

# Race Betterment and Tropical Medicine in Imperial San Francisco

At six o'clock on the morning of February 20, 1915, San Francisco was engulfed by a cacophony of sounds. To signal the opening of the Panama-Pacific International Exposition (PPIE), the fire department rang its bells and whistles, automobilists honked their horns, policemen banged on trolley poles, and, just in case anyone was still asleep, the fife-and-drum corps paraded through the streets.<sup>1</sup> A few hours later, under a bright sky, an entourage of politicians and merchants headed by Mayor James Rolph Jr. and Governor Hiram Johnson led a two-and-a-half-mile-long procession from Van Ness Avenue and Broadway to the marina. At the vanguard of this parade was a small cavalry, followed by six carriages of pioneers, "men that had seen the city grow from a few shacks at the edge of a cove that has long since disappeared."<sup>2</sup> These dignitaries congregated at the Tower of Jewels, beneath a ceiling that depicted the heroic saga of the Panamanian isthmus, from the voyages of the Spanish conquistadors to the US Canal Commission.<sup>3</sup> The president of the fair's board of directors, Charles C. Moore, along with a local rabbi and minister, welcomed the crowd and congratulated the city on its marvelous achievement. Unable to attend, President Woodrow Wilson sent Franklin K. Lane, the secretary of the Interior. Deeply impressed by what he saw, Lane intoned to the crowd, "The seas are now but a highway before the doors of the nations," and connected the benevolence of US imperialism to the unstoppable march of westward expansion: "The greatest adventure is before us, the gigantic

adventure of an advancing democracy, strong, virile, and kindly, and in that advance we shall be true to the indestructible spirit of the American Pioneer.”<sup>4</sup> The fair did not officially commence, however, until President Wilson, three thousand miles away, pressed a golden key linked to an aerial tower in Tuckerton, New Jersey, whose radio waves sparked the top of the Tower of Jewels, tripped a galvanometer, and closed a relay, swinging open the doors of the Palace of Machinery, where a massive diesel engine started to rotate. Minutes later, Moore notified President Wilson via telegraph that the first world’s fair to begin wirelessly was under way.<sup>5</sup>

A grand extravaganza that had been envisioned before the devastating earthquake of 1906 and for which planning had begun in 1910, the PPIE was organized to commemorate the completion of the Panama Canal, a project directed by the United States and finished in 1914. Held near Fort Mason in San Francisco, the fair covered 635 acres, a substantial portion of which had been leased from the military.<sup>6</sup> After passing through its turnstiles, visitors entered a vast “city of domes,” filled with courts, palaces, towers, pavilions, and concessions, whose epic proportions and evocative style had been designed by architects such as Louis Christian Mullgardt and Bernard Maybeck.<sup>7</sup> An event extolling the myriad technological advances that imbued the twentieth century with the promise of perfection, the PPIE unfolded, sometimes discordantly, as brutal trench warfare killed thousands in Europe. When the exposition closed ten months later, on December 4, with lavish festivities that included a concert by the Philippine Constabulary Band, the reading of a toast sent by President Wilson, the sounding of bugles, and evening fireworks, nearly nineteen million people had passed through the PPIE’s turnstiles.<sup>8</sup>

For the fair’s coordinators and local elites, the staging of the PPIE in their westernmost city was no coincidence but rather the culmination of the inexorable and forward march of progress. As one of many promotional pamphlets declared, “California marks the limit of the geographical progress of civilization. For unnumbered centuries the course of empire has been steadily to the west.”<sup>9</sup> In keeping with the theme of the advancement of civilization, the PPIE prominently showcased recent developments in agriculture, manufacturing, science, technology, architecture, and the arts. One subject that received an enormous amount of time and space was health and disease, especially the areas of race betterment and tropical medicine. Indeed, the fair’s official poster, the “Thirteenth Labor of Hercules,” symbolized the intertwined significance of these two concerns and provided an iconography for the

apotheosis of empire, race, and sanitary intervention that crowned San Francisco as the Jewel of the Pacific. The poster features a muscular man in his physical prime, seen from the back, as he forces apart Panama's Culebra Cut; the PPIE's iridescent lights shimmer at the Canal's vanishing point.<sup>10</sup> If this figure embodied sheer masculine might, it was also a metaphor for the success of tropical medicine, which strove to rid the world's hot and humid regions of insect- and waterborne diseases in order to make them hospitable for Europeans and European Americans. With its veneration of the extraordinary white body, the poster reflected the racial hierarchies of Victorian anthropology and social Darwinism that had saturated international expositions since the late 1800s and helped ideologically to justify colonial ventures across the globe. The "Thirteenth Labor of Hercules" glorified sanitary engineering in the tropics at a time when the underlying tenets of race and disease were being reconfigured in light of new theories of human heredity and health.

The PPIE occurred at a transitory moment, as biology and medicine were becoming beholden to reductionism and new perspectives on disease identification and causation. Environmental explanations of human degeneracy and sickness, influenced by neo-Lamarckian doctrines of the inheritance of acquired traits and miasmatic principles of contagion, still dominated in some corners. They were being supplanted, however, by less flexible theories of germs and genes that demanded exact diagnoses and targeted solutions. On the one hand, for more than a decade, tropical medicine, which combined bacteriology, parasitology, and entomology, had concentrated on isolating and attempting to eradicate the etiologic agents of infections caused by microbes, helminthes, and protozoa, as well as intermediary disease vectors, such as mosquitoes, flies, and lice.<sup>11</sup> On the other hand, biology and the incipient field of genetics were increasingly dependent on Mendelian theories of hereditary transmission and "upward causation" models of molecular interaction.<sup>12</sup> Concomitantly, clinical medicine saw the enthroning of organ-based specialties and the beginnings of subspecialization. The PPIE took place in the midst of this trend toward reductionism, as more malleable conceptions of health and disease were buckling under the power of the microscope to make visible what was hidden to the human eye, the impulse toward quantification, and the elaboration of specific prophylactic measures for specific conditions.

Tropical medicine and race betterment differed in terms of their objects of analysis and the consequences of their hygienic therapies:

public health authorities could achieve their goal of ending a plague outbreak by destroying the culpable carriers, rodents, yet eugenicists rarely saw any immediate or even desired results from their attempts at manipulation. Nevertheless, both fields emerged during a reconstellation of the diagnostic, therapeutic, and heuristic role of medicine in modern society. Furthermore, what connected the two was an often-shared vocabulary of racial degeneracy and fitness. Thus, in one seamless sentence, scientists at the fair could applaud activities ranging from rat poisoning to better babies contests. Either way, the potential impact of deleterious germs and genes could be contained or controlled. More often than not, the accompanying corollary was a belief in the constitutional and mental superiority of Anglos and Caucasians and the limited reasoning abilities and foul habits of virtually all other racialized groups.<sup>13</sup>

The proximity of race betterment and tropical medicine at the PPIE belies the separation that some scholars have erected between eugenics and public health, contrasting them as incompatible, insofar as the former emphasized the propagation of the “fittest” and the elimination of those deemed degenerate, while the latter strove to save and extend lives by bringing the advantages of health to all. Instead, as the PPIE demonstrates, the early twentieth century was a period in which diverse and seemingly contradictory initiatives could mingle under the Progressive banners of improvement, efficiency, and hygiene, with all being motivated by the idea that the application of wide-ranging scientific knowledge could optimize American society. Thus in the 1910s public health and eugenics crusaders alike moved with little or no friction between calls for school vaccinations, for the teaching of “scientific motherhood” to women, for classification of human intelligence, for immigration restriction, for the promotion of the sterilization and segregation of the “unfit,” and for the passage of marriage laws. Later in the century, academic professionalization and heightened specialization—whether in the laboratory, clinic, or office—would create more defined niches for these various kinds of initiatives.

