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Sanitized Modernity: Rural Public Health in Mid-Twentieth Century Khuzestan

Existing histories of public health in Iran often center on elite or urban narratives. This paper shifts the focus to Iran's villages by examining the twentieth century public health history of rural northern Khuzestan. It argues that Khuzestani villagers desired, rather than resisted, modern medical services. However, vertical decision-making and the prioritization given by public health planners to economic concerns over social well-being led to the uneven distribution of services and failure to fulfill the expectations of Khuzestan's villagers. This paper uses memoirs, official reports, correspondence, and other records from the Development & Resources Corporation, along with reports from Iran's Ministry of Education and Ministry of Health, to bring a richer picture of Iranian villagers' twentieth century history into focus.

Keywords: Public Health; Medicine; Khuzestan; Rural Iran; Schistosomiasis; Development; Sanitation

Although plans to institute modern medical services in Iran date back to at least the early nineteenth century, the urban elite and army enjoyed the majority of those services.¹ No general program for addressing rural public health surfaced until the 1950s.

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An earlier version of this article formed a chapter in my master's thesis, "Alienating Iranians from their Environment: Irrigation, Flood Control, and Public Health in Late Pahlavi Khuzestan" (University of Texas at Austin, 2018). I sincerely thank Kamran Aghaie and Faegheh Shirazi for their help and comments at that stage. Another version was presented at the Middle Eastern Studies Association annual conference in San Antonio, Texas on 16 November 2018, at the panel "Science, Medicine, Oral Histories, and Progress in Qajar, Pahlavi and Revolutionary Iran." I benefited greatly from the feedback and encouragement from the panel chair, Soha Bayoumi, my co-panelists, and the audience. Additionally, the feedback provided by anonymous journal reviewers, Indrani Chatterjee, Stephen Nix, David Rahimi, and Babak Tabarraee immensely improved its quality and I am grateful for their comments. I am responsible for any remaining defects. Lastly, this project would not have been possible without the knowledge and generosity of Dale Correa (UT Austin) and the staff at Princeton University's Seeley G. Mudd Manuscript Library.

¹Regarding the title of this article, Afkhami also examines "sanitized modernity" in his book *A Modern Contagion*. For other histories written on public health in modern Iran, see Good, "Health Care in Modern Iranian History"; Schayegh, "Sport, Health, and the Iranian Middle Class"; Sevf, "Iran and

Histories of public health in Iran have reflected this dynamic by predominantly centering on elite or urban narratives, implicitly positioning them as the most legitimate subjects of history. While Iranian court personalities, *hakims*, and European visitors represent important aspects of Iran's public health history, they do not comprise the totality of subjects in the unfolding of modern public health care in Iran.² Rural populations tend to appear in these narratives as national or provincial statistics, without the particularity afforded by localized case studies.³ This paper shifts the focus to Iran's villages and emphasizes the legitimacy of rural inhabitants as historical subjects by examining the twentieth century public health history of northern Khuzestan.⁴ It fuses the stories of technocratic decision-makers and villagers, thereby demonstrating the intertwined nature of and blurred divisions between urban/rural and center/periphery histories. Tehran-based technocrats designed plans for the modernization of Khuzestan through sanitization, which did not always produce the desired results because of the diverse actions of the programs' target populations. Sometimes villagers welcomed initiatives and at other times they responded with ambiguity, but by the 1970s they actively requested particular services.

I argue that Khuzestani villagers generally desired state public health services but their responses to particular initiatives differed according to criteria that had little to do with the source of health services. Villager actions which confounded technocratic plans often did not function in a mode of "resistance" but rather resulted from the continuance of pre-existing modes of living. They actively sought health care capable of treating the myriad diseases afflicting their societies without significant philosophical or theological resistance to novel medical practices or substances. Earlier treatments of Iranian villagers in twentieth century history have often considered their agency via political resistance to or compliance with particular state regimes.⁵ This paper follows the directions taken by scholars like David Rahimi and Arunima Datta in exploring the activities of historical subjects outside of an explicitly political framework and understanding their actions in more immediate personal matrices instead of positioning their activities vis-à-vis the state.⁶

Villagers' historical agency in this story manifests in the actions they take regarding their own health. If rural Khuzestanians ruined a newly cleaned drainage ditch in their

Cholera"; Ebrahimnejad, *Medicine, Public Health and the Qajar State*; Floor, *Public Health in Qajar Iran*; Azizi and Azizi, "Iranian Medical Students Abroad"; Harris, *A Social Revolution*.

²*Hakim* generally indicates a philosopher or Islamo-Galenic physician. Ebrahimnejad, *Medicine, Public Health, and the Qajar State*, 252.

³Scott noted decades ago that peasants tended to appear in histories as either rebellious movements or as "anonymous contributors to statistics on conscription, crop production, taxes, and so forth." *Weapons of the Weak*, xv.

⁴On the establishment of medical infrastructure in early twentieth century southern Khuzestan, see Floor, *History of Medicine in Iran*, 107-29.

⁵See Hooglund, *Land and Revolution*; Kazemi and Abrahamian, "Nonrevolutionary Peasantry"; Kazemi, "Peasant Uprisings"

⁶David Rahimi, "Remembering Revolution." Arunima Datta ('Immorality,' 587) noted that "Indian coolie women often consciously acted upon fleeting opportunities to forward their own interest, not necessarily to challenge or change the societal order."

village by digging mud out of it for home repair, subsequently causing the failure of this ditch to drain properly, are the villagers being “subversive” or are they simply retrieving building material from their usual source? Here the villagers’ agency partially becomes apparent in their disruption of central planning by fulfilling their immediate and practical needs rather than political or ideological concerns. In considering the broader effects and success or failure of development plans, officials either miscalculated the ramifications of their projects or failed to take all factors into account, which should be an uncontroversial claim.⁷

Mid-twentieth century public health planners in Khuzestan gave priority to economic goals over social well-being and accordingly preferred cheaper and simpler public health strategies they could implement more quickly. The tangled web of institutional public health jurisdictions in Khuzestan between 1958 and 1963 compounded the desire for simple, relatively narrow policies that minimized the risk of antagonizing other public health entities. Additionally, vertical decision-making, which largely dismissed any input from villagers, sometimes led to the allocation of resources towards issues deemed important by public health officials but not local residents. The gap between official policies and local desires increased as time passed, culminating in the forced resettlement of villagers to planned labor towns (*shabraks*) in the early 1970s. Although villagers desired health care, state public health programs were often nonexistent, incomplete, or misapplied.

Khuzestan’s rural populations only gained access to health care after development officials decided these villagers might contribute to the national economy. Officials quickly removed nearby areas deemed economically marginal from the development agenda, in particular the Dasht-e Mishan region near Hoveyzeh, after they estimated the costs would outweigh potential returns.⁸ Inspired by the proponents of modernization theory, development and public health officials intended to create productive wage laborers for the national good. Historians of mid-twentieth century rural Iran have not critically examined the effects of the entry of public health initiatives into village life, focusing instead on the land tenure effects of the White Revolution initiatives begun in 1963.⁹ While the history of land tenure certainly deserves careful study, many aspects of the modern history of rural Iran remain underexamined and deserving of attention.

This article first examines health issues of nineteenth and early twentieth century Khuzestan. Public health development on the national level (e.g. establishment of the Sanitary Council, vaccination programs, etc.) and even provincial level (Anglo-Persian Oil Company employee health coverage) did not directly affect the rural communities of northern Khuzestan. Khuzestanians who did encounter traveling Europeans

⁷For case studies of other twentieth century development plans and their unintended social and ecological consequences, see White, *The Organic Machine*, and Carse, *Beyond the Big Ditch*.

⁸“A Rural Development Project for Dasht-i-Mishan,” 1959, DRC Records (885:1); John Oliver to Russell E. McClure, “Rural Development Project for Dasht-i-Mishan,” 25 January 1959, DRC Records (885:1); George M. McClure to Russell E. McClure, “Public Health Survey,” 20 October 1959, DRC Records (884:8).

⁹See Salmanzadeh, *Agricultural Change*; Hooglund, *Land and Revolution*; Najmabadi, *Land Reform*.

or entered employment in the oil industry demonstrated their enthusiasm for modern medicine. The second section discusses the entry of the American consulting firm, Development & Resources Corporation (DRC), into northern Khuzestan, the unified development project it created, and the resulting public health policies. The third section examines how Iranian officials continued aspects of DRC public health policies after assuming formal control of the development project in 1963. In particular, their continuation and escalation of parasitical worm control prioritized speed and cost efficiency over patient safety and comfort. The fourth section discusses the state's attempts to create modern, sanitary citizens. Public health and development officials initially attempted to sanitize villages, but efforts to increase agricultural output led to the demolition of villages and forced relocation of their residents to labor towns (*shahraks*). The state's potential ability to control rural Khuzestan's lives climaxed in the *shahraks*, yet it also failed spectacularly in fulfilling basic health services. The conclusion offers ideas for future research and calls for more historians of modern Iran to explore the relatively unused DRC archives located at Princeton.

