THE TIGRIS-EUPHRATES BASIN UNDER EARLY MODERN OTTOMAN RULE, c. 1534-1830

A Dissertation
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By

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ABSTRACT

The early sixteenth century marked the beginning of a rare chapter in the long history of the Tigris and Euphrates rivers. A series of military campaigns between the Mediterranean Sea and Persian Gulf brought the entirety of their flow under Ottoman control. Since late medieval times a landscape of petty quarrels and ephemeral statelets, the drainage basin now became Ottoman under a unified imperial regime, whose leaders pledged allegiance to a single household (the house of Osman), professed a common religion (Sunni Islam), spoke a lingua franca (Turkish), and received orders from a central administration in Istanbul. Based on Ottoman, Arabic, and European archival and narrative sources, this dissertation examines the paradoxical role the Tigris and Euphrates played in the history of the early modern Ottoman Empire.

Following Süleyman I’s conquest of Baghdad in 1534, a governing infrastructure comprising fortresses, shipyards, bridges, and docks developed rapidly, all designed with the joint purpose of cementing the Ottoman presence along the southeastern frontier with Persia. Militarized and policed, the Tigris and Euphrates improved communication and tax collection, expanded the perimeter of food production, and endowed Ottoman armies with a logistical edge over domestic challengers and foreign rivals. Istanbul’s reliance on the Tigris and Euphrates, however, became a source of vulnerability since the late seventeenth century, when the combination of climate change and poorly-conceived water control projects destabilized the Euphrates and threatened to
extinguish Ottoman rule in Iraq. The Tigris-Euphrates system, simply put, was both the backbone of the Ottoman imperial project in the southeastern provinces and a major source of its vulnerability.
Geography without History seemeth a carkasse without motion, so History without Geography, wandreth as a Vagrant without a certaine habitation.

~ John Smith, *The Generall Historie of Virginia, New-England and the Summer Iles*

Man is a product of the earth’s surface. This means not merely that he is a child of the earth, dust of her dust; but that the earth has mothered him, fed him, set him tasks, directed his thoughts, confronted him with difficulties that have strengthened his body and sharpened his wits, given him his problems of navigation or irrigation, and at the same time whispered hints for their solution. She has entered into his bone and tissue, into his mind and soul.

~ Ellen Churchill Semple, *Influences of Geographic Environment*
Acknowledgements

A cycling excursion to Europe inspired Mark Cioc to write his seminal “eco-biography” of the Rhine River. I wish I could share a similar pleasant experience that kindled my interest in the Tigris and Euphrates. The idea for this project, to be quite frank, germinated during my desperate search for a dissertation topic at Yale, where I was a master’s student. Along the way, I had the great pleasure of meeting Alan Mikhail, reading his work about Ottoman Egypt, and learning about the field of environmental history for the first time. Since then, pure curiosity kept me interested in the twin rivers of Iraq. If the Tigris and Euphrates were vital to the development of ancient Mesopotamian civilizations, I mused, what role did they play, if any, in the Ottoman period? To my delight, the question appealed to John McNeill, who recruited me into Georgetown’s doctoral program in history to pursue it. The dissertation herein is the culmination of this intellectual quest to write the Tigris and Euphrates into the history of the post-classical Middle East.

I couldn’t have survived the storm of graduate school alone. Throughout, the extraordinary mentorship of John McNeill has been my rock and anchor. He has sacrificed countless hours of his precious time to meet with me whenever I needed him, sharing his wise counsel and scholarly brilliance. During emergencies, he most kindly made himself available in his office as early as 8 am and as late as 10 pm. I owe the greatest debt of gratitude to him, for his abiding concern for my intellectual and personal growth and his boundless generosity of spirit. Being his student has been one of the greatest honors and privileges of my life.