It was during this transitional moment, in the context of a spectacular tribute to San Francisco’s place in the US imperial cartography and under the spell of racial hierarchies, that California’s burgeoning eugenics movement coalesced, acquiring a multifaceted agenda and the potential for attracting a broad social membership. At meetings convened during the PPIE, a heterogeneous group of sanitary experts, zoologists, horticulturalists, medical superintendents, psychologists, child advocates, and anthropologists established a social network that would

influence eugenics on the national level in the years to come. Furthermore, the exposition provided an arena where well-known Progressives such as David Starr Jordan, Luther Burbank, and Paul Popenoe articulated a hereditarian vision apposite to California, a vision that in short order would become a formidable force in the state's laws, landscapes, institutions, and politics.

#### COLONIAL CIRCUITS

Like the World's Columbian Exposition, held in Chicago in 1893, the PPIE was made possible by industrial and urban expansion that stretched far beyond San Francisco into the resource-rich hinterlands of California and the American West.<sup>14</sup> The fair's water was supplied via aqueducts from remote watersheds, its electricity was generated by recently built regional networks of hydropower, and much of its raw building material, such as lumber, was felled or extracted in distant forests and fields and then shipped on freight trains along serpentine tracks from the North, South, and East.<sup>15</sup> The overlapping grids of infrastructure that fed San Francisco, helping to make it the most populous city in the US West by 1900, took shape rapidly in the second half of the nineteenth century, propelled by conquest, statehood, and the Gold Rush. In addition, the establishment and fortification of military bases around San Francisco Bay, which was part and parcel of the heightened US navalism of the 1890s, was a critical dimension of this growth.<sup>16</sup> In the eyes of elite San Franciscans, military preparedness, geographical location, and an indomitable spirit made the city the obvious gateway to the Pacific, particularly to the Philippines, where California financiers pictured untouched gold mines and the lucrative cultivation of export crops. During the 1890s, San Francisco publications regularly beat the drum for an empire launched from California shores.<sup>17</sup> A 1900 editorial in *Overland Monthly* titled "The Subjugation of Inferior Races," for instance, energetically embraced the colonization of the Philippines as part of a new "national policy" that followed "along the line of British domination" and necessitated "the gradual subjugation of these weaker groups of people by the stronger and more highly civilized powers."<sup>18</sup>

By the early twentieth century, San Francisco's coming prominence was being linked not only to accentuated militarism and colonial desires but also to revived calls for a Central American canal, which would augment trade on the West Coast and extend the geopolitical reach of the United States. Without a navigable passage across the isthmus in the

mid-nineteenth century, thousands of gold seekers had perished, primarily because of epidemic scourges and unforgiving territory, en route to California from the Gulf Coast via Panama. Moreover, when summoned to war in 1898, the battleship *Oregon*, fabricated in San Francisco's shipyards, had no choice but to proceed fourteen thousand miles around Cape Horn, a voyage that took more than two months.<sup>19</sup> The existence of a Central American canal would forever do away with such obstacles and usher in a technologically modern century.

The construction of the Panama Canal unfolded against the backdrop of the Spanish-American War and the installation of American colonial rule in Cuba, Puerto Rico, the Philippines, Guam, and Hawai'i. Through a series of adroit and manipulative political maneuvers, orchestrated by President Theodore Roosevelt, Panama seceded from Colombia and the Canal Zone was transferred from the French to the United States.<sup>20</sup> In 1903, after the signing and congressional ratification of the Hay-Bunau-Varilla Treaty, the Isthmian Canal Commission was formed to govern the Canal Zone "in perpetuity" and to oversee the gargantuan assignment of carving a waterway through the rocky, bug-infested jungle.<sup>21</sup> For the next decade, as tens of thousands of West Indian, European, and American laborers excavated more than 230 billion cubic yards, blasted massive boulders, and built dams and locks, the United States attempted to run its newly obtained "unorganized possession" meticulously and methodically. In many ways, the Canal Zone functioned as a laboratory of US colonialism. The daily routines of work and leisure, and their attendant racial and class demarcations, were rigidly scripted and policed.<sup>22</sup> Interlaced with militaristic and moralistic surveillance were rigorously implemented measures of disease prophylaxis that tracked the movement of all living organisms—humans, insects, and rodents. After the waterway opened, many isthmian sanitary engineers returned to the continental United States, bringing the techniques they had honed in Panama to bear on public health ventures; their initial stop was San Francisco.

#### THE DREAM OF A "CITY BEAUTIFUL" AND THE NIGHTMARE OF PLAGUE

As soon as the first ditch was dredged in Panama, the San Francisco businessman Reuben B. Hale launched a campaign claiming that his city would be the ideal home for a major exhibition to mark the completion of the canal. The city's merchant associations, along with the

Society for the Improvement and Adornment of San Francisco and the California Promotion Society, were persuaded by Hale and endorsed his recommendation. Vexed by aspersions cast on their city from the East Coast, the local elite had become enamored of the “City Beautiful” movement. Eager to imitate the best of Washington, D.C., and New York City, while pointing up San Francisco’s captivating topography, the city’s business leaders asked the eminent urban planner Daniel Burnham to draft a blueprint for an awe-inspiring metropolis.<sup>23</sup> Burnham drew up an “imperial city” that boasted an acropolis atop Twin Peaks, “colonnaded shelters and temple-like edifices, courts and terraces,” nine arterial boulevards radiating outward from the civic center, wide steps that cascaded down hillsides, and elegant and sweeping parkways.<sup>24</sup> The prospects for this Romanesque dreamscape were crushed, however, by bitter infighting among merchants and politicians and, more calamitously, by the deadly earthquake that rocked the Bay Area and set the city aflame in 1906.

Nonetheless, for many elite San Franciscans, with destruction came the possibility of renewal. Immediately after the earthquake, Hale, Charles C. Moore, the owner of prosperous hydroelectric enterprises and president of the Chamber of Commerce, and William H. Crocker, the son of Charles Crocker and one of the “big four” barons of the trans-continental railroad, redoubled their commitment to hosting a world’s fair. Even if Burnham’s “City Beautiful” had become financially and politically unfeasible amid the rubble, the splendor of San Francisco could still materialize and be revealed to all at the PPIE. Thus, in 1909, at a dinner convened by Hale at the Bohemian Club, about twenty businessmen reiterated their intentions and formed a board of directors. Moore was named president, and by 1910, despite fierce competition from San Diego and New Orleans, he had secured congressional approval for the exposition.<sup>25</sup>

The PPIE quickly became the medium for rebuilding a more magnificent San Francisco, which would rise like a phoenix from the ashes and prove that the city deserved to stand at the apex of an empire that straddled two oceans and controlled the world’s most heavily trafficked waterway. The PPIE managers were keenly aware that their success was contingent on portraying an image of San Francisco as ordered and virtuous. This entailed debunking San Francisco’s reputation as a sybaritic haven teeming with “flagrant houses of prostitution,” especially in the Barbary Coast and Tenderloin districts. Given the city’s history of lax enforcement of regulations on prostitution, alcohol consumption,

and gambling, especially in comparison with Los Angeles, this was a tall order for PPIE organizers, who were under relentless pressure from antivice groups to “clean up” the city.<sup>26</sup> In addition, it meant demonstrating that San Francisco was salubrious and free of disease. Having served as chairman of the executive committee of the Citizens’ Health Committee in 1908, Moore was well versed in the idioms and methods of disease control.<sup>27</sup>

In 1907 bubonic plague had reappeared in San Francisco, taking the lives of several dozen white residents. In response, the mayor, worried about an impending quarantine against the city, founded the Citizens’ Health Committee. Composed of civic leaders and medical officers, this committee was charged with eradicating bubonic plague in San Francisco. The mayor and local officials were eager to reverse the negative attention the city had attracted in 1900, when a bungled quarantine had demonized Chinese immigrants by sealing off Chinatown and scapegoating its residents.<sup>28</sup> This incident not only was motivated by Sino-phobia and racist associations of the Chinese with contagion but also revealed a profound lack of coordination between municipal, state, and federal health agencies.