Early Public Health Infrastructure in Khuzestan

Epidemics were a constant presence in the lives of Khuzestanians throughout the nineteenth century. At least seven major cholera, plague, and/or typhus outbreaks struck the region between 1821 and 1890, with smaller epidemics occurring regularly between them.¹⁰ According to Kasravi, the spring 1831 plague outbreak left such a cultural imprint that Khuzestanians still told tales about its devastating effects in the 1920s. He believed that half of the population of Shushtar and its surrounding area either died or fled.¹¹ The 1877 plague afflicted roughly 8,000 Shushtaris and killed more than 1,800 people.¹²

Epidemics did not exist in a vacuum. They often preceded or followed agricultural disasters and weakened communities to the point that other diseases later killed survivors of the initial epidemic. After Khuzestan began to recover from the October 1853 cholera outbreak, malaria and typhus spread through the region. Rising grain prices the next year meant the urban poor had a harder time obtaining food and social stresses led to a rise of disorder in Shushtar and Dezful.¹³ Locusts swarmed

¹⁰Latifpur, *Khuzestan*, vol. 1, 249-63; Seyf, "Iran and Cholera," 176. According to Shahnavaaz (*Opening Up*, 118-19): "Up to and even after 1898 ... there was hardly an epidemic-free year. In 1893, due to outbreaks of cholera, small-pox, and remittent fever [a type of malaria], there was a 'considerable mortality' in Muhammareh and upper Karun ... Two years later it was influenza, and in 1901 small-pox. The next year a combination of cholera and small-pox caused distress. During the summer of 1904 the whole region in the south was visited by plague and cholera ... Another epidemic of cholera ... hit Muhammareh and Khuzestan in 1911."

¹¹Kasravi, *Pansad saleh*, 178-80. Austen Layard traveled regularly through Shushtar less than two decades after the epidemic and reported nearly 20,000 casualties of the plague. Layard, *Early Adventures*, vol. 2, 42.

¹²Latifpur, *Khuzestan*, vol. 1, 249-58.

¹³*Ibid.*, 251.

the agricultural area around Dezful in 1865, drought and famine struck in 1866, and cholera spread into Iran from Iraq that same year.¹⁴ In this way, epidemics formed one part of a natural cycle that Khuzestanians had coped with for millennia, as had other societies around the world.

Just as Alan Mikhail noted that traditional Islamic injunctions against fleeing from plague did not stop “all (or any) Muslims” in Egypt from doing so, such proscriptions did not stop residents of Dezful or Shushtar from fleeing epidemics.¹⁵ Abd al-Ghaffar Najm al-Molk, sent by Naser al-Din Shah to report on conditions in Khuzestan in 1881, noted that the urban elites had fled quickly in years of plague and peasants eventually followed.¹⁶ These Khuzestanians settled around the Ottoman towns of Basra, Hillah, and especially Amarah. Dezfulis alone had over 1,000 homes in these new areas.¹⁷ Hossein Qoli Khan, the governor of Khuzestan at the time, noted that *‘ulama* and *sadat* (seyyeds, descendants of the Prophet) also fled from Shushtar after the cholera outbreak of 1890.¹⁸ Although Khuzestani villagers lacked the tools of modern medicine to combat epidemics, their mobility afforded them at least one avenue of agency.

Many more epidemics swept through Iran in the nineteenth century, but it is not always clear to what degree they affected Khuzestan. The Karun was only opened to international traffic by Naser al-Din Shah in 1888 and twenty-five years later “the British were less than satisfied with the ‘development’ of the area.”¹⁹ Most pilgrims, traders, and travelers chose routes circumventing Khuzestan. The popular pilgrimage route from Iran to the holy cities in Iraq lay north of Khuzestan until the greater popular use of railway and bus travel via Andimeshk, Ahvaz, and Basra became prominent in the 1940s.²⁰ Although quarantines were regularly established at Moham-mareh, the governments in Tehran and Istanbul worried more often about Qasr-e Shirin, between Kermanshah and Baghdad.²¹ Bushehr deflected international maritime trade bound for Shiraz to the south of Khuzestan.²² Of course, Khuzestan was not completely insulated and epidemics still visited it. During the cholera epidemic of 1903, the focus on quarantines at Bushehr prompted some merchants to send their goods from Isfahan to Ahvaz via the Lynch road, which ran through the Bakh-tiari Mountains and past Shushtar into the heart of Khuzestan.²³

¹⁴Ibid., 252, 262; Afkhami, “Age of Epidemics,” 50.

¹⁵Mikhail, *Nature and Empire*, 214.

¹⁶Khazeni, *Tribes and Empire*, 68.

¹⁷Najm al-Mulk, *Safarname-ye Khuzestan*, 26.

¹⁸Latifpur, *Khuzestan*, vol. 1, 262.

¹⁹Shahnavaz, *Opening Up*, 35, 45.

²⁰Ibid., 51; Mikiya Koyagi, unpublished manuscript.

²¹Afkhami, “Age of Epidemics,” 93, 328, 439.

²²Ibid., 204. The political battles between Britain and Iran over control of its quarantine regimes occupy a large part of Afkhami’s study. He also provides maps in his appendices for the progression of epidemics into Iran. They indicate paths through the Kurdish region, the ports on the Persian Gulf, and from Central Asia while Khuzestan does not appear as a major disease passage. Ibid., 467, 468, 484, 485.

²³Shahnavaz, *Opening Up*, 114.

In fact, European visitors increasingly traveled through Khuzestan during the nineteenth century. Many of them carried medicines previously unknown to Iranian villagers and they related in their writings that Khuzestanians were often (though not always) eager to try new cures for whatever disease ailed them. Arriving at Tol-e Qal'eh (near Izeh) in the 1840s, Austen Layard wrote that, "my reputation as a Frank physician had preceded me, and I had scarcely arrived at the castle when I was surrounded by men and women asking for medicines ... [Mohammad Taqi Khan]'s principal wife sent to ask me to see her son."²⁴ Layard says that he gave the khan's wife quinine. Two Persian physicians also attending the boy initially convinced her not to use the medicine, but after the boy's condition worsened and a Qur'an reading gave a favorable omen, Layard was allowed to administer "Dover's powder" and quinine.²⁵ In May 1890, Isabella Bird Bishop noted:

Sick people come at intervals all day long, and the medicine chest is in hourly requisition ... The fame of the "tabloids" has been widely spread, and if I take common powders out of papers, or liquids out of bottles, the people shake their heads and say they do not want those, but "the fine medicines."²⁶

According to Durand, writing near the beginning of the twentieth century, "the [Bakhtiari] villagers everywhere used to come to us for medicine, especially for quinine ... They suffer much from fever, and prize quinine very much."²⁷ Bakhtiari tribe members were not the only rural Iranians to seek out new and unusual medicinal treatments. Villagers all over Iran sought new medicines from the foreigners that began arriving to their country in ever-increasing numbers.²⁸ Clearly, the serious and immediate need for treatment of the many diseases faced by rural Iranians outweighed any potential misgivings in their minds about receiving non-Islamic medicine from non-Muslims.

During the reign of Reza Shah (1925-41), both state policies and media discourses usually prioritized urban public health. The state's public health policies promoting exercise and sport among the middle and upper classes stemmed from its prioritization of nationalist productivity and concern about the physical degradation of a growing bureaucratic class.²⁹ This particular interest in the well-being of Iranians did not extend to the lower classes. On the contrary, the urban poor needed to be controlled and sanitized so they could be prevented "from wrecking the whole nation-building project and infecting it with their latent pathologies."³⁰ Firoozeh Kashani-Sabet has

²⁴Layard, *Early Adventures*, vol. 1, 147.

²⁵The khan's son recovered. *Ibid.*, 151-2.

²⁶Bishop, *Journeys in Persia and Kurdistan*, 336-7.

²⁷Durand, *Autumn Tour*, 125.

²⁸See Floor, *Public Health in Qajar Iran*.

²⁹Schayegh, "Sport, Health, and the Iranian Middle Class," 342-342. Kashani-Sabet (*Conceiving Citizens*, 137) also discusses the role of sport and exercise in early Pahlavi-era concerns for women's health.

³⁰Schayegh, "Sport, Health, and the Iranian Middle Class," 348-9.

written about the increasing attention paid to maternal health in this period, noting that maternalists generally sought to “circumscribe the spread of venereal disease and to endorse population growth and preservation.”³¹ Although some activists like Rawshanak Naw’dust included rural women in their analysis of the conditions of Iran’s women, few rural-focused programs appear to have emerged from early maternalist discourses.³² Measures like the 1932 law requiring parents to vaccinate their children or a 1936 government memorandum urging village sanitization indicate some state aspirations to extend modern health practices into the countryside, but the impact of such legislation on actual rural health practices remains unclear.³³ Later reports indicated no government health services existed in northern Khuzestan except spraying by mosquito trucks around 1957. Many of Iran’s villagers relied on their own resources for health care until well after Reza Shah’s departure.³⁴

The Anglo-Persian Oil Company (APOC) entrenched itself in Khuzestan in the first decade of the twentieth century and introduced a novel system of public health to the region. This new provincial power broker’s approach to health care stemmed primarily from its acute need for labor. While APOC needed British and Indian employees for engineering and administrative purposes, it needed Iranians for “road-making; for handling and transporting, by mule and ass, the machinery ... used in constructional work; and for assistance in the elementary operations of rig building and drilling.”³⁵ APOC officials instituted employee health services both to keep labor functioning and to retain it for stable employment. J. W. Williamson surveyed the APOC operations in the mid-1920s and wrote:

It was not sufficient to attract the tribesmen to service with the Company by the prospect of regular pay and the additional comforts that pay could bring ... Gradually they came in increasing numbers into employment and problems immediately arose as to their health, their housing and training ... From the outset it was recognized that proper provision for dealing with sickness was at least as important as attractive pay.³⁶

The belief of APOC employees in the necessity of employer-provided health care to prevent high employee turnover rates speaks to the desire of Khuzestani laborers for better health care than they might have obtained in their own communities. Just as rural Khuzestanis had sought out foreign medicine in the nineteenth century, so

³¹Kashani-Sabet, *Conceiving Citizens*, 66. The encouragement of large families ceased after the mid-1960s and family planning became the priority. *Ibid.*, 192.

³²*Ibid.*, 82-3, 111, 134-5.

³³*Ibid.*, 112-13.

