INIREB thus used the *chinampas* as the model for redeployment of precolonial intensive wetland agriculture in the lowlands, with consequent negative results. During the 1970s and early 1980s, INIREB worked with farmers from the Basin of Mexico to build *chinampas* in Veracruz and Tabasco (Gómez-Pompa et al., 1982). Near the ruins of Zempoala, INIREB built an experimental field complex at its La Mancha research station in order to study biodiversity, nutrient cycling, yields, labor

intensity, and other issues. The most ambitious project, however, was the Camellones Chontales of Tabasco—part experiment, part demonstration, and part CBNRM (Community Based Natural Resource Management). Backers included state and federal governments, the IAF (Inter-American Foundation), the INI (Instituto Nacional Indigenista), and the community of Chontal natives who would farm the fields. The project was so ambitious in scale that instead of manually building up fields out of alternating layers of mud and plants, INIREB employed large mechanical dredges to build sixty-five platforms, called *camellones*, each about thirty meters across and one hundred to three hundred meters long. The Chontales themselves did not participate in the construction, only in the subsequent farming.

The Camellones Chontales did not meet expectations. In 1987, Mac Chapin, then of Cultural Survival, an organization that advocates for the rights of native peoples, surveyed several INIREB projects, including the Camellones Chontales. He claimed that the *chinampa* model had "seduced" INIREB to the point of blinding it to seriously flawed assumptions (Chapin, 1988a, 1988b, 1991). A series of miscalculations seemed to support his conclusions. The *chinampa* model, while indigenous to Mexico, diffused from the highlands to the lowlands with the same discouraging results as westernization because, most basically, lowland field vestiges are so different from the *chinampas*. The former have much smaller platforms, interconnected in labyrinthine, curvilinear patterns, occur in backswamps, and their surfaces probably flooded every wet season, bringing an increment of nutrients and drowning pests and weeds. The *chinampas* have large rectangular platforms, occur in lakes, and their surfaces do not flood annually. Even discounting that the *chinampa* model has no precedent in the precolonial lowlands, the use of dredges in the construction of the Camellones Chontales inverted the soil profile, burying fertile lake mud beneath infertile clay and necessitating application of large amounts of organic matter and fertilizer to achieve acceptable yields. The dredges had also made the canal bottoms so irregular that the Chontales could not use their dragnets to fish. The crops, mainly vegetables grown on the Basin of Mexico *chinampas*, were exotic to the Chontales and oriented to market rather than subsistence. And the great diversity of lowland insects required large amounts of insecticide—only adding to the project's failings.

CONCLUSIONS

Development theory requires improvement so that it can begin to provide a basis for policies that actually improve social and environmental well-being in Mexico and other countries. Key to such improvement will be integration of culture theory and political-economy theory in a way that reveals the linkages between unworldment and undevelopment. Only then will reworldment be as possible as it is essential to the redevelopment of places undeveloped by colonialism and misdeveloped by (post)colonialism.

To reiterate and emphasize that point through illustration, even INIREB's intention to base sustainable development on a native ecology instead of on westernization went awry because of the complex, long-term process that interwove unworldment, undevelopment, von Humboldt's influence, and the

material/conceptual transformation of landscapes—not only those of the Gulf lowlands, but those of the Basin of Mexico. As in the Gulf lowlands, (post)colonial misdevelopment of the Basin of Mexico accelerated in the twentieth century (Ezcurra 1990a, 1990b). The population of Mexico City increased from 137,000 in 1800, to 541,000 in 1900, to 13.8 million in 1980, much of that growth being due to migration from rural Mexico caused by agricultural misdevelopment. Mexico City's built-up area increased in parallel to that population growth: from 10.8 square kilometers in 1800, to 27.5 square kilometers in 1900, to 980.0 square kilometers in 1980. Drainage has virtually dried up the lakes that dominated the precolonial basin, causing the aquifer that supplies the city to fall in level by more than nine meters and become polluted by wastewater. Water shortages are chronic, with about 30% of water consumed in the basin being pumped in over the mountains from neighboring drainages. The salinized soil of the dry lakebeds, already noted by von Humboldt (1966, vol. 2, pp. 170-171) in 1803, prevents all but some poor halophytic pasture from growing; consequently, dry-season dust storms blow salt and clay particles contaminated with sewage into the city. Moreover, as the clays on which Mexico City rests dry and contract, infrastructure sinks. Even the drainage system is sinking and thus decreasing in gradient and efficiency. During the late precolonial period, some 10,000 to 20,000 hectares of *chinampas* existed, about half of them in Lake Texcoco around Tenochtitlán and the other half in Lake Xochimilco and Lake Chalco (Sluyter, 1994). By von Humboldt's visit only a small fraction survived, even fewer by the twentieth century (Armillas, 1971). The Basin of Mexico thus epitomizes (post)colonial misdevelopment.