With firm resolution and guided by the latest medical findings about the etiology and epizootic transmission of plague, the Citizens’ Health Committee set out to kill each and every rat in the city, even if that meant house-by-house fumigation and the placing of poison and traps along every block.<sup>29</sup> In contrast to the earlier outbreak, health officials knew that they would prevail only if citizens were disabused of the misconception that plague was solely an “Oriental disease” exclusive to Chinatown.<sup>30</sup> Thus the committee embarked on a massive educational campaign that strove to teach all San Franciscans about the essential roles of the rat and the flea in the spread of *Yersinia pestis*. Week after week, public health workers scoured every street, residence, shop, wharf, and factory in the city: “Wherever plague was found in rat or man, a horde of rat catchers descended on that place and trapped every rat for four blocks around to prevent the hunted animals from carrying the infection any farther.”<sup>31</sup>

One year later, this offensive had succeeded. The fumbling between different agencies that had characterized the 1900 debacle had been replaced by a much more streamlined approach in which federal sanitary officers, affiliated with the US Public Health Service (USPHS), were in the lead, clearly vested with more clout than their municipal and state counterparts. Although anti-Asian sentiment was still pervasive, the

fact that Chinatown accounted for only two cases attenuated the intensity of medicalized Sinophobia in San Francisco, at least with respect to plague.<sup>32</sup> In addition, the success of the campaign underscored the increasing importance of the laboratory in the precise identification of bacilli. In this case, USPHS facilities near the Presidio and on Angel Island received and tested a steady stream of dead rats, more than one million of which were killed from 1908 to 1909.

To a great extent, this concerted antiplague effort functioned as a dress rehearsal for the PPIE and helped elevate health and disease to the top of the exposition's list of concerns. Many of the key players in the two ventures were the same. Moore, for example, presided over both undertakings, convincing local merchants and organizations to donate money, buy bonds, and pay special taxes to fund each of them.<sup>33</sup> Furthermore, the USPHS officers who directed plague eradication—John Hurley, William Rucker, and, most important, the surgeon general, Rupert Blue—were the medical men contacted when sanitary arrangements for the fair began.<sup>34</sup> Finally, just as the Citizens' Health Committee's activities were coming to a close, Frank Morton Todd, the author of its official report, *Eradicating Plague from San Francisco*, began to compile the hundreds of boxes of materials he would use to write five hefty tomes on the PPIE.<sup>35</sup>

#### RACIALISM ON DISPLAY

To tour the carefully ordered universe of the PPIE was to experience, on a reduced scale, the grandeur of Burnham's "City Beautiful," marked less, however, by the classical and Beaux Arts styles that the Chicago architect favored and more by a Mediterranean eclecticism that mixed Oriental, Moorish, Greek, and Spanish Revival forms. Seeking to convey the natural landscape of California, the painter James Guerin had decided on a pastel color scheme for the PPIE that mirrored "the hues of the sky and the bay, of the mountains, varying from deep green to tawny yellow, and of the morning and evening light."<sup>36</sup> Visitors remarked that this palette, when suffused by indirect lighting in the evening, lent the fairgrounds an ethereal luminosity.<sup>37</sup>

The aim of the built environment of the PPIE, like that of the Columbian Exposition of 1893 and the St. Louis Exposition of 1904, was to embody allegorically the mythos of the American Century. In San Francisco, the terminus of the US West and the springboard to the Pacific, this meant the presence of artifacts such as *Fountain of Energy*, a strong male

mounted on horseback with his arms spread out and crowned by figurines of "Fame" and "Valor." Referred to by its creator as the *Victor of the Canal*, this sculpture symbolized "the vigor and daring of our mighty nation, which carried to a successful ending a gigantic task abandoned by another great republic."<sup>38</sup> Many other monuments, large and small, such as *Adventurous Bowman*, *Energy*, and *Earth*, sought to portray the telos of universal progress that the United States had harnessed for the benefit of all humankind by constructing the canal across the Panamanian isthmus. The trope of hemispheric harmony was also seen in murals such as *Atlantic and Pacific* and *Gateway*, which pictured the two halves of the world meeting at the Panama Canal in a swirl of commerce and human communion.

This tale, however, was one with clear-cut winners and losers. According to many sources, the most popular sculpture, *The End of the Trail* by James Earle Fraser, located in the Court of Flowers, showed an exhausted Indian hunched over a feeble horse—a pathetic figure who was all but defeated by westward expansion and European American settlement. Paired with *The End of the Trail* was *American Pioneer*, housed in the opposite Court of Palms, which provided the inspiration for Secretary of the Interior Lane's opening remarks. Seated astride a horse and alertly holding a rifle, *American Pioneer* personified not the cowboy outlaw found in dime novels of the "Wild West" but a dignified man of reason who was "very typical of the white man and the victorious march of his civilization."<sup>39</sup> The broader cultural and geographical implications of these two faces of the "survival of the fittest" were reinforced by the juxtaposition of two sculptured groups, *Nations of the East* and *Nations of the West*, in the Court of the Universe. The latter centered on a wholesome, fair-skinned, and sprightly prairie girl, called "Mother of Tomorrow," poised in front of an oxen-drawn wagon, and flanked by white boys, a French American trapper, a totem-bearing Alaskan woman, and Americans of Latin, German, Italian, and English descent, as well as a "squaw with a papoose" and an "Indian chief on his pony."<sup>40</sup> Instead of a wagon, at the center of the *Nations of the East* stood an ostentatiously ornamented elephant, ridden by an Arab prince who was accompanied by a mounted sheik, an Egyptian atop a camel, an Arab falconer with a bird, a Tibetan lama, a Muslim, and two black slaves.<sup>41</sup> If the Nations of the East were associated with exoticism, servitude, idolatry, and the excesses of royalty, their Western counterparts personified enterprise, ingenuity, and inter-American solidarity. In the words of the exposition's official chronicler, the *Nations of the West*

statue “was rough and real, and it was also hopeful, buoyant, and progressive. . . . This group expressed the thrusting heave of western ambition and progress.”<sup>42</sup>

As was the case with earlier international expositions, the doctrines of racial and cultural difference expressed by the PPIE’s art and architecture also shaped the experiences and encounters of fairgoers. Broadly speaking, the PPIE was wracked by tensions between inclusion, in the name of international fellowship and trade, which its managers hoped to encourage, and exclusion, as dictated by hierarchies of race, ethnicity, and nation. In some ways, the PPIE broke with convention. For example, in contrast to previous fairs, the PPIE unreservedly welcomed white middle-class female reformers and did not relegate their participation to a separate women’s building. California’s elite women, having gained the vote in 1911, were exceedingly involved in the exposition. Under the leadership of Mrs. Phoebe Apperson Hearst and Mrs. Frederick G. Sanborn, two of the city’s most active reformers, the Woman’s Board partook in many aspects of the fair, hosting lectures, teas, and conferences.<sup>43</sup> Partially owing to their insistence, the PPIE was the stage for vocal peace demonstrations that condemned war as wholesale “organized murder.”<sup>44</sup> Throughout the entire fair, a sizable contingent of learned women asseverated that their maternal instincts and political conscience compelled them to struggle against US entry into World War I, as well as for child welfare, national suffrage, and Progressive legislation.<sup>45</sup>