Three other scholars shepherded this project from inception to completion: Gábor Ágoston, Dina Khoury, and Alan Mikhail. Their erudition aside, they are exceptionally kindhearted. In Washington, D.C., Gábor and Dina always kept their office doors open to me and provided
invaluable guidance. From New Haven and years after I left Yale, Alan continued to treat me as one of his own students and graciously responded to all my queries and requests. My education would have been woefully deficient without their encouragement and insights, for which I am deeply grateful.

The research and writing of this dissertation were supported by Georgetown University, the Institute of Turkish Studies, the Fulbright-Hays Doctoral Dissertation Research Abroad Fellowship, and the Mellon/ACLS Dissertation Completion Fellowship. I am very pleased to acknowledge and thank each of them.

Support from Georgetown was particularly critical. Carolina Madinaveitia administered my academic affairs and ensured that I maintain my good standing in the Ph.D. program. Maria Snyder helped me craft my external grant applications and supervised me during my research trip to Istanbul in 2016-2017. At the Lauinger Library, Maura Seale was the expert who answered most of my research questions and assisted me in acquiring the resources I needed. On different occasions, Artemis Kirk, Brenda Bickett, and Meg Oakley offered additional support. At the Georgetown Law Library, Jelethia Williams and Tracey Thomas hired me part-time in the summers of 2012, 2015, and 2016 so I could make ends meet. My sincere thanks go out to all of them.

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Several scholars did not know me personally, yet they kindly responded to my queries by email. I am thankful to Jeremy Black, Giancarlo Casale, Carrie Hritz, Marc Van De Mieroop, Şevket Pamuk, Geoffrey Parker, David Pietz, Susan Pollock, Elizabeth C. Stone, Kenneth M. Swope, Sam White, and Tuncay Zorlu.

During my research in the United States and overseas, I was fortunate to meet outstanding graduate students, many of whom have become close friends. The friendship of M. Fatih Çalışır and Samuel Dolbee has been particularly sustaining. Others include Clark Alejandrino, Chelsea Berry, Daniel Cano, Graham Cornwell, Kate Dannies, Meredith Denning, Chris Gratien, Zoe Griffith, Selim Güngörüler, Stefan Hock, Adrienne Kates, Michael Christopher Low, Robynne Mellor, Robert Mevissen, Jackson Perry, Graham Pitts, Michael Polczynski, Jeffrey Reger, Hillar Schwertner, Jordan Smith, Alissa Walter, and Elizabeth Williams. I was privileged to be surrounded by them.

The time I spent in Turkey was by far the most enriching aspect of my education. I accumulated an enormous debt to M. Talha Çiçek, who connected me with other Turkish scholars and selflessly guided me through the dizzying labyrinth of Turkish bureaucracy. My fortuitous encounter with Şengül Karaloğlu in the Ottoman Archive was pivotal to my research. She answered all of my questions with aplomb and helped me locate the documents I needed. My daily bout of archival research would have been far less productive and enjoyable without her support and friendship and those of her colleagues: Ayten Ardel, Sevinç Akça, Reyhan Arslan, Meliha Nur Çerçinli, Ülkü Yalçın Dönmez, Ümit Eskin, Mustafa Gökckaya, Salih Kahriman, Uğur Koca, Nurullah Nehir, Fuat Recep, and Ali Toköz. The dedicated staff at other archives and libraries in
Istanbul made my research an equally pleasant experience, including Ramazan Aktemür and Merve Çakır at the Topkapı Palace Museum Library and Nesrin Atabek and Mehmet Çiçek at the Süleymaniye Library. Mevlüde Bakır of the Turkish Fulbright Commission in Ankara helped me acquire my Turkish residency permit in 2017. Their assistance and warmth meant more than words can ever convey.
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Note on Conventions

This dissertation is intended for a broad audience, mainly readers with an interest in the Ottoman Empire, the Middle East, and world environmental history. Whenever possible, therefore, I converted foreign proper names and terms into their Anglicized versions. Thus, I write Rhodes rather than “Rodos”; pasha, not “paşa.” When a popular Anglicized version is lacking, I have followed a simplified version of the International Journal of Middle East Studies transliteration guidelines. I have omitted the diacritical marks and only retained the consonants hamza and ʿayn, indicated by an apostrophe and reverse apostrophe, respectively. For those familiar with linguistic jargon, the hamza, as in the male name Raʿuf, is effectively a glottal stop, and the ʿayn, as in the tribal name Khazaʿil, is a guttural fricative.