Despite that failure, the UN (United Nations) organizations directly concerned with development, the World Bank and UNDP (United Nations Development Program), do not consider the millennia of knowledge manifest in the surviving *chinampas* to be relevant to development. Instead, in 1987 UNESCO (United Nations Educational, Scientific, and Cultural Organization) designated the "Historic Center of Mexico City and Xochimilco" as a "World Heritage Landscape" in recognition of its precolonial and colonial architecture and because the *chinampa* system, its last few hectares barely surviving in the shrunken remnant of Lake Xochimilco, "testifies to the efforts of the Aztec people to build a habitat in the midst of an unfavorable environment" (retrieved 9 October, 2003, from whc.unesco.org). The UN organizations responsible for development thus ignore the *chinampas*, except perhaps as a tourist attraction. And the UN organization responsible for culture archaeologizes the *chinampas*.

Current development efforts, dominated by political-economy theory, as is manifest in the division of labor between the UNDP and UNESCO, make the archaeologized *chinampas* unavailable for application to development within the Basin of Mexico. Yet, through that same archaeologization process, the *chinampas* become part of Mexico's romanticized Aztec heritage and thereby become available for application to development of such supposedly hostile environments as the Gulf lowlands. For INIREB, as for Sartorius before, the precolonial vestiges of intensive agriculture in the Gulf lowlands merely suggested the possibility of (post)colonial development. The actual model for such development had to come from elsewhere: for Sartorius, from Europe; for INIREB, from the ancient Aztecs—those supposed Romans of the New World.

Recent developments at FAO (United Nations Food and Agriculture Organization) suggest some hope for the integration of culture theory into development. The FAO, which has responsibility for some agricultural aspects of development, has begun to become involved in research, preservation, and applications regarding so-called GIAHS (Globally-Important Indigenous Agricultural Heritage Systems) such as intensive wetland agriculture around Lake Titicaca in the Andean highlands (retrieved 19 January, 2004, from www.fao.org). There, local Quechua and Aymara farmers have revamped more than a hundred hectares of long abandoned, intensive wetland fields (Erickson and Candler 1989; Erickson 1992). Scientists provided an initial model for field construction and function, but the local farmers have implemented and incrementally adjusted that model. The project has accomplished both of its goals: an experimental test of construction and cultivation techniques hypothesized on the basis of excavations of precolonial fields, and the production of bumper crops of (truly) postcolonial potatoes.

Only a much broader effort to integrate culture theory and political-economic theory as well as the functions of such organizations as the UNDP and UNESCO will result in better development theory and application. Such integration has the potential to explain the processes through which colonialism and (post)colonialism have unworlded precolonial worlds and apply that understanding to development that actually improves social and environmental well-being in a (truly) postcolonial world (Sluyter & Siemens, 2004b).

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NOTES

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² Throughout, quotes come from the 1966 AMS Press facsimile edition of the 1811 Longman edition of the *Political Essay* (von Humboldt 1966), translated into English from the French edition of 1811 by John Black, because that facsimile enjoys wide accessibility. I have, nonetheless, checked all passages critical to the analysis against the 1811 French edition and, as appropriate, indicate any differences of significance in brackets.

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