Spaces comparable to that carved out by elite women were not similarly occupied by racial and ethnic minorities. In a city and state whose restrictive anti-Chinese ordinances and laws supplied templates for the federal Chinese Exclusion Act (1882), the drawing of boundaries by European Americans, whether against or around *californianos*, Mexicans, Chinese, Japanese, and Filipinos, was integral to the fractious settlement and remaking of urban and rural California. Despite proclamations of universal belonging, the PPIE continued this legacy.<sup>46</sup> African American visitors, for example, complained bitterly to fair managers about employment discrimination, and their request that black veterans of the Spanish-American War be hired alongside white guards fell on deaf ears.<sup>47</sup> A lawyer writing on behalf of the Colored Non-Partisan Leagues of California was incensed that African American fairgoers were often barred from centrally located restaurants and were forced to “trudge, and starve while they trudge, mile after mile until they come to some ‘Jim Crow snack house’ or ‘chit’lin’ [chitterling] den.”<sup>48</sup> On the surface, the PPIE managers responded that no color lines were being demarcated. How-

ever, an internal letter, in which a PPIE attorney told Moore that he was confident that “a few tactful words will quiet the fears of these ‘wards of the nation’” reveals the degree of condescension faced by black fairgoers.<sup>49</sup> In addition to these criticisms, nearly a dozen Chinese groups, including the Chinese commissioner general, the owner of the Oriental Hotel, and the Chinese Six Companies, sent a flurry of letters to PPIE offices denouncing the “Underground Chinatown” concession, located on the “Joy Zone,” the fair’s entertainment area. They vociferously objected to what they perceived as a degrading caricature of their culture, represented by a subterranean opium den and an enslaved prostitute. Under pressure to maintain positive diplomatic relations with China in light of the broadened American economic mission in Asia, this concession was temporarily suppressed and eventually replaced with the only slightly less offensively named “Underground Slumming.”<sup>50</sup> In short, celebrating the forging of an empire, shored up by doctrines of racial superiority, was incompatible with the rhetoric of universalism or internationalism. Ultimately, racialism was on display at the PPIE, whether through overt discrimination on the fairgrounds, the fetishized display of “primitive” artifacts collected from the Navajo, the Chippewa, and the Ainu, or the maintenance of “native villages” that featured “live” Indians dancing or making handicrafts.<sup>51</sup>

#### TROPICAL MEDICINE COMES HOME

One of the most popular attractions in the Joy Zone was a model of the Panama Canal with motorized carts that transported people across a five-acre simulacrum of the isthmus. On their journey, phonographic records designed and tested by Thomas Edison broadcasted lectures describing the tremendous feat of building the canal. So impressed was Major F. C. Boggs, chief of the Washington Office of the Panama Canal, that he stated that within half an hour this ride could “impart to anyone a more complete knowledge of the Canal than a visit of several days to the waterway itself.”<sup>52</sup> Functioning as an interactive testament to the American possession of the Canal Zone, this concession implied that only the acumen and industry of US engineers could have tamed an unruly region that had vanquished earlier attempts by the French. Pivotal to this story of the American mastery of the tropics was the sanitary regime instituted by Colonel William C. Gorgas, the medical chief of the Isthmian Canal Commission from 1904 to 1914.<sup>53</sup> Like many officers who served in the Spanish-American War, Gorgas had spent much of the 1880s and 1890s

in the West, in his case Texas and South Dakota, where he simultaneously pursued frontier medicine and territorial administration.

Armed with knowledge of bacteriology and parasitology, health officers stationed in the Panama Canal Zone, affiliated with the US military and the USPHS, sought to stamp out the pernicious ailments that had doomed the dream of a canal across the isthmus in the nineteenth century. Their achievements in the Canal Zone involved replicating the extensive campaigns against both insect- and waterborne diseases waged in Cuba and the Philippines during the Spanish-American War.<sup>54</sup> It was in Havana, as Yellow Jack overpowered the American troops, that Gorgas inaugurated an effective system of epidemiological surveillance and mosquito eradication, reducing cases of yellow fever from fourteen hundred in 1900 to zero by the close of the following year.<sup>55</sup> Gorgas relied—for a good while quite reluctantly—on the prescient observations of the Cuban physician Carlos Finlay, the research results of the US Army physician Walter Reed, and the experiments of the British scientist Ronald Ross, which demonstrated that yellow fever was transmitted by the *Aedes aegypti* (then called *Stegomyia fasciata*) mosquito and malaria by the *Anopheles* mosquito. He imposed a totalizing system that divided Havana into sanitary districts, each overseen by a medical team that kept a detailed inventory of file cards on the status of every house and water source as a potential breeding spot for mosquitoes.<sup>56</sup> After these data were compiled, Gorgas's brigades drained, oiled, or capped all wells, cisterns, and ponds and fumigated homes, often burning bedding and clothing. This novel strategy worked. Within three months yellow fever and malaria had diminished markedly, and nine months later they had all but vanished.<sup>57</sup>

The lessons learned in Havana informed Gorgas's approach in Panama, a more extensive and challenging terrain. Once in the Canal Zone, Gorgas mounted a frontal assault on mosquitoes, which were numerous enough to thicken the air at night.<sup>58</sup> His careful review of the procedures carried out by the French in the 1880s revealed that their dependence on miasmatic principles of disease transmission via filth or "noxious gases" had cultivated an environment ripe for mosquito breeding. For example, at the French-built Ancon Hospital, crockery dishes filled with water were placed beside plants and flowers to ward off ants, thus creating a propitious home for mosquito larvae.<sup>59</sup> Because the French effort to reproduce the Suez Canal in Central America took place before the medical breakthroughs of Louis Pasteur and Robert Koch, and because it instead relied on beliefs that many tropical ailments were caused by

“bad air” or moral depravity, the conditions were ripe for the loss of an estimated twenty thousand lives.<sup>60</sup> Two decades later, emboldened by his Havana campaign and eventually granted substantial financial resources, Gorgas implemented markedly different and efficacious techniques in Panama. He designated twenty-five sanitary districts, each assigned an inspector with a team of twenty to one hundred men.<sup>61</sup> Dozens of sanitary workers initiated drainage projects, conducted house-to-house inspections and fumigation, constructed mosquito coverings and netting, applied kerosene, sulfur, and alcohol to kill mosquitoes and larvae, and cleared and lined ditches and water channels. In 1906, during one month at the height of Gorgas’s antimosquito assault in Panama City, an average of forty-seven men worked long hours cleaning the streets and collecting garbage, while close to a dozen men captured rats and watered the ground to diminish the dust. The *Stegomyia* brigade inspected nearly ten thousand houses, identifying and destroying larvae in 1,785.<sup>62</sup>

Many early twentieth-century commentators averred that the engineering and manual construction of the canal could succeed only because American health officers had managed to turn Panama from a “pest-hole” and “ancient plague spot” into one of the “most healthful spots in the world.”<sup>63</sup> As one source stated, “Colonel Gorgas realized that it was necessary to immediately revolutionize the sanitary conditions of the Canal Zone and that until this was done it would be impossible to proceed with the work with any degree of dispatch.”<sup>64</sup> Beyond proving the unmatched scientific skills of the United States, this transformation affirmed that because insects and germs were the cause of tropical diseases rather than heat and humidity the tropics could be made habitable for whites.<sup>65</sup> In the words of a Boston physician, who spoke before the Massachusetts History Society in 1911 after touring the Canal Zone and interviewing Gorgas, Panama demonstrated that “the white man can live and work in any part of the tropics and maintain good health,” adding that “the settling of the tropics by the Caucasian will date from the completion of the Panama Canal.”<sup>66</sup> Once seen as resulting from pestilential emanations, tropical diseases began to be understood as infections caused by tiny microbes that, with the appropriate laboratory and medical equipment, could be managed through a militarized brand of surveillance, record keeping, and coordinated extermination.