³⁴Cronin, “Fall of Sardar Asad,” 211. At the same time, not all rural spaces endured equal neglect. Northern regions seem to have received more attention than southern regions. Naw’dust herself concentrated on rural women of Gilan. “While Azerbaijan had several foreign schools for girls, Khuzistan was reported as having none.” Kashani-Sabet, *Conceiving Citizens*, 135.

³⁵Williamson, *Persian Oil Field*, 145.

³⁶*Ibid.*, 121-2.

too were their descendants in the 1920s more than happy to engage with new modes of health care.

Williamson's comment about the importance of employees' health, housing, and training reflected a belief in the connectivity of these three factors that would also manifest in future Khuzestan sanitation projects. Through housing and other infrastructural measures in company towns, APOC health officials prioritized the maintenance of sanitized and delineated social spaces.³⁷ In APOC's Khuzestan company towns, laborers left behind their villages and black tents to live in "rows on rows of sanitary well built [sic] houses."³⁸ The orderliness APOC attempted to impose on the living spaces of its inhabitants by keeping animals out of yards and building sewage systems was not just for cleanliness and disease prevention. It also functioned to "intervene directly in the domestic space of the family and to modernize it."³⁹ The company's labor housing performed the dual function of providing a sanitary environment and transforming the individual's conception of what constituted a correct domestic space. These functions of housing dovetailed with the company's vision of the role of education in health care. Education and public health were bound together in the eyes of twentieth century European and American public health officials.⁴⁰ By 1927, the oil company operated two elementary schools at Masjed Soleyman, a primary school and secondary school at Ahvaz, and an elementary school at Abadan. Only the sons of industry employees could attend and APOC officials intended these schools to produce future employees.⁴¹ The strictly controlled notions of public health manifested in labor housing were reinforced at these schools. Williamson noted with satisfaction that the "sanitary arrangements and the equipment of both the primary and the secondary school [in Ahvaz] are good. There is a daily medical inspection and a keen watch is kept on the health of the pupils."⁴² Reminiscent of American health education policies in Filipino schools in this same period, APOC school officials sought to create new Iranians by impressing the importance of hygiene and sanitation in the minds of their young students.⁴³

Although these APOC attempts to transform Khuzestani notions of disease and hygiene were pervasive in their company towns, their scope applied "only to the areas of the Company's operations. Elsewhere the public health department of the Persian Government [safeguarded] the health of the Persian communities."⁴⁴ Most of APOC's activities were at higher elevations along the Zagros foothills, away

³⁷For a similar phenomenon in Ottoman Egypt, see Mikhail, *Nature and Empire*, 230-41. For the Philippines, see Anderson, *Colonial Pathologies*. On "sanitary segregation" in Central America, see Sutter, "Nature's Agents or Agents of Nature," 733-5.

³⁸Williamson, *Persian Oil Field*, 141.

³⁹Ehsani, "Khuzestan's Company Towns," 386.

⁴⁰Anderson, *Colonial Pathologies*, 116-17.

⁴¹Williamson, *Persian Oil Field*, 150-1.

⁴²*Ibid.*, 153.

⁴³Anderson, *Colonial Pathologies*, 202.

⁴⁴Williamson, *Persian Oil Field*, 133.

from Khuzestan's primary agricultural zones.⁴⁵ In reality, the operations of Iran's Ministry of Health barely existed outside of Khuzestan's largest cities and much of the rural population continued to live without modern medical services into the mid-1950s.⁴⁶

The DRC and Expansion of Public Health Infrastructure to the Northern Khuzestan Plains

The first efforts to establish a modern development project in Khuzestan appeared in 1876, as Naser al-Din Shah's French doctor nearly won a concession for his home country to construct a dam and canal system near Ahvaz.⁴⁷ Several more studies were conducted and half-attempts were made over the following decades to develop the province, with no results until the Plan Organization of Iran, led by Abolhassan Ebtehaj, signed an agreement with an American consulting firm, Development & Resources Corporation, in 1956.⁴⁸ The founders of the DRC, David Lilienthal and Gordon Clapp, were former chairmen of the Tennessee Valley Authority (TVA) and intended to import that model from the United States to Iran.

The Tennessee Valley Authority represented a "unified development project." Developers did not believe economically marginal regions could be transformed into economically productive and socially stable success stories with just one or two discrete projects. According to this model, isolated educational programs or modern dams would fail to alter fundamental economic structures. Instead, multiple integrated projects had to begin contemporaneously in order to maximally transform societies. Dams, electrical grids, energy utility companies, and agricultural co-operatives all had to be created at the same time farmers were urged to integrate herbicides, pesticides, new livestock breeds, and new machinery into their agricultural practices. While economic concerns may have dominated development discussions, such "multi-purpose programs had to promote social change." A new economic order demanded a new kind of individual with new trade skills and a "modern, progressive outlook."⁴⁹ This modern outlook included new conceptions of health.⁵⁰

⁴⁵Ehsani ("Khuzestan's Company Towns," 362) lists the primary APOC towns in Khuzestan as Abadan, Masjed Soleyman, Omidiyeh, Aghajari, Haftkel, Naft-e Sefid, Gachsaran, and Lali.

⁴⁶Carl E. Taylor, "Report and Recommendations on a Health Program for the Khuzestan Region," 1959, DRC Records (885:8), 14.

⁴⁷Curzon, *Persian Question*, vol. 2, 333.

⁴⁸It should be noted that two groups of Iranian businessmen actually initiated their own private projects to build smaller modern dams and irrigation systems on tens of thousands of hectares of land in Khuzestan in the late 1940s. These entrepreneurs were eventually forced to give up their lease or sell their land to the government for the DRC-controlled project. One group was the first to import a tractor into Khuzestan in 1947. Salmanzadeh, *Agricultural Change*, 191-2. Ebtehaj had been considering plans for developing Khuzestan by 1945, when he was governor of *Bank-e Melli* (National Bank). Ebtehaj, *Khaterat*, 373.

⁴⁹Ekbladh, *Great American Mission*, 52, 71.

⁵⁰*Ibid.*, 90.; On the transformation of health along the Nile after the construction of the Aswan Dam in 1902, see Derr, *The Lived Nile*.

The Tennessee Valley Authority model (with Lilienthal as one of its most enthusiastic supporters) was renowned globally and Iranian development planners were aware of it before signing the contract with Development & Resources Corporation in 1956.⁵¹ Several Liberal intellectuals saw the TVA as a powerful example of expert central planning the United States could share with Third World countries to counter Soviet development overtures.⁵² Jawaharlal Nehru invited Lilienthal to India in 1951 so that he might apply his resource management experience to conflict resolution. He also traveled to Pakistan to meet Prime Minister Liaquat Ali Khan and to West Bengal where he met “young Indian engineers who had trained at the TVA.”⁵³ Lilienthal and Clapp founded the Development & Resources Corporation in 1955 and infused it with the spirit of the TVA. Soon, the lofty aspirations of the TVA circulated through company projects and consultations in Colombia, Puerto Rico, and South Vietnam.⁵⁴ Mohammad Reza Shah allegedly learned of the TVA during a 1954-55 visit to the United States and became intrigued by the idea of a similar project in Khuzestan.⁵⁵ This is the model that Lilienthal and Clapp brought to northern Khuzestan, manifesting in the Dez Irrigation Project (DIP).⁵⁶ Lilienthal, Ebtehaj, and their partners intended to eventually expand the unified development model to other regions of Iran.⁵⁷

Lilienthal came away from his first meeting with Plan Organization officials with the understanding that the Iranians expected Development & Resources Corporation “to take full responsibility” for the surveying, designing, and execution of the development project.⁵⁸ On 27 November 1956, DRC presented the Plan Organization with a contract which proposed “an American private corporation have delegated to it a large part of the executive responsibility for development” of Khuzestan.⁵⁹ The next day, Lilienthal, Clapp, and other DRC employees had meetings about a sugar cane plantation (the future Haft Tappeh site), a steel plant, and then met with about sixty members of the Plan Organization. After that, they “circulated around among the various people, including the High Council,” whereupon the

⁵¹Ebtehaj (*Khaterat*, 382) wrote that he was already aware of Lilienthal before meeting him because he was once the chairman of the TVA (1941-46) and chairman of the United States Atomic Energy Commission (1946-50).

⁵²Ekbladh, *Great American Mission*, 47-8. Lilienthal regularly voiced anxiety about Soviet activities in his journals and viewed the Khuzestan project as an opportunity to counter Soviet influence in Iran. Lilienthal, *Road to Change*, 97.

⁵³Haines, *Rivers Divided*, 109-10.

⁵⁴Ekbladh (*Great American Mission*, 159) noted that DRC drew much of its staff from the TVA headquarters in Knoxville, Tennessee.

⁵⁵Salmanzadeh, *Agricultural Change*, 191-2.

⁵⁶According to Gilman (*Mandarins of the Future*, 38, 226), “the TVA became a prototype for how the state could act as a rational, benevolent enforcer of the national interest,” and David Lilienthal was a recognized member of the school of modernization theory. For the TVA’s influence on the Aswan High Dam project in Egypt, see Mitchell, *Rule of Experts*, 44-5.

⁵⁷Lilienthal, *Road to Change*, 80.

⁵⁸*Ibid.*, 81.

⁵⁹*Ibid.*, 128.