Ottoman proper names and terms are rendered according to the rules of Modern Turkish. The pronunciation of most Modern Turkish letters is identical to their equivalents in English, with a few exceptions:

C, c Like “j” in jam 
Ç, ç Like “ch” in church 
Ğ, ğ In most cases a silent letter that lengthens the preceding vowel. “Yağ” (oil), for instance, is pronounced as “yaa.” 
I, i Like “i” cousin 
İ, i Like “ee” in seed 
Ö, ö German ö, like “ea” in early 
Ş, ş Like “sh” in sheep 
Ü, ü German ü, like “u” in cube

Dates in the main text are given in the Common Era. When citing an Ottoman archival document or book, I provide its original Islamic lunar date and the Common Era date, separating
both by a slash. I use the following abbreviations when referring to the twelve months of the Muslim calendar in the footnotes and appendices:

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<td>Muharrem</td>
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<tr>
<td>S</td>
<td>Safer</td>
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<tr>
<td>RA</td>
<td>Rebiülevvel</td>
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<td>R</td>
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Turkish and Iraqi scholars have published several primary sources used in this dissertation. I preferred to rely on the original sources to avoid the problems associated with some published versions, including occasional omissions by editors I later discovered. The incentive to use the original sources was stronger when the published copy is transliterated from the Arabic into the Latin script, a process that renders Arabic and Persian words in the Ottoman text more difficult to recognize. Working with different versions of the same work, my rule of thumb is simple—when I have access to the original and published copies, I include both of them in the Bibliography but only cite the original in the footnotes.

All translations are mine unless otherwise noted.
Introduction: The Waterwheel

In May 1534, Süleyman I left the capital Istanbul and marched toward the Caucasus, the region where he intended to strike his archenemy, Shah of the Safavid Empire Tahmasp I. At his departure, conjectures about what could happen after the military confrontation were many and varied. “Maybe” (belki), people in his entourage thought, Samarkand, Khurasan, Turan, or Baghdad would be next.¹ No one could have predicted that, as the Safavid army retreated deeper into Persia and winter approached, Süleyman would abruptly end the chase and set his sights on Baghdad, which he would triumphantly enter before year’s end. The Ottoman camp had even less inkling that the campaign would unify the entire Tigris and Euphrates rivers under Istanbul’s control. Without forethought and without knowing all the rules and laws of the game, the Ottomans at the twilight of 1534 joined other natural and biological forces governing, and being governed by, the longest rivers in West Asia.

This is an early modern history of the hydro-political union inadvertently forged between Istanbul and the Tigris-Euphrates system. Beginning from the first millennium BC, several great powers in the Near East had claimed sovereignty over the stretch of land drained by the twin rivers. The Ottoman experience, however, differed from all earlier projects of political unification, largely for its reliance on gunpowder weapons. Firepower strengthened Istanbul’s governing hand in a far-flung region, where it could maintain a robust bureaucratic apparatus, intimidate local chieftains, and confront foreign rivals for nearly 400 years.² Human history and water history in

¹ Matrakçı Nasuh, “Beyan-ı Menazil-i Sefer-i Irakeyn,” İstanbul Üniversitesi Nadir Eserler Kütüphanesi MSS T.5964, fol. 4a. The published version of this work is listed in the Bibliography.
² On the role of gunpowder technology in the centralizing projects of early modern empires, see Geoffrey Parker, “Introduction: The Western Way of War,” The Cambridge Illustrated History
the drainage basin became unified under a single imperial order that was more stable and durable than anything that came before it, enforced by field cannon, artillery fortresses, infantry with firearms, and gunboats.