The formation and implementation of tropical medicine in the colonies bolstered the confidence of the Americans, who attributed their

newfound vigor and mobility to their resilient racial makeup and the recalcitrance of certain ailments to the unhygienic customs of “primitive” peoples lower down on the evolutionary ladder who did little or nothing to control pathogens.<sup>67</sup> In the Canal Zone, this translated into a self-fulfilling prophecy because it was the quarters and districts of the whites, engineers and laborers, where mosquitoes were most vigorously attacked. Eradication methods often followed a colonial logic of immunity, where European Americans believed that they required prophylaxis because of a presumed lack of exposure to tropical diseases, while assuming that darker-skinned laborers had usually already acquired resistance, particularly to yellow fever. The sad irony, of course, was both that such theories of racial immunity oversimplified the complexity of disease ecologies and diasporas, and that many times the arrival of European Americans instigated the very conditions that gave rise to epidemics, thus determining the contours and even inventing the field of tropical medicine. In the Canal Zone, the homes of West Indian workers were not systematically screened, standing water was often left untouched in their neighborhoods, and treatment for other, equally deadly diseases, such as pneumonia or dysentery, was given only haphazardly. Thus, in the appendices at the back of President Theodore Roosevelt’s glowing 1906 report on Panama and the wonderful results of the health crusade, the mortality figures actually revealed that “the white worker and his family were indeed faring extremely well; otherwise, for the vast black majority, the picture was alarming.” From January to October 1906, for instance, 17 whites died per 1,000, as opposed to 59 blacks per 1,000. This meant that West Indians were dying three times as fast as whites. Furthermore, from 1904 to 1910, pneumonia killed at least 25 percent of the silver roll workers, who primarily hailed from Jamaica, Barbados, and Colombia.<sup>68</sup> If “it was no longer a whiteman’s graveyard,” it was only slightly “less deadly than it ever had been” for blacks.<sup>69</sup>

The message—of American prowess, medical might, and white superiority—pervaded the PPIE and was frequently applied to the westward settlers who had remade California and catapulted San Francisco to global prominence. In his address titled “The Physician as Pioneer,” the president-elect of the American Academy of Medicine, Dr. Woods Hutchinson, credited the colonization of the Mississippi Valley to the discovery of quinine, which had stymied malaria, and then told his audience that for progress to proceed apace in the current “age of the insect,” the stringent sanitary regime imposed and perfected by Gorgas in the Canal Zone was the *sine qua non*.<sup>70</sup> From opening to closing day,

a chorus acclaiming Gorgas and American colonial sanitation could be heard at the PPIE. As the exposition's official handbook proclaimed: "The completion of this herculean task marks an epoch in the history of the world. A gigantic battle against floods and torrents, pestilence and swamps, tropical rivers, jungles and rock-ribbed mountains has been fought—and won!"<sup>71</sup>

#### THE MANY FRONTIERS OF CLAUDE C. PIERCE

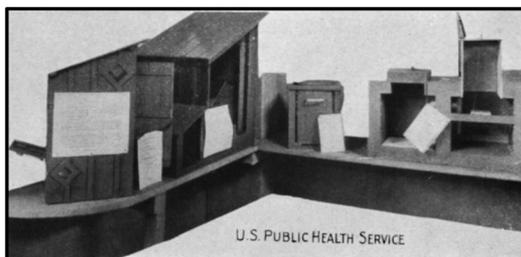
The colonial circuits that linked public health and sanitation in Cuba, the Philippines, and the Canal Zone to the PPIE were busy highways, certainly traveled by Gorgas, but perhaps by no one more than Claude C. Pierce. Born in Tennessee in 1878, Pierce received his degree from Chattanooga Medical College and joined the USPHS in the lower ranks in 1900 after serving in the Spanish-American War. In 1904 he was sent to Panama, where he worked his way up from assistant to senior surgeon, acting first as a quarantine officer and then, starting in 1913, as the superintendent of Colon Hospital.<sup>72</sup> For more than a decade, Pierce fought typhoid, plague, and yellow fever in the Canal Zone. In 1915, he brought this experience in tropical medicine to San Francisco, where he served as chief sanitary officer for the duration of the PPIE.

As a uniformed health officer fresh from the occupation of Panama, Pierce, and his USPHS colleagues, treated the fairgrounds much like a zone under martial law. For instance, when the USPHS arrived on the scene months before opening day, one of its preliminary tasks was to carry out a comprehensive medical census of all persons on the premises according to age, sex, and occupation, evaluate them for hookworm and trachoma, and, if necessary (as mandated by a recently passed USPHS regulation), vaccinate them against smallpox.<sup>73</sup> Once the exposition had begun, Pierce and his underlings surveyed the buildings, scrutinized concession stands, hung antisputting signs on buildings, and assessed the public bathrooms, all the while searching for vermin, locating pools of standing water, and regularly testing the drinking supply for bacteria. For example, for the month of April, Pierce reported that he applied borax to fertilized soil to discourage fly breeding, turned off and oiled water fountains to destroy mosquito larvae, inspected in total 244 concessions and structures, and reinspected the Joy Zone, avenues, and stockyards more than six hundred times, ultimately pinpointing 125 problems that needed fixing.<sup>74</sup> When he found sick individuals, he sent them to the Exposition Hospital, which was run by the USPHS and

operated as both a critical care center and an exhibit. It boasted four wards, an operating room, an anesthetizing room, a waiting room, an X-ray machine, a laboratory, electric massage machines, urine and blood analysis kits, two spiffy Cadillac ambulances, and personnel close to fifteen, including several attending physicians and nurses, technicians, orderlies, and a maid.<sup>75</sup> While the PPIE was being built, the Exposition Hospital tended to injured workers, and from the day the first brick was laid to the last day of demolition, more than seven thousand people were treated or hospitalized, sometimes repeatedly, by the USPHS.<sup>76</sup> The Exposition Hospital also fostered the circulation of modern medical thought at its library, where professionals could peruse a collection of more than one thousand books or borrow from a stereopticon archive of eight thousand lantern slides, many produced during health campaigns in the field.<sup>77</sup>

This demonstration hospital was accompanied by USPHS exhibits, six of which won medals, including one gold medal and one grand prize, from the PPIE's international jury committee.<sup>78</sup> These didactic displays detailed the organization and mission of the USPHS, illustrated epidemiological patterns and surveillance techniques, and even featured a habitat of living breeding mosquitoes.<sup>79</sup> Pierce oversaw all of the USPHS exhibits, the largest of which covered 5,250 square feet in the Palace of Liberal Arts and aimed to present in a "popular and comprehensive way, easily understood by the general public, the latest methods of preventing the common communicable diseases."<sup>80</sup> It highlighted more than a dozen conditions, including typhoid, tuberculosis, rabies, Rocky Mountain spotted fever, and syphilis. Through morality tales (of negligent "silent" carriers, which echoed the melodrama of Typhoid Mary) and positive examples (of wharves properly guarded against rats and securely muzzled rabid dogs), the USPHS instructed its viewers in the basics of bacteriology and made the concealed universe of germs visible through magnified drawings of microorganisms and the anthropomorphism of creatures such as the liver fluke and the whip worm.<sup>81</sup>

Aside from the USPHS sites, fairgoers could tour many other booths that emphasized public health and hygiene (figure 2). In the Palace of Education, the state of New York outlined its sewage disposal system, Baltimore portrayed its methods of water filtration, and the US Children's Bureau foregrounded the virtues of scientific motherhood and pasteurized milk while its contracted physicians examined children and dispensed free child-rearing advice to parents. Throughout the fair, visitors could not witness these medical advances without reference to their colonial



MODELS ILLUSTRATING METHODS FOR THE DISPOSAL OF EXCRETA



MODEL OF A RAT-PROOF VESSEL



MODEL OF A RAT-PROOF HOUSE

FIGURE 2. Demonstration models for controlling plague, from the US Public Health Service exhibit, directed by Claude C. Pierce, at the Panama-Pacific International Exposition, San Francisco, 1915. Source: W. C. Rucker and C. C. Pierce, *United States Public Health Service Exhibit at the Panama-Pacific International Exposition, San Francisco, 1915*. Suppl. no. 27, USPHS Reports (Washington, DC: Government Printing Office, 1915).

connections. For example, not far from the tables on which babies were weighed and measured by the Children's Bureau stood the award-winning Rockefeller exhibit on hookworm transmission, a display sent by the "republic of Cuba" on tropical medicine that underscored "diseases peculiar to the tropics of the Western Hemisphere," and the Philippine Bureau of Health's installation, which aspired to show "the progress made in health conservation and sanitation since the advent of the Americans."<sup>82</sup>