High Council Chairman told them their draft contract had been approved with the caveat that they wished DRC to take on even more responsibility.⁶⁰ Lilienthal, Clapp, and Ebtehaj, representing the DRC and Plan Organization, signed the contract on 1 December 1956.⁶¹

The United States Senate Committee on Foreign Relations invited Lilienthal and Clapp to a committee session in 1962 in order to discuss its activities around the world with particular emphasis on its involvement in Iran.⁶² The two reported that, at the time, they “[had] an organization with headquarters in Ahvaz ... simply an administrative arm of our company ... [employing] about 100 oversea [sic] people, both American and European, and about 1,200 Iranians.”⁶³ This “administrative arm” was the Khuzestan Development Service (*Mó’asseseh-ye ‘Omran-e Khuzestan*). They described the Khuzestan Development Service as an organization which directed and supervised work “on behalf of the Plan Organization of the Government of Iran.”⁶⁴ According to Lilienthal:

Plan Organization must review and approve specific projects before our company may begin any project such as a water control dam or a sugarcane development. After that approval, however, it is up to us ... to get the job done, through our own employees or through organizations with whom we contract and whom we supervise ... The chief reason advanced by Iran for proposing and continuing this unusual arrangement was Iran’s strong sense of urgency, of time urgency [sic] that things needed to be done as promptly as possible.⁶⁵

In 1963, per contractual terms, DRC turned formal control of organizations and activities over to Iranian hands. Since the beginning of discussions between the Plan Organization and DRC, each side had agreed on the necessity of training Iranians to eventually take over operations from the foreigners who initially filled the managerial and skilled technical positions. The Iranian Majles created the Khuzestan Water & Power Authority (KWPA; *Sazman-e Ab va Bargh-e Khuzestan*) in 1960,⁶⁶ and it assumed full responsibility for the maintenance of Dez Dam and

⁶⁰Ibid., 130. Lilienthal (Anon. *Activities*, 8) later stated: “This is an unusual kind and quality of responsibility ... the breadth of the responsibility delegated by a sovereign nation to a private American company, a company having no official links nor financial dependence upon the U.S. Government, nor upon the United Nations. But neither we nor the contractors we employ acquire any ‘concession’ or proprietary or financial interest in the resources developed; compensation in all cases is limited to payment for the managerial or technical services rendered.”

⁶¹Lilienthal, *Road to Change*, 131.

⁶²According to the invitation from the Chairman, J. W. Fulbright, the committee had “been interested in the operations of private American enterprises in countries receiving assistance from the United States.” Anon. *Activities*, 3.

⁶³Ibid., 4.

⁶⁴Ibid., 4.

⁶⁵Ibid., 8.

⁶⁶Ibid., 10.

Khuzestan's other utility infrastructure in 1963. DRC employees remained in Iran primarily as advisors and consultants until they all left the country during the 1979 revolution.⁶⁷

The Development & Resources Corporation intended the Dez Irrigation Project to comprise around 125,000 hectares of cropland under controlled irrigation from the Dez Dam (completed in 1963). In 1957, Iran was not capable of funding such a project on its own, so Plan Organization and DRC officials negotiated with the World Bank for a loan. The World Bank preferred smaller scale projects, so the Plan Organization presented a plan for a 20,000-hectare Dez Pilot Irrigation Project on the east bank of the Dez River to test the feasibility of the larger project, which the World Bank agreed to finance in May 1960. The larger project was approved at later stages. Stage I (agreed to in 1969) added 54,000 hectares to the project and Stage II added another 29,000 hectares by 1975, bringing the total to approximately 103,000 net hectares of controlled irrigation.⁶⁸

In the late 1950s, the Ministry of Health had a regional office in Ahvaz, but very few people in the field. Deputy Minister of Health, Dr. Jamshid Amouzegar, claimed the ministry's limited budget did not permit it to expand activities in Khuzestan and made it difficult to offer salaries for recruiting doctors from other areas of Iran.⁶⁹ Only one Health Educator existed for the entire province, and the ministry's lack of Arab or Arabic-speaking employees prevented it from effectively engaging with a significant segment of the population.⁷⁰ By the time the Development & Resources Corporation arrived, the primary public health action taken by the Ministry of Health in rural Khuzestan was the deployment of mosquito spray trucks. In 1953, 882 villages (est. population 317,000) were sprayed with DDT and the spray program expanded to 2,702 villages (est. population 483,000) by 1956.⁷¹

Several governmental and non-governmental organizations provided some sort of health care in Khuzestan by 1958: the Ministry of Health, the National Iranian Oil Company, the Red Lion and Sun Society, Queen Soraya's Charity, the Iranian State Railways, the Imperial Foundation, the Iranian Army, and the Workers Social Insurance Organization. Between these organizations, Abadan, Masjed Soleyman, Dezful, and Andimeshk each had a single hospital while Ahvaz had three hospitals. A few "health centers," dispensaries, and clinics also existed in the larger urban

⁶⁷For detailed discussion of the organization of and relationship between Iranian and DRC entities, how DRC selected contractors for Iranian projects, World Bank Iranian loan details, and other information, see *ibid.* According to Shahmirzadi ("Sazman va Modiri'at," 12), the Iranians who worked for KWPA came to be considered some of the most knowledgeable development experts in the country and officials in other provinces sought to hire them for their own projects.

⁶⁸Salmanzadeh, *Agricultural Change*, 38-9.

⁶⁹"KDS Role in Public Health Activities in Khuzestan. Present: G. R. Clapp, Dr. J. Amouzegar, J. J. Goulden, T. A. Mead, 16 February 1958," DRC Records (885:1).

⁷⁰T. A. Mead, "Medical and Health Problems in Khuzestan," 1958, DRC Records (885:6), 10.

⁷¹Jamshid Amouzegar, "A Report on Public Health Problems of Khuzestan (Ostan 6)," 1957, DRC Records (886:2), 10.

areas. Ahvaz might have had as many as seventy private practitioners while Dezful had only a few. Although Williamson wrote in 1927 that APOC hospitals often provided medical services to locals unaffiliated with the company, in 1958 the National Iranian Oil Company (NIOC) and Railways Administration institutions only offered services to their own employees.⁷² In a 1956 survey for the Development & Resources Corporation, P. A. Satralker rejected hospitals at Dezful and Shushtar as unsuitable for DRC use. The closest acceptable hospital for the companies' operations in the upper Khuzestan plains was located at Ahvaz.⁷³

Whatever services those organizations offered, villagers in the rural areas around Shushtar, Dezful, and Susangerd enjoyed few of them. Typhoid, dysentery, trachoma, intestinal parasites, typhus, schistosomiasis, endemic syphilis, and leishmaniasis are just some of the diseases rural populations of the upper Khuzestan plains continued to encounter without institutional support until the commencement of the Khuzestan development project.⁷⁴ APOC was seriously concerned with the threat of malaria to its labor force by the 1920s but struggled to contain the disease and was not primarily concerned with the agricultural areas of upper Khuzestan.⁷⁵ The agriculturalists of the upper plains only came under consideration for extended public health services once the Pahlavi state considered them to be economic assets. The state's perception of an individual's ability to contribute to the national economy determined their access to health care.

DRC executives hired Dr. F. G. L. Gremliza as their top public health official and he determined that malaria no longer constituted a serious threat to Khuzestanians.⁷⁶ In an early survey conducted between December 1958 and June 1959, he recorded thirty-six cases of malaria among 10,660 people (25 villages) in the Dez Irrigation Project.⁷⁷ A malaria survey conducted in 1960 and 1961 found only fifteen cases. He considered the anti-malarial campaign of the Ministry of Health well-developed enough to refrain from an extensive program of treatment and instead remain vigilant for new cases,

⁷²Williamson, *Persian Oil Field*, 124; Mead, "Health Problems," 2. Dr. Mead notes on this page that the three hospitals at Ahvaz were operated by the Ministry of Health, the Railways Administration, and the Red Lion and Sun Society. Williamson described an impressive APOC hospital at Ahvaz in 1927, and it is unclear what happened to that institution. It is possible APOC/NIOC eventually considered it redundant as other hospitals opened in the city and consolidated operations at Abadan and Masjed Soleyman.

⁷³P. A. Satralker, "Diseases and other Health Hazards in Khuzestan Region—Iran," 1957, DRC Records (885:2), Appendix: "Map of Khozistan No. 2."

⁷⁴Satralker, "Health Hazards."

⁷⁵Afkhami, "Age of Epidemics," 397.

⁷⁶The German doctor was not a new arrival to Khuzestan. He had spent the eight previous years working around Susangerd prior to joining the DRC and spoke Arabic. At least part of this time was spent working for the Imperial Foundation. J. C. Miller to Mr. Jandry, "Dr. Gremliza—Schistosomiasis," 18 April 1958, DRC Records (885:1).

⁷⁷F. G. L. Gremliza, "Operation of a Mobile Medical Field Unit and Public Health Survey in Dez Irrigation Project Area for the Period September 1959 through June 1960," 1960, DRC Records (885:7), 49.

although the last malaria epidemic had just occurred in 1957.⁷⁸ Some public health officials felt they had the disease comfortably under control while others warned of the possibility of future outbreaks. Carl Taylor warned in 1959 that, although previous incidence rates of 80-90 percent had fallen to 4-5 percent, there were signs that mosquitos were developing resistance to DDT. Additionally, Taylor feared Zagros nomads inhabiting the outskirts of the Dez Irrigation Project area risked reintroducing the disease because they were still too mobile in the mountainous terrain for spraying strategies to have any effect.⁷⁹ His warnings proved prescient as outbreaks in the fall seasons of 1963, 1964, and 1965 led to 3,146 total cases appearing among a population of roughly 13,500 people. In the late 1950s, however, DRC's medical officers de-emphasized malaria and instead identified schistosomiasis as their top priority.⁸⁰

Schistosomiasis is a disease caused by parasitic worms and the type found in Khuzestan, *Schistosoma haematobium*, affects the urinary system. Symptoms can include inflammation, ulcers, fibrosis (thickening and scarring of connective tissue), calcification (a build-up of calcium), bacterial infections, and bladder stones, but the most common symptom is hematuria (blood in the urine). Although schistosomiasis is usually not fatal and populations in endemic areas develop a limited resistance to the disease, development officials viewed it as detrimental to labor productivity.⁸¹ Health officials would need to eradicate *S. haematobium* to maximize agricultural output.⁸² Gremliza, considered one of the more sympathetic DRC officials to the local population, wrote:

The planning of irrigation projects in the Khuzestan necessarily considers the general health of the population, its hygiene and medical care, because the cultivators in these areas will be required to undertake a workload which will be greater than that previously required of them.⁸³

⁷⁸F. G. L. Gremliza, "Report on the Operations of a Mobile Medical Field Unit and on a Public Health Survey in the Deshteh-Mishan Area of the Khuzestan Region: December, 1958, to June, 1959," 1959, DRC Records (886:3), 30.