The Tigris and Euphrates were the Ottoman Empire’s primary drainage system in the east, tasked with carrying rainfall and snowmelt from the Taurus and Zagros mountains in the north and delivering them southward to the Persian Gulf (Figure 1). They form the continental arc of a planetary circle through which water swings back and forth between the ocean and the atmosphere. “The rivers flow, the oceans perform their slow and elegant gyrations, the clouds congeal and weep,” a scientist pithily describes the cyclical process. Aşık Mehmed, a sixteenth-century Ottoman geographer from Trabzon, compared the hydrologic cycle, the core concept of modern hydrology, to a spinning waterwheel (dolab).

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Inland areas, such as Lake Van, collected smaller quantities of water. In the Ottoman west, the Mediterranean Sea, either directly or circuitously via the Black Sea and the Sea of Marmara, drained most products of continental weather. See John C. Dewdney, Turkey: An Introductory Geography (New York: Praeger Publishers, 1971), 28-33; Richard F. Nyrop et al., Area Handbook for the Republic of Turkey, 2nd ed. (Washington, D.C.: U.S. Government Print Office, 1973), 63-65.


Aşık Mehmed, “Menazırü’l-Avalim,” Süleymaniye Kütüphanesi, Esad Efendi MSS 2421, fol. 81b. The published version of this work is listed in the Bibliography.
Only a dynamic natural environment, through which water and its constituents—sediment, chemicals, heat, and biota—are constantly on the move, could sustain Ottoman state-building and political survival in the unforgiving deserts of the southeastern provinces. The recycling of water between mountain and ocean formed in effect an enormous transportation network for the efficient distribution of heavy arms and bulk foodstuffs to distant inland fortresses east of the Mediterranean. It improved state policing and tax collection and expanded the combat radius of Ottoman armies. The Tigris and Euphrates, moreover, made growing crops and raising livestock in the arid lands of Iraq possible and nurtured the daily lives of tens of thousands of productive, tax-paying subjects. Paradoxically, efforts to exploit the available supplies and flows of river water had the unintended consequence of exposing Istanbul to the perpetual threat of flood, drought, siltation, salinization, and, most dramatically, channel shifts. Imperial vulnerability to these hydrologic instabilities reached a tipping point at the turn of the eighteenth century, when the
combination of climate change and poorly-conceived water control projects destabilized the Euphrates and caused two channel shifts that would threaten to extinguish Ottoman rule in Iraq. To simplify a complex story into one sentence, the Tigris and Euphrates were the conduits through which Ottoman power flowed, and where it ran aground.

**Space**

Writing a history of the Tigris and Euphrates is an attempt to piece back together a jigsaw that has been broken apart. Even though natural scientists take the physical and biological unity of river systems as an article of faith, the twin rivers appear in most works in the humanities and social sciences as dismembered bodies. In Ottoman historiography, for example, the drainage basin features as an aggregation of national regions and provinces. Studies framed around administrative units illuminated the adaptability of imperial governance in different localities, but rendered the natural world that had spilled over and seeped through them invisible. The Tigris and Euphrates, as a result, have fallen through the cracks of monographs about Anatolia, Syria, Iraq, as well as their cities and provinces.⁶

One aim of this dissertation, therefore, is to demonstrate the utility of the Tigris and Euphrates not only as geographical and biological units, but also as categories of historical analysis. Nearly four decades ago, the late Robert Adams, former Secretary of the Smithsonian and one of the greatest archaeologists of his generation, hinted at the potential rewards of writing

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a history of both rivers, noting: “A watershed is only another topographic unit, of course, and need never have coincided with a historical and cultural unit of any significance. But in this case there are many leads to a recurrent unity within the Euphrates basin that deserve to be explored, even if that far-ranging task cannot be adequately undertaken here.” Among those recurrent episodes of historical and cultural unity, that forged by the Ottoman Empire is the subject of this study.