If medical knowledge was absorbed by fairgoers as they walked the palaces, it was articulated and discussed at the more than thirty meetings grouped together during the "Medical and Hygiene Period" in the last two weeks of June. So vast were the numbers, so many the lectures, and so distinguished the figures who journeyed to San Francisco for the occasion that Todd referred to it as "the greatest period of medical conventions in the world's history."<sup>83</sup> That the priorities of tropical medicine dominated these meetings was to be expected at an exposition devoted to the Panama Canal and in a city preoccupied with the specter of plague. As soon as PPIE managers started to map out the event schedule, they began to contact preeminent physicians, asking for their input and collaboration. In 1912, for example, James A. Barr, in charge of conventions and conferences, wrote to Dr. William F. Snow, then director of California's board of health, to request his help in guaranteeing that medical groups sign up for the exposition. Barr began his entreaty: "Tropical diseases are already far too common in San Francisco, and California. With the opening of the Panama Canal we shall have a flood of immigration from Southern Europe, and other parts of the world, bringing all sorts of diseases into our midst. In fact, the opening of the Canal is certain to bring many sanitary problems to the front in San Francisco, and California generally."<sup>84</sup> It was this kind of anxiety, which constituted the flip side of unbridled optimism about scientific advancement, that had prompted Moore to obtain a pledge from Surgeon General Rupert Blue, his ally from the 1908–9 plague eradication campaign, that the USPHS would strictly oversee all sanitary matters at the PPIE. For many physicians and observers, acquiring overseas possessions entailed the tropicalization of the United States, a prospect that in turn demanded full-scale prophylaxis against vectors of ailments such as hookworm and yellow fever and, by extension, those deemed most likely to harbor them. Like the many *fin-de-siècle* anti-imperialists (and cautious imperialists) who feared the incorporation of the "mongrel races" into the body politic, physicians worried about the epidemiological ramifications of colonialism.

Among the organizations in attendance during the “Medical and Hygiene Period” were the Spanish American War Nurses, the Pan-American Medical Congress, the American Medical Association, the Medical Association of the Isthmian Canal Zone, the American Society for Tropical Medicine, and the American Social Hygiene Association, each of which helped put tropical medicine center stage during the last two weeks of June.<sup>85</sup> For instance, Victor C. Vaughan, dean of the University of Michigan Medical School, who had joined forces with Reed and other medical officers during the Spanish-American War to fight typhoid fever, called to order the American Medical Association meeting, which adjourned with the election of Blue as incoming president.<sup>86</sup> According to Helen Dare, a popular *San Francisco Chronicle* columnist, the American Medical Association meeting was one of the “most interesting, important and vital to public welfare” at the fair and provided an opportunity to recognize that the “greatest achievement of modern civilization,” the building of the canal, would have been impossible without the great strides in medical science made by the Americans, especially Gorgas in his brilliant war against mosquitoes.<sup>87</sup>

Blue also took part in the conference of the American Society for Tropical Medicine, which Gorgas had cofounded five years after the annexation of Cuba, Puerto Rico, and the Philippines. Invoking the narrative of medico-military conquest that bridged the Panama Canal and the PPIE, the society’s secretary, John M. Swan, stated that the exposition was

planned to commemorate the connection of the Atlantic Ocean with the Pacific Ocean across the isthmus of Panama. We must not forget that the French would have constructed this canal had it not been for mosquitoes, malaria, and yellow fever. The low forms of life which are responsible for the development of these diseases in the human body and their transmission from man to man are indifferent to race, creed, or social position. It is solely because the sanitary department of the canal commission has made it possible for non-immune men to work without the dangers of acquiring infections of this type that the task has been accomplished.<sup>88</sup>

The scientific skill of the United States was also touted at the Pan-American Medical Congress, where its president, Dr. Charles L. Reed, delivered a lengthy address praising the hemispheric security ensured by the 1823 Monroe Doctrine and “the combined genius of American medical scientists, Latin and Anglican,” in quelling tropical diseases, above all yellow fever, in the Canal Zone.<sup>89</sup>

Nonetheless, behind such declarations of the overarching magnanimity of the United States and its egalitarian leadership in a global quest

against indiscriminate microscopic enemies lay worries about vulnerability and contagion that were entangled with the racialism of the era. In many ways, associations between particular racial groups and diseases were counterintuitive. If bacteriology had shown anything, it was that microbes and their vectors happily transgressed all social and national lines and that, as San Francisco's plague eradication campaign demonstrated, the extirpation of germs necessitated broad-based campaigns in which everyone participated and cooperated. Tropical medicine, however, was deeply connected to the production of colonial and racial difference, so much so that, in the transition from miasmatic to germ theories of transmission, assumptions of the backwardness and pathology of colonized peoples remained largely intact, now seen as the result of unclean habits and even genetic propensity for infection or immunity rather than climate or environment.<sup>90</sup> It is not surprising that at the PPIE, where doctrines of racial superiority and inferiority were ubiquitous—expressed and encountered in murals, statues, concessions, and de facto segregation—a white supremacist interpretation ultimately won the day. For instance, as Reed's lecture ultimately disclosed, his understanding of Pan-American medical progress was based not on a common cause among hemispheric equals but rather on the enlightened effects of "Aryan blood" in American lands.<sup>91</sup> Moreover, for Reed and many of his colleagues, the ultimate goal of the "practical application" of new scientific knowledge was the "betterment of human efficiency through the physical and, consequently, the mental development of the race."<sup>92</sup> Indeed, the biases of tropical medicine, which were already tethered to social Darwinism and Victorian anthropology, insinuated themselves into the race betterment movement during its incipient formation, eventually leaving imprints on eugenics, especially in the American West.

This relationship between tropical medicine and race betterment had layered repercussions in the continental United States, affecting how immigrants often negatively experienced health, illness, and even daily life. In the 1920s, for example, on the basis of the supposition that particular ethnic, racial, or national groups were more likely to be afflicted with certain conditions, fecal samples were routinely demanded of the Chinese who landed at Angel Island to screen for hookworm and other parasites.<sup>93</sup> More directly, the week after the PPIE ended, Pierce was ordered to Laredo, Texas, to investigate several incidents of typhus fever on the border, an inquiry that eventually led to the imposition of a harsh quarantine against Mexico that lasted more than two decades and perpetuated stereotypes of Mexicans as dirty and lousy.<sup>94</sup> Pierce

was instrumental in fusing tropical medicine and race betterment and implementing colonial strategies of disease control and containment throughout the American West.<sup>95</sup> Guided by more than a decade of experience in quarantine and sanitation in Panama, he diligently set up and assiduously directed the USPHS exhibits, scrupulously assessed the grounds for any signs of germs or disease, and shared his epidemiological and experimental knowledge with other practitioners.<sup>96</sup> Undoubtedly, Pierce performed an important public health function at the fair and helped keep potential outbreaks in check. Yet his sanitation work was permeated by developing ideas of eugenics and human difference. For example, in August 1915, Stanford's chancellor, David Starr Jordan, the horticulturist Luther Burbank, and Pierce were the guests of honor at a luncheon hosted by the Race Betterment Foundation.<sup>97</sup> The fact that Pierce availed himself of this opportunity to lecture on typhoid fever and the proper disposal of human excreta suggests the affinity between race betterment and tropical medicine at the PPIE.<sup>98</sup>

“OF THE GREATEST IMPORTANCE TO HUMANITY”