⁷⁹Taylor, "Report and Recommendations," 6.

⁸⁰Schistosomiasis is sometimes referred to as "bilharzia" or "bilharziasis." For an account of a similar campaign against hookworm in the United States, see Ettling, *Germ of Laziness*. DRC officials consulted some acquaintances from the Rockefeller Foundation on public health policy in Khuzestan and courted the organization for funding without success. For examples, see J. Clayton Miller to Jandrey, Oliver, and Clapp, "KDS Health Staff and Organization, 22 July 1958," DRC Records (885:1); J. Clayton Miller to Crosby and Mead, "KDS Director of Health, 15 August 1958," DRC Records (885:1).

⁸¹Similarly, Schayegh (*Who is Knowledgeable is Strong*, 77) noted that "the principal concern was economic" in relation to malaria control in Iran in the first half of the twentieth century.

⁸²Public health officials both in Khuzestan and around the world eventually recognized the futility of completely eradicating a disease and shifted their goals toward its minimization. However, in 2016 researchers reported the elimination of schistosomiasis in Iran. Khademvatan et al., "Urogenital schistosomiasis," 1390-6.

⁸³Gremliza, "Survey in Dez Irrigation Project Area," 1. A more extreme illustration of the internal contradiction between Gremliza's affection for yet low opinion of Khuzestan's villagers arises in the travel account of Carl Taylor: "[Gremliza] seems to have a great deal of energy and dedication to the work; he seems to be deeply interested in the village people and has an almost obsessive feeling that

The life cycle of the worm relies on human contact with water and health policies (e.g. latrine construction, molluscicide application to bodies of water containing the worm's snail hosts) came to reflect the importance of the human-water contact point.⁸⁴ The prioritization of schistosomiasis treatment and the measures deemed necessary to combat it (personal hygiene, water purification, village sanitization, etc.) would soon provide a variety of points for state entry into village life.

The ecology of schistosomiasis and *Bulinus truncatus* (the aquatic snail host of *S. haematobium*) were not yet well understood by 1956 and public health experts from DRC, the World Health Organization, and Iran's Ministry of Health agreed that more research was needed before they could finalize a robust treatment policy.⁸⁵ Through experiences in Latin America, Africa, and East Asia, development specialists and scientists were acutely aware of the possibility that their projects could introduce serious diseases into previously unaffected areas.⁸⁶ Although World Health Organization researchers proposed that the two most heavily infected areas, the riverine Hoveyzeh landscape and irrigated agricultural zones of Dezful, might have contained schistosomiasis for a long time, they believed the disease might also be in the process of spreading.⁸⁷ DRC executives and medical officials agreed on the possibility of increased irrigation providing wider breeding grounds for *B. truncatus* and the need for preventative action.⁸⁸

By the end of 1958, Gremliza convinced the Development & Resources Corporation to establish a Mobile Medical Field Unit (MMFU) for the project area and assumed management of it to visit communities in Hoveyzeh (December 1958–June 1959) and Dez agricultural area (September 1959–June 1960). These mobile clinics were new to Khuzestan, and the first broad extension of public health to its northern rural regions, but similar clinics had begun appearing decades before

they have been neglected; he is appreciated by the village people of the Dasht-i-Mishan area and it is quite apparent that he has spent much time in the villages that we visited ... Now to turn to some of the difficult matters ... he has been training a corps of village lads as assistants for his mass village surveys ... When I commented on this efficiency Gremliza looked pleased and made the comment that he was training them 'like dogs.' The analogy, of course, may have different meaning in Germany." Carl Taylor, "Diary of Trip to Iran: December 5th, 1958," DRC Records (885:1), 4-5.

⁸⁴Gryseels, "Schistosomiasis," 388-9. Gremliza believed in 1959 that schistosomiasis was not present in DIP canals, but Iranian public health professionals determined that not to be true by 1970. Arfaa et al., "Control of Bilharziasis," 912. Anderson dedicates a chapter of *Colonial Pathologies* (104-29) to the role of excrement disposal in colonial public health.

⁸⁵Iran's Institute of Parasitology and Malariology began surveying the area for schistosomiasis nearly ten years before Gremliza began his surveys for the DRC, yet few results are evident. Arfaa, Bijan, and Farahmandian, "Present Status," 358.

⁸⁶For examples in other regions, see Webel, "Infected Landscape" and O'Gorman, "Imagined Ecologies."

⁸⁷J. Gaud and L. J. Olivier, "Report on Bilharziasis in Iran with Special Reference to Khuzistan Development Plans," 1959, DRC Records (886:1), 9.

⁸⁸Gremliza, "Survey in Dez Irrigation Project Area," 51; Amouzegar, "Health Problems," 8; J. J. Goulden to New York Office, Attn: G. R. Clapp, "Bilharziasis Survey—Karkheh Irrigation Project by Dr. Gremliza," 11 December 1957, DRC Records (885:1); John Oliver to J. J. Goulden, "KDS role in Khuzestan: Public Health Activities," 7 January 1958, DRC Records (885:1).

around the globe in various sizes and under various names.⁸⁹ American health officials established a mobile tent hospital in Puerto Rico in March 1904 and treated more than 5,490 people for hookworm over the next year. Directly inspired by the Puerto Rican campaign, anti-hookworm mobile “county dispensaries” traveled around the American South in the 1920s.⁹⁰ When Carl Taylor learned about Gremliza’s MMFU plan, he wrote in his diary:

He has the British Colonial Service idea of the usefulness of mobile medical units ... It is a typical colonial service mechanism for getting a lot done in a short time with minimum administrative fuss but it just doesn’t provide anything for people to build a sound, self-perpetuating health service.⁹¹

American public health officers introduced a colonial structure of public health to rural Khuzestan in the era of broader global decolonization. The primary concern of the Development & Resources Corporation and its Iranian partners centered on building one of Iran’s first hydroelectric dams and its associated irrigation network and electrical grid. Such projects promised more immediate and tangible economic returns than creating a health care system with greater access to general practice clinics and hospitals for rural residents. Although public health officials considered their agenda critical, it assumed a definitively secondary level of importance within the overall development plan. Accordingly, as Taylor indicated, mobile clinics were cheaper, simpler, and faster than establishing a centralized and comprehensive provincial health administration.⁹²

Recognizing that many rural Khuzestanis were too remote to access the clinics and hospitals of the cities, Gremliza envisioned the Mobile Medical Field Unit survey as an efficient means of providing basic health care to as wide a segment of the population as possible.⁹³ The MMFU team of twelve men, including Gremliza, surveyed approximately 20,660 people in the Hoveyze and Dezful agricultural areas over eighteen months.⁹⁴ The schistosomiasis treatments they gave villagers were not simple, one-time injections. Both adults and children received one injection per day for ten

⁸⁹Gremliza (“Survey in Dez Irrigation Project Area,” 1) wrote that “the history of mobile medical field units has been already described and explained in a previous KDS report on the operations of M.M.F.U.,” but it is unclear to which report he referred.

⁹⁰Ettling, *Germ of Laziness*, 125-6, 158-9.

⁹¹Taylor, “Diary of Trip to Iran,” 2.

⁹²The institutional structure of Khuzestan’s public health services posed another challenge to thoughts of centralization. Various organizations existed as “private empires” with both discrete and overlapping activities. They operated in isolation from each other, communicating only with their superiors in Tehran. Taylor, “Diary of Trip to Iran,” 25-7. Taylor met with many of the major national figures of public health (Chamseddine Mofidi, Jamshid Amouzegar, Torab Mehra, etc.). His short diary relays his conversations with each and their impressions of the state of Iran’s public health infrastructure at the time.

⁹³Gremliza, “Survey in Dez Irrigation Project Area,” 1-2.

⁹⁴Gremliza, “Survey in the Deshteh-Mishan Area,” 34; Gremliza, “Survey in Dez Irrigation Project Area,” 4; The MMFU did not survey in July or August of 1959, presumably because of the heat.

days, and villagers sometimes experienced side effects like abdominal pain.⁹⁵ These treatments introduced a system of disease control in Khuzestan that continued into the 1970s.

In addition to determining the ecology of schistosomiasis, the field clinic was to help Development & Resources Corporation and the Iranian state “view” the region they intended to “return” to prosperity via the unified development project.⁹⁶ Accordingly, Gremliza organized project protocols to ensure the highest participation rate possible. He anticipated popular reluctance to engage with teams of surveyors who brought only questionnaires and no tangible benefits.⁹⁷ He recruited MMFU team members from the operating areas and visited village sheikhs ahead of the team’s arrival, explaining that “the improvement of conditions within the village must depend upon the accumulation of reliable information about it and its problems.”⁹⁸ He wrote that his protocol departed from “established practice” and offered treatment for a variety of common diseases. With the scope of treatment widened beyond schistosomiasis, “large numbers of the population [offered] themselves voluntarily for examination.”⁹⁹ The field clinic surveyed at least 95 percent of the inhabitants of the Hoveyzeh villages it visited on the lower Karkheh river.¹⁰⁰ Just as nineteenth century Bakhtiari petitioned traveling Europeans for quinine, and oil industry health care increased Bakhtiari labor retention in the 1920s, here again the desire of rural Khuzestanis for medical care, regardless of its provenance, becomes clear. Gremliza recognized this desire and used it to further his own agenda. That the villagers deemed his blood tests, urine tests, nausea-inducing pills, and other demands worth submitting to speaks to the level of their desire for medical treatment. According to Gremliza, the village headmen contributed to the high participation rates by explaining the purpose of the mobile clinic to villagers rather than engaging in coercive acts.