As spatial frameworks, the Tigris and Euphrates uncover processes and movements that politically-bounded studies have obscured, such as the role of Anatolian grains, their market expanded by river transport, in promoting urbanization in Iraq. A holistic approach to the fluvial system reveals, in addition, how drought in Diyarbakır could trigger flood in Baghdad, and how security anxiety downstream spurred the development of a naval industry along the upper Euphrates. The intimate bonds between the northern and southern stretches of the drainage basin explain why Istanbul itself had viewed and managed the Tigris and Euphrates as an intertwined human and political entity. The panoramic vision of the imperial administration is evident not only in countless documents dealing with water transport, but also in a remarkable eleven-foot-long map drawn on eight double folio sheets in the middle of the seventeenth century (see Figure 2).

The map features the entire river system, from the Taurus and Zagros mountains (right) to the Persian Gulf (left), and indicates the major routes, settlements, and holy sites in-between. To come

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to grips with the complex history of this broad region, therefore, historians must take heed of how the Ottoman state coordinated its management as a unified whole.

The geographical ambition of the project’s scale notwithstanding, every chapter uses local case studies to highlight how riparian (streamside) towns and villages, in their concrete natural and social settings, experienced the broader process of Ottoman integration differently. Along the way, readers will encounter a boom in the raft-making industry of Diyarbakır and Mosul, the establishment of shipyards in Birecik and Basra, the formation of corps of hydraulic engineers in Baghdad, and the rise of an autonomous tribal confederation in the marshes of Hasaka and Lamium. The common thread running through all these local stories was the domination of the Tigris-Euphrates basin by one political behemoth based in Istanbul.

Operating on an unconventional spatial scale invites an unconventional vocabulary. The area of land drained by the Tigris and Euphrates lacks a general historical name. In the following chapters, I will refer to it, as I have done so far, as the drainage or river basin, a geological term synonymous with watershed in North American usage and with catchment area in other parts of the world. The common thread running through all these local stories was the domination of the Tigris-Euphrates basin by one political behemoth based in Istanbul.

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refer to as the alluvial plain, the stage where the orchestra of irrigation and navigation preferred to play before the age of fossil fuels. Geologically, the alluvium is the extensive geosyncline south of the Hit (Euphrates)-Tikrit (Tigris) line, boxed in by the rocky scarps of the Arabian desert along the south-western flank, the marshes of Basra and Khuzistan on the southeastern boundary, and the Jabal Hamrin hill range on the northeast (see Figure 3). Historically, the alluvium roughly corresponds to the ancient lands of Sumer and Akkad, the Ottoman provinces of Baghdad and Basra, and Iraq, as the name was understood in most of the pre-modern era.\textsuperscript{10}

Figure 3. The Tigris-Euphrates Alluvial Plain

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure3.png}
\caption{The Tigris-Euphrates Alluvial Plain}
\end{figure}

\begin{flushright}
Credit: Faisal Husain, 2018.
\end{flushright}

\textsuperscript{10} Katib Çelebi (d. 1657) explicitly states that Arab Iraq (\textit{Irak-i Arab}) is comprised of the Baghdad and Basra provinces. See Katib Çelebi, \textit{Cihannüma} (Istanbul: Darü’-Tıbaati’l-Amire, 1145/1732), 451. I use Iraq, Mesopotamia, Baghdad and Basra, the alluvial plain, and the alluvium interchangeably.
Time

Geological transformation 50 to 30 million years ago created the Tigris-Euphrates basin. The catalyst was pressure from the Arabian shield in the southwest, which forced the Asiatic landmass in the northeast to fold and raise the Zagros and Taurus mountains. In the deep trench that emerged between the two plates, perennial streams eroding the mountains built up the alluvial plain and eventually morphed into the Tigris-Euphrates system.\textsuperscript{11} The process was millions of years in the making, during most of which the lower stretches of both rivers formed a single network of interwoven channels (see Figure 4). Only after the fourth millennium BC did the river system partition into its two discrete courses, following abrupt channel shifts and intensified sedimentation that accompanied the expansion of Sumerian irrigation networks.\textsuperscript{12}


The history of the drainage basin as an Ottoman entity is much briefer and more recent. Nearly three decades sufficed to bring the region under Istanbul’s authority by force. The military campaigns culminated in the conquest of Baghdad in 1534, the turning point with which this study begins. Ottoman efforts to utilize both rivers for broader imperial designs henceforth developed rapidly. The instructions and law codes Süleyman I formulated following his arrival in Iraq would serve as a blueprint for future river management activity.