On most afternoons during the fair, at 3:00 p.m. in Theater No. 1 at the Palace of Education Dr. A. J. Read could be found holding forth on topics such as “Heredity and Environment” and “Diet and Health.”<sup>99</sup> When he was done, Read walked back to his headquarters at the Race Betterment booth, where he was “in almost constant attendance to give information and advice.”<sup>100</sup> This exhibit, which won a bronze medal for “illustrating evidences and causes of race degeneration and methods and agencies of race betterment,” made eugenics a daily feature of the PPIE.<sup>101</sup> According to Read, it attracted more than one thousand visitors each day, many of whom returned twice and some of whom returned even six or eight times.<sup>102</sup> It comprised six booths that displayed medical equipment, charts detailing the degenerative effects of alcohol and “race poisons,” rules of healthy living and eating, a list of eugenics organizations, and an assortment of instruments used by physicians to gauge the physiological and biological capacity of humans from conception to adulthood.<sup>103</sup> Among the latter was the “New Laughlin Gytometer” for determining “various hereditary results from parent combinations,” which had probably been devised by the superintendent of the Eugenics Record Office, Harry H. Laughlin.<sup>104</sup> To relieve fatigue and stress, visitors could sit in two battery-operated vibrating chairs typical of the electrotherapy and hydrotherapy offered at John Harvey Kellogg's Battle

Creek Sanitarium.<sup>105</sup> Todd wrote that this display “caught the eye of every visitor.” Echoing PPIE motifs, its statues were “large plaster casts of Atlas, and Venus, and of Apollo, Belvedere type, to advertise the human race at its best, and get that race interested in its glorious past and possible future.”<sup>106</sup>

The presence of this exhibit and of eugenics at the PPIE was a result of the deliberate planning of its managers. In February 1913, James A. Barr, head of conventions and congresses, contacted David Starr Jordan to ask him to help arrange for a major eugenics gathering at the exposition and expressed a willingness to cover the travel costs of some of the participants.<sup>107</sup> Aware that the first international eugenics conference had been held in London in 1912, Barr was interested in holding its successor at the PPIE: “I am still hoping against hope that we may yet be able to bring the International Congress on Eugenics to California in 1915.”<sup>108</sup> Although this never materialized, by calling upon Jordan and communicating with other national figures, Barr was able to fill the PPIE’s calendar with race betterment events.

Barr’s ambitions were shared by Alvin E. Pope, chief of the section on “the Social Economy,” which concentrated on “human improvement” in all its guises. For Barr, the two pillars of social economy were “prevention” and “efficiency,” which he strove to bring to life at the fair to illuminate the “greatest achievement of the centuries—the Panama Canal—a completion made possible by the rigid application of the discoveries in hygiene.”<sup>109</sup> Pope determined to have eugenics play a commanding role at the exposition, arguing that the “exhibits in Eugenics and in Sex and Mental Hygiene” would render the PPIE “absolutely unique” among world’s fairs and related events.<sup>110</sup> For him, showing graphs and dioramas of hereditary disease transmission, social biology, and the menace of the feeble-minded was “of the greatest importance to humanity.”<sup>111</sup>

Both Barr and Pope succeeded in making eugenics matter at the PPIE. Race betterment was a staple concern at the meetings of the American Association for the Advancement of Science and the National Educational Association, where the Stanford psychologist Lewis Terman, his Harvard colleague Robert M. Yerkes, and the psychiatrist Aaron Rosanoff discussed abnormality, intelligence testing, and mental hygiene.<sup>112</sup> They were joined by Henry H. Goddard, who in addition to being the author of the influential book *The Kallikak Family: A Study in the Heredity of Feeble-Mindedness* had several years earlier personally carried a copy of the Frenchman Alfred Binet’s mental test across the Atlantic in order to translate it and administer it at the New Jersey Vineland

Training School.<sup>113</sup> Eugenists also dominated the annual gathering of the American Genetic Association (previously the American Breeders' Association), where about three hundred people attended sessions "devoted to promoting knowledge of the laws of heredity and environment and their application to the improvement of plants, animals, and peoples."<sup>114</sup> On the day before the beginning of the Second National Conference on Race Betterment (SNCRB), the American Genetic Association's Eugenics Section convened. As Paul Popenoe, secretary pro tem of the association and the editor of its *Journal of Heredity*, noted, talks were delivered on the intersection of eugenics and sociology, how to foster a eugenic conscience, the need for broadened sterilization laws, and the medical inspection of immigrants at California ports of entry.<sup>115</sup> In his talk "The Long Cost of War," Jordan propounded the moral and biological costs of military engagement, a message that he repeated at the International Purity Congress, where "he pointed out that the 8,000,000 men who are reported as killed, wounded or missing in Europe are the flower of their country's manhood, and that the degenerate and unfit are left behind to repopulate the warring nations."<sup>116</sup>

Of all the eugenics events, however, the SNCRB was the largest and most important. In 1913, Jordan, Kellogg, and Charles B. Davenport, head of the Eugenics Record Office, had started to exchange letters about the feasibility of arranging a second international eugenics congress in San Francisco.<sup>117</sup> When it became clear that financial considerations and the shadow cast by war in Europe would foreclose this option, Kellogg, fresh on the heels of the First National Conference on Race Betterment, held in his hometown of Battle Creek, Michigan, in 1914, decided that the PPIE would be the ideal site for his organization's next meeting. Jordan pledged his support and, along with more than a dozen others, including Read, Burbank, and A. W. Hoisholt, who was medical superintendent at the Napa State Hospital, he joined the SNCRB's California Committee.<sup>118</sup> Through Jordan, Kellogg hired Herbert R. Stolz, an assistant professor of hygiene at Stanford University, to coordinate the conference.<sup>119</sup> At Kellogg's request, Popenoe assembled a photographic exhibit for the race betterment booths (figure 3).<sup>120</sup> August 4 to 8 was the fair's official Race Betterment Week, when educators, biologists, physicians, and social workers assembled with the intent of launching "a progressive battle for bettering our race."<sup>121</sup>

Over these five days, hundreds of people crowded into the Inside Inn to hear race betterment lectures, and, according to Kellogg, more than three thousand people turned out for the final session at the Oakland



FIGURE 3. Entrance to the Race Betterment Exhibit, sponsored by the Race Betterment Foundation and designed by Paul Popenoe, at the Panama-Pacific International Exposition, San Francisco, 1915. Source: *Official Proceedings of the Second National Conference on Race Betterment* (Battle Creek, MI: Race Betterment Foundation, 1915).

Civic Center, which was capped off by “Redemption, a Masque of Race Betterment,” a theatrical tale about the morality and science of eugenic mating.<sup>122</sup> Pierce, as mentioned, presented on typhoid fever. Jordan spoke yet again on the dysgenic consequences of war, contending that only pacifism could protect the “germ plasm” of the country’s healthiest and most cherished element, young men of fighting age: “A continual killing off at the upper end and a continual breeding from the lower end, lets a Nation down.”<sup>123</sup> Burbank, the cultivator of the Shasta daisy and the Paradox walnut, applied his practical knowledge of plant biology to the problem of race betterment, which, he asserted, depended on a two-pronged strategy: “one by favorable environment which brings individuals up to their best possibilities; the other ten thousand times more important and effective—selection of the best individuals through a series of generations.”<sup>124</sup> Hoisholt, who, as a member of the State Commission in Lunacy, had championed California’s 1909 sterilization law, insisted that the insane should be rehabilitated, not punished. Like many Progressives, he believed that mental patients were best handled by medical, not correctional officers, and that depriving so-called

morons, idiots, and the feeble-minded of their reproductive capacity benefited both the individual and society.<sup>125</sup> Calls for sterilization and the elimination of the “unfit” were also voiced by Popenoe, who decried any attempts to impede natural selection, which he thought was appropriately leading to the extinction of decadent races such as the American Indian. Instead, in the name of civilization and progress, he implored scientists to identify those that were a “burden to the race” as well as the social and medical measures to stimulate race betterment. In his talk “Natural Selection in Man,” Popenoe adumbrated his future advocacy of better breeding, which he would promote in the 1920s after returning to California and embarking on a comprehensive survey of sterilization in state institutions.<sup>126</sup>