Beyond distributing medical care, Gremliza and his team noted perceived deficiencies in villagers’ habits (in addition to other notable aspects of village life). Team members took turns drawing maps of the forty-two surveyed villages in the Hoveyzeh and Dezful areas, each map checked and signed by Gremliza. The maps included housing type, gardens, irrigation canals, and pumping stations. They

⁹⁵Gremliza, “Survey in Dez Irrigation Project Area,” 35.

⁹⁶By “view,” I refer to Scott’s *Seeing like a State*. By “return,” I refer to the countless references by both DRC and Iranian officials to their mission of “returning” Khuzestan to its “ancient glory days,” usually dated to pre-Islamic times. A quote from Lilienthal is representative: “This is the land of Cyrus, Darius, and Shapur the Great. Here many centuries ago, irrigated agriculture ... flourished, but with wars, natural catastrophes, neglect and time, much of the area reverted once more to desert.” Anon. *Activities*, 6. For further reading on the role of idealizations of a pre-Islamic past in Iranian nationalism, see Zia-Ebrahimi, *Race and the Politics of Dislocation*.

⁹⁷Gremliza, “Survey in Dez Irrigation Project Area,” 2.

⁹⁸Gremliza, “Survey in the Deshteh-Mishan Area,” 9, 12-13.

⁹⁹Gremliza, “Survey in Dez Irrigation Project Area,” 2.

¹⁰⁰Gremliza, “Survey in the Deshteh-Mishan Area,” 13. Gremliza blamed the 80-85 percent participation rate average of the six villages in the DIP on the absence of village leaders. His team surveyed twenty-five total villages in the Dezful area.

marked pools of water around the villages where teams found both dead and live *B. truncatus* snails and the locations of homes with cases of schistosomiasis and leprosy. Appendices to Gremliza's reports listed the village's sheikh, population, survey participation rate, principal occupations, domestic animals, crops and dairy products, government facilities, general sanitation, housing type, number of houses, water supply, pumping stations, standard of living, number of bathhouses, number of latrines, manner of excreta and household refuse disposal, presence of health officers, infant mortality, schools, and literacy. The Dezful surveys included those categories and added more, such as the number of mosques, shops, road conditions, electricity supply, and the common birds of the area. The surveys listed individual disease incidence and prevalence rates, differentiating between age and gender.

In a few years, Iranian health agents would set out to alter the aspects of village life identified in these reports which officials viewed as conducive to schistosomiasis infection and prohibitive to modern agriculture. Primitive-seeming irrigation canals were "maze-like, and useless."¹⁰¹ Stagnant pools of water occurred when villagers extracted mud from the ground near their homes to repair walls. Most stock animals stayed in villagers' homes overnight because there was nowhere else to keep them. Of the thirty-two villages in the appendices of Gremliza's surveys, he described the primary waste disposal of thirty-one villages as "indiscriminate and on the surface in alleys, open spaces, and gardens." Only two villages had latrines and the water supply of all but three villages was untreated.¹⁰² In the absence of a latrine system, rural Khuzestanians deposited their waste next to whatever bodies of water lay near the village and facilitated the completion of *S. haematobium*'s life cycle.¹⁰³ Each of these practices had to be replaced with rational and sanitary behaviors in order for Khuzestan to maximize its contribution to the national economy.

Despite Iranian and American public health officials' deep interest in schistosomiasis and village sanitation, villagers of the upper Khuzestan plains did not consider themselves to be living in an exceptionally dangerous location. They evinced no great desire to transform their environment and eliminate disease despite their eagerness for medical care. Gaud and Olivier reported that "in spite of the apparent high prevalence, the people do not complain of the infection, though they recognize haematuria as abnormal."¹⁰⁴ Mead added:

¹⁰¹F. G. L. Gremliza, "Selected Ecological Facts on Health in the Dez Pilot Irrigation Area," 1966, DRC Records (886:5), 86.

¹⁰²Gremliza, "Survey in the Deshteh-Mishan Area," appendix; Gremliza, "Survey in Dez Irrigation Project Area," appendix.

¹⁰³Satralkar, "Health Hazards, 21; Gremliza, "Survey in Dez Irrigation Project Area," 54. Amouzegar wrote in 1957: "Abadan is the only city in Khuzestan which could be said to have a piped water supply, but even at that incomplete. A municipal supply is now being installed for Khorramshahr. Plans are already underway by the Plan Organization for Ram-Hormoz, Dezful, Andimeshk, Khoram-Abad, and Behbahan." Amouzegar, "Health Problems," 5.

¹⁰⁴Gaud and Olivier, "Report on Bilharziasis in Iran with Special Reference to Khuzistan Development Plans," 8.

The question is put, village by village, “Are there any sicknesses here?” and the answer is always, “No.” What they mean is not, of course, that they are in perfect health, but that there is no major epidemic at the moment ... there is a heavy incidence of disease of all kinds.¹⁰⁵

Gremliza noted in his conclusion of the Dezful survey that, “the attitude of the people of the surveyed zones was, nevertheless, passive rather than active, and they accepted what was done without expressing any wish to participate.” This statement came just after Gremliza wrote that his team “enjoyed the full cooperation and good will” of the villagers, adding that participation would have been much lower if his team had not offered treatment for diseases beyond schistosomiasis.¹⁰⁶ How can we make sense of these seemingly conflicting behaviors?

Until the late 1950s, disease was one of many natural occurrences experienced by the people of the upper Khuzestan plains. No institutions existed that might spread modern conceptions of bacterial disease throughout the villages, despite some familiarity in provincial cities like Dezful and Shushtar with recent scientific discoveries. This does not mean that villagers passively accepted illness. Rather than reading the statements of development officials as evidence of the Iranian villagers’ fatalism, we can read them as indicating different local conceptions of health and illness which necessitated different treatments. Villagers had a variety of responses to disease, but no one expected to eliminate it from existence or even control it on a broad scale.¹⁰⁷ Disease was an intrinsic function of one’s environment and you could no more eliminate disease than you might control spring floods or swarms of locusts.¹⁰⁸ Once a disease became apparent, however, villagers would use whatever resource at their disposal to treat it. In the past, a solution might involve leaving that particular environment and fleeing to Ottoman lands if the disease were dreadful enough. As increasing numbers of foreigners arrived with ever-expanding varieties of medicinal cures, Khuzestan’s villagers willingly incorporated new modes of health care.

Consolidation of Public Health in Iranian Hands

State entry into the communities and bodies of northern Khuzestan increased over the course of the 1960s in the name of public health. Beginning with Gremliza’s surveys, modern health services entered into the villages of the region. Whereas some Khuzestanians had previously sought out modern medicine, now public health officials regularly came to their communities and expected to interact with as many villagers as possible,

¹⁰⁵Mead, “Health Problems,” 11.

¹⁰⁶Gremliza, “Survey in Dez Irrigation Project Area,” 51.

¹⁰⁷Communities around Iran had a variety of responses to parasitic worms. Around Isfahan, people would eat thyme or the seeds of bitter apple (*Citrullus colocynthis*; Persian: *hanzal* or *bendevane-ye abujahl*). Janeballahi, *Pezeshki-ye Sonmati*, 88.

¹⁰⁸On similar epistemologies in nineteenth century Egypt, see Mikhail, *Nature and Empire*, 202-13. In the American context, see Valencius, *The Health of the Country* and Nash, *Inescapable Ecologies*.

regardless of particular individuals' desires or reservations. A KWPA Mobile Medical Field Unit established in the village of Shamoun in 1963 maintained state supervision by continuing the types of surveys of endemic diseases initiated by Gremliza and collecting blood and urine samples.¹⁰⁹ By April 1964, three more MMFUs had been established in the villages of "Najafabad, Ghaleh Nov Askar, and Balenjoon [sic]". Two more public bathhouses were built in "Najafabad and "Ghaleh Robe Bandedal [sic]" and the health officials kept track of the villagers' bathhouse visits.¹¹⁰ Filling in pools of stagnant water, urine sampling, and the other activities instituted at Shamoun spread to these other villages.¹¹¹ Official reports to the International Bank for Rehabilitation and Development estimated that health agents headquartered in the three bathhouses were dispensing 3,000-4,000 "medical treatments" per month.¹¹² The field clinics traveled from their bases in these villages to visit surrounding areas, examining over 31,000 villagers for epidemic diseases in the Dez Irrigation Project by 1967.¹¹³

The permanent presence of multiple field clinics searching for schistosomiasis and other contagious diseases in the DIP allowed health agents to enter villagers' lives on a regular basis.¹¹⁴ By 1970, villagers no longer had to endure ten days of injections for schistosomiasis treatment as in Gremliza's surveys, but the treatment was still unpleasant. At that point, villagers took Ambilhar tablets for four days under agent supervision, once in the morning and once in the evening, and the agents examined villagers' mouths afterwards to ensure they ingested the medication. The side effects of this mass chemotherapy treatment were more severe than those reported by Gremliza, including abdominal pains, nausea, vomiting, muscle pain, and insomnia. Health agents revisited the examined villagers three months, six months, and one year after the initial chemotherapy to collect urine samples and check for successful treatment. 7,317 DIP villagers underwent this treatment in 1967 and 1968, and 88.8 percent completed the entire four-day process.¹¹⁵

¹⁰⁹KWPA, Quarterly Report 10 on Dez Multipurpose Project for Loan 247 IRN, 31 January 1963, DRC Records (527:4); On 14 March 1963, an inspection of Shamoun by Mohammad Reza Shah represented yet another, more symbolic manner of state supervision. KWPA, Quarterly Report 11 on Dez Multipurpose Project for Loan 247 IRN, 30 April 1963, DRC Records (527:4).