The story told herein draws to a close when the dynamics of Ottoman dominance in the Tigris-Euphrates basin thoroughly changed at the turn of the nineteenth century. The process was gradual and cannot be ascribed to a particular year. One by one, the pillars upholding the early modern Ottoman order founded by Süleyman I would crumble—first the sheep and water buffalo herders’ associations of Baghdad, and later the imperial naval squadron along the Euphrates and
Shatt al-Arab, access to the military industrial complex of Istanbul, and the janissary corps tasked with manning riverine fortresses. In their place, a new Ottoman order emerged in the region, governed by a restructured imperial bureaucracy and a new vision of the world, both deeply influenced by Western ideas and institutions.

**Putting in My Oar**

Kenneth Burke, a philosopher of language, once compared the world of intellectual exchange to an endless conversation at a parlor. “You come late. When you arrive, others have long preceded you, and they are engaged in a heated discussion, a discussion too heated for them to pause and tell you exactly what it is about… You listen for a while, until you decide that you have caught the tenor of the argument; then you put in your oar. Someone answers; you answer him; another comes to your defense; another aligns himself against you, to either the embarrassment or gratification of your opponent, depending upon the quality of your ally’s assistance… The hour grows late, you must depart. And you do depart, with the discussion still vigorously in progress.”

Carrying this dissertation, I belatedly enter a parlor dominated by two conversations. The first unfolds among Middle East historians about the environmental decline of the Tigris-Euphrates basin, set in motion between Abbasid civil wars in the ninth century and the *coup de grâce* administered to Baghdad by Hülegü’s horsemen in 1258. To corroborate the story, several

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scholars display tables that document a continuous drop in tax assessments in Iraq as an indication of falling crop yields.\textsuperscript{15} My intervention in this circle suggests that falling crop yields largely reflect a decline in wheat and barley production rather than in the natural environment as a whole. A more cogent assessment of environmental conditions, I suggest in the following chapters, would offer a multi-dimensional view of the alluvial plain that takes into account the role of not only arable lands, but also grasslands and wetlands. Relying on multiple ecological zones, the local inhabitants farmed in crop-fallow rotation, combined cultivation with animal rearing, and converted wetlands into rice paddies. Through these and other ingenious strategies, they compensated for the deterioration of large-scale irrigation systems. Thus, I argue that resilience and adaptation, rather than ecological decline, were the hallmarks of life in the early modern Tigris-Euphrates basin.

The second conversation I engage with plays out among Ottoman historians. In the past two decades, the discussion has steered towards the remarkable longevity of the empire; how it managed to rule diverse populations based in three continents for six centuries. A group of historians has emphasized the formation of Ottoman social capital along the Byzantine-Seljuk frontier during the fourteenth century, a network of relationships brokered across religious and cultural boundaries through war, trade, accommodation, and marriage. At the center of the network, members of the Ottoman household successfully manipulated previously unconnected social groups to further their political project.\textsuperscript{16} The idea of the Ottoman Empire as a brokered


enterprise has recently featured in studies of the seventeenth and eighteenth centuries. The development of a monetized market economy in this period, according to Baki Tezcan, empowered the authority of jurists and the janissaries and opened the door for new members of Ottoman society to join the ranks of the ruling elites through financial entrepreneurship. The process, which Tezcan describes as “proto-democratization,” weakened royal authority but created a stronger state whose legitimacy was more widely recognized throughout the empire. Following in Tezcan’s footsteps, Ali Yaycioglu has argued that the Ottoman state survived challenges to its survival in the age of revolutions (c. 1760-1820) by pursuing reforms based on partnerships and constitutional ties between central and provincial actors.