Just as insecurity over racial contagion simmered below the surface of tropical medicine, not far beneath the optimism of race betterment lay uncertainty about the United States during a period of unprecedented immigration, urbanization, corporatization, and industrialization. In the preface to the *Official Proceedings* of the SNCRB, for example, readers were warned of the “the rapid increase of race degeneracy, especially in recent times,” and the terrible need to rid the country of millions of degenerates.<sup>127</sup> Kellogg’s answer to the impending threat was the birth of a “real aristocracy made up of Apollos and Venuses and their fortunate progeny.”<sup>128</sup> He calculated that the United States was already suffering under the burden of five hundred thousand lunatics, eighty thousand criminals, one hundred thousand paupers, ninety thousand idiots, and ninety thousand epileptics, and he cited statistics proffered by Davenport and Laughlin that mental defectives constituted at least 10 percent of the population.<sup>129</sup> To save the nation from ruin, Kellogg enumerated twelve measures for race betterment, which included a thoroughgoing health survey to be conducted in every community every five years, free medical dispensaries for the afflicted, the inspection of schools and schoolchildren, health education, prohibition of the sale of alcohol and tobacco, strict marriage laws in each state, and the establishment of experiment stations where experts could devote their energies to investigating the laws of heredity in plants, animals, and humans. His final recommendation was to start a eugenics registry that would take into account three constituencies: those interested in eugenics, those who met eugenic standards, and children born of eugenic standards.<sup>130</sup> For Kellogg, the eugenics registry was essential to the “creation of a new and superior human race” based on Mendelian principles. He made it the hallmark of the SNCRB and was proud of the fact that

Davenport, although absent from the conference, had agreed to sit on the registry's board of directors.<sup>131</sup>

In part, the pessimism about the future that marked the SNCRB reflected the mounting acceptance of Mendelian and Weismannian theories of heredity among eugenicists. Neo-Lamarckian explanations of degeneracy were popular in the United States among many Progressives at the turn of the twentieth century.<sup>132</sup> Indeed, Kellogg's original dual strategy of "euthenics" or personal and public hygiene combined with "eugenics" or race hygiene typified the race betterment agenda in the early 1900s. By 1915, however, "euthenics," which had been in much greater evidence at the 1914 Race Betterment Congress in Battle Creek, began to be seen by many prominent eugenicists as soft, ineffective, and scientifically unsound.<sup>133</sup> It is partly because of such interpretations that Kellogg has been ignored in the eugenics scholarship. While he maintained close friendships with many of the country's most notorious eugenicists such as Davenport, many saw his enthusiasm for vegetarianism, electric baths, enemas, and bran consumption as futile and fanciful. Some commentators at the PPIE in 1915 viewed Kellogg's clamors for a "eugenic aristocracy" as preposterous, and his eugenics registry was also mocked: "That is to say, America can be saved from extinction and insanity by employing a vast army of medical registrars and inspectors, as though to adopt such a policy would not of itself be an evidence of mental deficiency."<sup>134</sup> Dare, the *San Francisco Chronicle* columnist, believed that Kellogg, along with other purists, sought nothing more than to purge society of its entertaining diversity. She wrote acerbically, "When we all are raised to an admirable—but undiverting—level of physical, mental and moral perfection (through the indefatigable efforts of purity leagues, prohibition parties, eugenic societies, anti-swearing, anti-kissing, anti-corset, standing-up-straight, don't-wear-a-hat, vegetarian, fruitarian, granarian, let-your-hair-grow-long, back-to-nature, esperanto, volapuk, mind-your-step organizations), won't our excellent sameness rather pall on us?"<sup>135</sup>

But Kellogg's ideas of race betterment and human improvement persisted for decades, even if the Race Betterment Foundation was soon overshadowed by other eugenic organizations and "euthenics" was relegated to the realms of body culture and therapeutic self-help. Moreover, at the PPIE Kellogg and his foundation functioned as handmaidens, helping to crystallize a eugenics movement that privileged surgical sterilization, marriage laws, immigration restriction, and ever more elaborate ways of counting and classifying the fit and the unfit. The talks by

Popenoe, Jordan, Hoisholt, and Kellogg fostered this metamorphosis. Even Burbank, who had long upheld a belief in the neo-Lamarckian inheritance of acquired traits, was careful to state that heredity was “ten thousand times” more important than environment. The SNCRB was crucial to the formation of a network of heterogeneous reformers, many of whom would lead the eugenics charge in the 1920s. Furthermore, the tenets around which the eugenics movement coalesced in San Francisco in 1915 would have profound effects in the decades to come. The SNCRB consolidated the ties between California eugenicists, not just among an older generation, which included Jordan and Burbank, but also among a young cohort of crusaders, such as Popenoe and Terman, who would direct the state’s main eugenics societies from the 1920s until as late as the 1960s.

Kellogg was supremely pleased with the SNCRB, writing to Davenport soon after that the conference had received more press coverage than any other except for the American Association for the Advancement of Science. Seeking to impress on Davenport the advances made for their shared cause, he wrote, “Your efforts in behalf of eugenics are certainly beginning to bear fruit. The public are beginning to understand better and appreciate more.”<sup>136</sup> Kellogg profusely thanked Jordan for his leadership on the California Committee, crediting him for much of the SNCRB’s success.<sup>137</sup> To repay him, Kellogg extended an invitation to Jordan to spend one month at the Battle Creek Sanitarium. Although subsequent meetings kept Jordan at the PPIE for the rest of the year, he did accept Kellogg’s medical advice, which led to a diagnosis of pronounced diabetes and auricular fibrillation and a lifelong supply of soybean biscuits, carbonates, and yeast extract.<sup>138</sup>

The PPIE closed on December 4, 1915, repeating the fanfare with which it had opened 288 days earlier.<sup>139</sup> By this time it had become clear that the war in Europe would not abate anytime soon. Despite the admonitions of Jordan and the Woman’s Board, the United States was mobilizing and training troops across the Southwest in preparation for action on the European Front. The PPIE was the last of the great colonial fairs; the next exposition in the United States would not be held until 1933, in Chicago. Two more, in New York City and on San Francisco’s Treasure Island, would follow in 1939.<sup>140</sup> The world’s fairs of the 1930s were a different genre—homages to modernist architecture and industrial science that incorporated the wonders of new forms of mass media, such as radio and film. After World War II, the pace of international

expositions slowed considerably. Television and movies had helped to bring entertainment into the home, and airplane travel made it possible for many more Americans to visit the “exotic” places they might have caught glimpses of at world’s fairs fifty years before.

Even if the PPIE represented a culmination of the spectacles inaugurated with the Philadelphia Centennial in 1876, the seeds that were planted in San Francisco in 1915 with respect to health, medicine, and eugenics would sprout in the decades to come. Key figures from the PPIE, such as Pierce and Popenoe, would be instrumental in shaping the racial and sexual order of the American West, Pierce along the US-Mexican border and Popenoe, briefly, on the border and in much more sustained fashion in Southern California. The nucleus of California’s eugenics movement converged at the PPIE, mostly at the SNCRB but at other venues as well. Terman advanced his new version of the Stanford-Binet test at a joint meeting of the American Psychological Association and the American Association for the Advancement of Science.<sup>141</sup> Charles M. Goethe, a Sacramento philanthropist who attended a Playground and Recreation Congress at the fair and was an admirer of Jordan, cofounded the Eugenics Section of the Commonwealth Club of California in 1925 and the Eugenics Society of Northern California in 1933.<sup>142</sup>

Moreover, the PPIE fostered the cross-fertilization of tropical medicine and race betterment at a critical moment of transition in modern medicine in American society. Both were fostered by similar racial doctrines and supported by shifting notions of race, germs, and genes rooted in the identification and illumination of specific disease etiologies that demanded expert intervention and prophylaxis, whether by sanitary brigade or surgical sterilization. Over time, tropical medicine and race betterment would veer apart and become linked to differing scientific and medical agendas. In San Francisco in 1915, however, the theories of race, disease, and degeneracy that infused both domains were still sufficiently in formation to closely intermingle. In any case, they had proven their centrality to narratives about the triumph of the Panama Canal and the promise of American empire in the West and the Pacific.