¹¹⁰KWPA, Quarterly Report 15 on Dez Multipurpose Project for Loan 247 IRN, 30 April 1964, DRC Records (527:6).

¹¹¹KWPA, Quarterly Report 15.

¹¹²The report does not define these medical treatments. KWPA, Quarterly Report 14 on Dez Multipurpose Project for Loan 247 IRN, 31 January 1964, DRC Records (527:5).

¹¹³Out of a total estimated DIP population of 115,430. In the rest of Khuzestan, 18,297 individuals were examined in areas deemed foci of schistosomiasis by Iranian public health officials. Research was supported by the Institute of Public Health Research at Tehran University's School of Medicine and was funded by the Ministry of Health, the Near East Foundation, and the Plan Organization. Arfaa, Bijan, and Farahmandian, "Present Status," 361.

¹¹⁴A Bilharziasis Research Station affiliated with the Institute of Public Health Research was operating in Dezful by 1965, probably under the supervision of Dr. Chamseddine Mofidi. Arfaa, Sabbaghian, and Bijan, "*Schistosoma Bovis*," 681.

¹¹⁵Arfaa et al., "Control of Bilharziasis," 913-14.

The side effects of a new mass chemotherapy drug called Hycanthonone that schistosomiasis control teams began using in 1972 were apparently even more severe than Ambilhar's, with "many" villagers experiencing nausea and vomiting so severe that health officials quickly administered chlorpromazine (primarily an antipsychotic drug) to the affected. Although the degree of unpleasant side effects for villagers increased, "the main advantage of Hycanthonone ... [was] the short duration of treatment ... greatly reducing time, man-power, transport and expenses of mass-treatment operations."¹¹⁶ The scope of schistosomiasis treatment and the intensity of the treatment's unpleasant side effects had grown in the years since Gremliza's surveys. Despite this, acts of resistance by villagers to these mass chemotherapy treatments scarcely appear in reports of the project's activities. The closest allusion to resistance are statistics indicating that not all villagers completed the treatment regime. While the severe discomfort of the administered drugs may lead us to assume some villagers willfully chose to discontinue treatment, the actual reasons are unclear. The medical reports do not indicate how health agents obtained completion rates near 90 percent. Identifying more precise protocols of medicine and service distribution requires further research.¹¹⁷

Delineation of the Citizen and the Climax of Central Control

The delineation of the modern Iranian citizen as defined by the state involved both the proper constitution of the individual citizen and the proper organization of the public spaces they inhabited.¹¹⁸ Concern for creating a sanitary, and thus ready for labor, citizen led to hygienic instruction in educational curriculum. Concern for the proper spaces in which these modern citizens would live manifested in monitoring the neatness of villagers' homes and reconstructing villages according to the sanitary standards devised by the Development & Resources Corporation and state public health officials. Grace Goodell argued that the Pahlavi state's obsession with neatness in the Dez irrigation area derived from the "compulsion to impose its own order" rather than concern for the well-being of its citizens.¹¹⁹ Several state tactics certainly seem to prioritize control or order over function with no benefit even toward producing healthy labor for economic enterprises.

In the spring of 1963, Shamoun became the first village to undergo a "health education and sanitation program."¹²⁰ Heavy machinery filled in stagnant pools of water surrounding the village that health agents identified as breeding grounds for mosquitos

¹¹⁶Arfaa et al., "Effect of Hycanthonone," 372.

¹¹⁷KWPA Mobile Medical Units continued to monitor, test, and treat villagers until at least February 1970, at which time they also completed a census of families living in areas soon to come under the management of international agribusinesses. Development & Resources Corporation, "Monthly Progress Report of Field and Project Advisory Services, January 21, 1970 to February 19, 1970, Bahman, 1348," April 1970, DRC Records (558:2).

¹¹⁸These are some of the primary issues addressed by Anderson in *Colonial Pathologies*.

¹¹⁹Goodell, *Elementary Structures of Political Life*, 157.

¹²⁰KWPA, Quarterly Report 10; Gremliza, "Ecological Facts," 79.

and *B. truncatus* snails and “200 tons of waste was removed from one street” over the course of five weeks. Health agents dispensed toothbrushes, toothpaste, and soap to thirty boys and administered hygiene training in the village school. The project team also built a cattle yard outside the village because of officials’ concern with the widespread practice of farm animals sleeping inside the villagers’ homes. A public bathhouse was constructed with office facilities for Mobile Medical Field Unit staff and agricultural village workers. In this way, the state’s presence was physically established in the structure representing a new order of public health in the village. Officials did not believe villagers could be trusted to implement or maintain the official vision of village sanitation on their own and so agents settled into this central structure to ensure they complied. In the village Goodell observed, orders from the Plan Organization instructed the village agents to enforce the following rules,

Peasants must ... repair their house walls after a storm, must sweep up all the manure, must not leave tools lying around the house, must bring all their animals out for vaccination when *dulat’s* [sic] veterinary contingent appears, must use toilets eight feet deep and three feet wide with cement bases ... must obey all orders of all State officials, must not eat three-day-old bread, and so forth ... Another serious fine for the mother who allows her child to pick up a dead rat by the tail, double the fine for his playing with it, \$4.50 for the second offense.¹²¹

These were the strictures applied in post-land reform peasant-owned villages, where the residents had much more freedom than in the *shabraks*. Many of these rules doubtless went unenforced, but they demonstrate the degree to which the state intended to insert itself into the lives of villagers who had lived relatively independently until the arrival of the DRC and land reform.

Although the Iranian state strove to delineate proper spaces for modern citizenry, it was not all-powerful. Despite the success of some initiatives, health officials remained unsatisfied with the sanitary practices of villagers. The fact that 49 percent of village homes had modern toilets by June 1968 was a testament to sanitation initiatives. However, 57 percent of livestock owners in the Dez Irrigation Project refused or ignored calls to construct stables away from their residences and still kept their animals inside their homes. Additionally, 135 out of 141 families in the DIP still drew their drinking water from the Dez River or the canals it fed. Village health workers tried in vain to keep livestock out of the canals and worried about city waste flowing downstream from Dezful.¹²² After the KWPA built a drainage canal in Najafabad in 1964, villagers soon began digging clay out of it to use for repairing their homes. The drainage canal then failed to function properly and *B. truncatus* snails reappeared in the village.¹²³

¹²¹Goodell, *Elementary Structures of Political Life*, 148.

¹²²Qasemi, *Barrasi*, 38-9.

¹²³Gremliza, “Ecological Facts,” 80.

The state was able to enforce public sanitation measures most effectively in the *shabraks* it built for the entry of industrial agribusinesses into the Dez Irrigation Project.¹²⁴ The exaggerated manifestations of state power in these new towns highlighted the farcical disconnect between the official ideal of a modern society and the needs of rural Khuzestan.

A visitor from Toronto or Tokyo would be shown the clinic and ambulance center with classrooms for popular instruction, modern medicinal labs, five or six consultation rooms equipped with clinical tables, shiny new cabinets, sinks, desks, sterilization and storage facilities, even the doctor's implements in drawers—all having been ready for opening for five years ... these facilities, although equipped and ready, had never been used, despite the fact that the workers had petitioned the Ministry [of Water and Power] repeatedly to make them available and other Ministries—Health, Education, Labor—had offered staff ... An engineer told me that before the *shabrak* had been built, peasants to be moved into it had listed these particular facilities as those they considered the primary needs of their new urban center.¹²⁵

Barred from using the bathhouses they asked for, *shabrak* residents built showers from the public faucets around town.¹²⁶ Although health agents in the villages decried the lack of sanitary toilets, state engineers constructed the *shabrak*'s toilet pits only a few

¹²⁴When the agricultural growth rate during the Third Development Plan only reached 2.5 percent instead of the 4 percent target, state officials determined the fault lay with traditional cultivation organization rather than their own negligence or unrealistic expectations. Officials decided that international industrial agribusinesses were the solution for strong growth and the Ministry of Water and Power allotted 68,000 hectares of the Dez Pilot Irrigation Project for their use. This decision turned out to be a massive failure in both economic and human terms. The land they received was some of the best in Khuzestan, the Agricultural Development Bank of Iran (ADBI) paid half their start-up costs, their imports were allowed in duty-free, and they were given permission to operate for ten years without paying taxes. The Khuzestan Water and Power Authority "invited" landowners (former landlords and peasants who received property under land reform) to resell their property to the government. Residents of the 100 villages located within the agribusiness operations zones were relocated to *shabraks* within the zones. One group of three *shabraks* contained the inhabitants of twenty-five villages, of which twenty-two were bulldozed after the residents were evacuated. Four agribusinesses were operating in the region by 1974, and by 1976 they were massively in debt. The ADBI was forced to take charge of the operations and the entire affair became a scandal. Similar plans around the country were scrapped and new plans had no chance for implementation before the 1979 revolution. For more information, see Salmanzadeh, *Agricultural Change*, 236-43; Khuzestan Water and Power Authority, "Farm Corporations for the Dez Irrigation Project, Part I," 1970, DRC Records (804:3), 8; Najmabadi, *Land Reform*, 152; Goodell, *Elementary Structures of Political Life*, 161. Lilienthal (*The Harvest Years*, 267) had argued for the necessity of larger land plots for higher yields in a private meeting with the shah on 2 November 1961.

¹²⁵Goodell, *Elementary Structures of Political Life*, 172. Ansari (*Khaterat*, 204) also listed the absence of hospitals and clinics as one of the major complaints of Khuzestanians during his governorship in the mid-1960s.

¹²⁶Goodell, *Elementary Structures of Political Life*, 257.

feet deep so that they were overflowing by 1974.¹²⁷ Mirroring health agents' earlier disgust with the common practice of farm animals sleeping inside villagers' homes, animals were forbidden in *shabraks*. State officials initially forbade residents from building walls around their homes because they wanted to inspect the neatness of these domestic spaces from the street. Officials became increasingly frustrated with the "clutter" that accumulated in yards and began threatening to fine residents in 1974. The Ministry of Water and Power then initiated a campaign to clear the house lots with the claim that cluttered yards fostered schistosomiasis. Later that year, it reversed course and decreed that all homes had to be surrounded by brick walls. Reminiscent of the laborers' quarters in the oil company towns, public health officials apparently felt the importance of homogeneity and regularity superseded that of street inspections.¹²⁸ The *shabraks* also permanently "solved" the sanitation problems of their inhabitants' original villages because officials sent bulldozer teams to demolish them after relocating the residents. These labor towns paradoxically represented maximal state power to intervene in the lives of rural Iranians and minimal ability or will to improve their quality of life. These paradoxes make the state's unconcern for the welfare of rural Khuzestanians clear to an exaggerated degree, clarifying the subtler dynamics at play in the traditional villages.

The Khuzestan Water and Power Authority had only built two more village bathhouses in the Dez Irrigation Project four years after the initial bout of construction in 1963-64, bringing the total to five by 1968.¹²⁹ If many villagers still lived in conditions that propagated disease, it may have been because the state had not yet renovated their villages and they did not have the resources to improve their public health infrastructure on their own. According to a 1968 Ministry of Education survey, 83 percent of villagers in the DIP responded that they would find a doctor in the event of sickness.¹³⁰ Ten years before, very few villagers in the upper Khuzestan plains had any access to doctors. After 1958, the Development & Resources Corporation and Khuzestan Water and Power Authority constructed roads, promoted the purchase of automobiles, and established Mobile Medical Field Units to expand villagers' access to health care, but access was still incomplete. Villagers with medical emergencies requiring immediate care often could not access it and any moderately complicated injuries or diseases still required villagers to travel to Ahvaz or even Tehran. In the early 1970s, residents could do nothing for a dying boy who had ingested pesticide in a village on the edge of the DIP because the only local truck was gone for the day. In another case, a worker at Safiabad collapsed while unloading cement from a truck. The KWPA determined he could not be treated locally and transported him to Tehran. His family did not see him again until after he died, and officials directed his wife to his grave in a public Tehran cemetery after she traveled to the capital to find him.¹³¹

¹²⁷Ibid., 175.

¹²⁸*Shabrak* residents also regularly attempted to keep animals despite regulations. Ibid., 179-80.

¹²⁹Qasemi, *Barrasi*, 38.

¹³⁰Ibid., 39

¹³¹Goodell, *Elementary Structures of Political Life*, 94, 241-2.

Although villagers' access was still far from certain, they had experienced at least somewhat of a conceptual shift concerning the origins of disease. In the same 1968 Ministry of Education survey, villagers were asked to identify causes of disease. Over 72 percent of respondents attributed disease to sanitation and bacteria.¹³² In the village Goodell observed, residents also seemed to prefer modern medical practitioners over traditional medicines or charms.¹³³ Most, or at least many, understood modern notions of disease and wanted modern services but continued to lack reliable access to them. The *shabrak* residents' requests for clinics and bathhouses makes it clear that villagers considered these facilities to be desirable.

Conclusion

This article has presented the case that that Khuzestani villagers generally desired state public health services but their responses to particular initiatives differed according to criteria that had little to do with the source of health services. Villager actions which confounded technocratic plans often did not function in a mode of "resistance" but rather resulted from their continuance of pre-existing modes of living. Despite the desire of villagers in northern Khuzestan for modern medical services, the state's prioritization of economic goals and modernization through sanitization led to the uneven distribution of services and failure to fulfill the expectations of Khuzestan's villagers. After the Dez Irrigation Project began, the economic priorities of public health officials led them to identify schistosomiasis as their top concern, which strongly influenced the public health agenda in northern Khuzestan. Public health agents organized thousands of villagers for nauseating chemotherapy treatments, monitored their routine hygienic practices, and sought to reorganize villages according to ideals of sanitary spatial modernity. This last aspect approached farcical proportions in the early 1970s as villagers were forcibly relocated into labor towns with modern clinics and bathhouses they were prevented from using. These problems of conception and execution frustrated the general desire of villagers for improved health services. Despite official rhetoric of concern for the health of rural communities and scattered projects, Pahlavi public health policy in the 1960s and 1970s remained centered on the "professional salaried and urban working classes," just as it had been in the 1920s and 1930s.¹³⁴

Further research must be completed regarding the role of governmental and non-governmental Iranian organizations in the development of public health in rural Iran, such as the Ministry of Health (and affiliated university institutions like the School of Public Health),¹³⁵ the Red Lion and Sun Society, Queen Soraya's Charity, the Iranian State Railways, the Imperial Foundation, the Iranian Army, and the Workers Social Insurance Organization. The politics of Khuzestani public

¹³²Qasemi, *Barrasi*, 40.

¹³³Goodell, *Elementary Structures of Political Life*, 92, 260.

¹³⁴Harris, *Social Revolution*, 73.

¹³⁵For a brief history of this institution, see Nadim, "School of Public Health," 868-70.

health specifically also deserve more concentrated examination in order to further illuminate aspects of Pahlavi administrative dynamics. While the Development & Resources Corporation briefly considered plans for a central provincial health administration in the beginning stages of planning, it also quickly realized the jurisdiction and scope of such a project would have to be negotiated with existing Iranian stakeholders. Dr. Chamseddine Mofidi, head of the Institute of Parasitology and Malariology in Tehran in 1958, told DRC representatives that he had discussed his own project for schistosomiasis research in Khuzestan with Ebtehaj around the same time the DRC signed its contract with the Plan Organization.¹³⁶ A rivalry between two factions emerged, with the DRC and Ebtehaj on one side and Mofidi with Dr. Naser Ansari (Mofidi's supporter since their University of Tehran days, who was working in the endemo-epidemic section of the World Health Organization in Geneva in 1958) on the other.¹³⁷ Internal DRC loss of interest, contractual terms of agreement between the DRC and the Plan Organization, the dismissal of Ebtehaj from the Plan Organization, and the robustness of Mofidi's professional network in Iran eventually led to Khuzestani public health operations being partially transferred to the Ministry of Health by the mid-1960s. By then, public health activity slowly fades from DRC records and researchers of Khuzestani public health after 1963 will need to more thoroughly consult Iranian sources.

Secondly, this article has not attended to the racial dynamics at hand in this public health program. The Development & Resource Corporation's primary medical concerns in fact lay with the health of their American and European employees and subcontractors. When DRC officials arrived after 1956 and deemed certain Khuzestani medical facilities unfit for company use, they had foreign patients in mind and not Iranian nationals. Colonial modes of health preservation arose, such as advising Euro-American residents to closely monitor the sanitation of Iranian servants lest they infect the family.¹³⁸ Beyond the Iranian-Euro-American divide, foreign officials also at times divided Khuzestanians into Arab and non-Arab groups according to perceived biological and cultural traits that they presumed left each either more resistant or susceptible to particular diseases.¹³⁹

Finally, I was drawn to the Dez development project because of its relevance to Iran's modern environmental history, but that framing is unfortunately muted in

¹³⁶Taylor, "Diary of Trip to Iran," 21.

¹³⁷Carl Taylor, in "Diary of Trip to Iran," 18, explicitly identifies an "intricate network of rivalries and competing personal interests [among the Iranian organizations] ... The Ministry of Health wants credit for whatever is done but does not want to take responsibility. The Institute of Malariology wants both credit and responsibility but it has neither money, personnel, nor resources to carry through the program that is needed. [Dr. Olivier, WHO representative] says that Dr. Mofidi ... is eager to use this Schistosomiasis lever in order to get appropriations from Plan Organization to build up the Institute laboratories into a National Institute of Health."

¹³⁸Satralker, "Health Hazards," 8.

¹³⁹For example, Lilienthal (*Road to Change*, 273) wrote in his diary, "Much as the Gremlizas apparently love the Arabs, they have no illusions about them vis-à-vis the Persians, in teachability, cultural background, etc."

this article. Twentieth century Khuzestan, and the Dez development project alone, contain a great deal of environmental history waiting to be written. For example, foreign and Iranian public health officials identified large bodies of water with little current as important sites of disease transmission and set out to transform those spaces into agricultural (read “productive”) land. These projects to eliminate breeding grounds for mosquitoes and parasites are just one aspect of the transformation of Iran’s wetlands. Unfortunately, my current sources reveal little about these processes. In 1970, one of the chief Iranian public health officials combatting schistosomiasis simply wrote, “Swamps were drained.”¹⁴⁰ In 1972, the same author wrote of “success achieved in ... sanitary modification of the snail habitats.”¹⁴¹ Historical enquiry into this and similar matters might help us better understand the environmental crises Khuzestanians, Iranians, and their regional neighbors face today. Pahlavi officials and their American consultants were already considering the relationship between human activity and phenomena like dust storms in Khuzestan in the 1950s, and flooding has been a persistent theme in regional literature for thousands of years. Research into how Iran’s landscapes have been transformed in the modern era, the logics behind these transformations, and how societal understandings of ecology have changed over time is a critical aspect of fully grasping today’s environmental challenges. More histories of Iran must consider its diverse ecological environments, their relationships to each other, and the supranational aspects of Iranian environmental history.

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¹⁴⁰ Arfaa et al., “Control of Bilharziasis,” 913.

¹⁴¹ Arfaa et al., “Effect of Hycanthone,” 369.

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