Alternative theories of imperial longevity abound. Some scholars emphasized the omnivorous nature of Ottoman rule in frontier regions, which refrained from imposing a uniform system of government in favor of incorporating existing local institutions, power-holders, legal customs, and procedures for revenue management. Economic historians focused on the evolution of Ottoman public finance. By successfully revamping its fiscal institutions and internal-borrowing systems, they have shown, the empire weathered the economic crises of the seventeenth and eighteenth centuries. Logistical strengths and receptivity to gunpowder technology, according to

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military historians, allowed the Ottoman army to keep pace with European rivals until the end of
the seventeenth century.21 Regardless of the theory, the air in this lively conversation is thick with
the buzzwords “pragmatism,” “flexibility,” and “adaptability” in reference to Ottoman rule in the
early modern period.

This dissertation aims to bring an environmental approach to the longevity debate in
Ottoman historiography. The durability of the Ottoman imperial project in the southeastern
provinces, it contends, rested on the political unification and successful management of the Tigris-
Euphrates system. In fact, much of the history of Ottoman Iraq, I hope to show, can be told through
the history of the Tigris and Euphrates. The flow of water in both river channels endowed Istanbul
with two critical advantages, among numerous others. First, it supplied a free and renewable source
of energy that Ottoman bureaucrats regularly tapped to transport men and provisions along the
eastern frontier, knitting Iraq to the rest of the Ottoman world in the process. Separated by an
arduous overland route of more than 1,000 miles, Istanbul could not have held Iraq for too long
without an efficient system of inland water transport (see Figure 5). Sooner or later, it would have
slipped away from Ottoman control to fall under the influence of a local warlord, tribal leader, or
the Safavid capital cities of Qazvin and Isfahan, both located less than 500 miles away. Second, to
the parched deserts of Iraq, the Tigris and Euphrates carried the gift of life. River water maximized

Khoury, *State and Provincial Society in the Ottoman Empire: Mosul, 1540-1834* (New York:
21 Gábor Ágoston, *Guns for the Sultan: Military Power and the Weapons Industry in the
Ottoman Empire* (New York: Cambridge University Press, 2005); Gábor Ágoston, “Firearms and
Military Adaptation: The Ottomans and the European Military Revolution, 1450-1800,” *Journal
of World History* 25, no. 1 (2014): 85-124; Rhoads Murphey, *Ottoman Warfare, 1500-1700*
(New Brunswick: Rutgers University Press, 1999); Caroline Finkel, *The Administration of
Warfare: The Ottoman Military Campaigns in Hungary, 1593-1606* (Vienna: Verband der
Wissenschaftlichen Gesellschaften Österreichs, 1988); Jonathan Grant, “Rethinking the Ottoman
‘Decline’: Military Technology Diffusion in the Ottoman Empire, Fifteenth to Eighteenth
the food production capacity of an otherwise barren region. Its symbolic and strategic values aside, Iraq became, as a result, economically significant in the eyes of the Ottoman administration, the grazing ground of more than a million goat and sheep and home to one of the largest date orchards in the world.

Figure 5. Distance from Istanbul (Miles)


Sources

I visited Istanbul for research for the first time in the summer of 2013. Countless scholars before me, from around the globe, had flocked to the city in search for Islamic manuscripts. On one occasion in the early eighteenth century, booksellers struggled to meet the excessive demand of
consumers, leading Ottoman authorities to ban the sale of books to foreigners.22 Despite the inveterate greed of international researchers, Istanbul continues to shelter an astounding trove of material sources from around the Muslim world. After conducting a survey in the early twentieth century, the German orientalist Hellmut Ritter (d. 1971) estimated that the city’s libraries had about 124,000 Arabic, Persian, and Turkish manuscripts. The figure, as one might expect, astonished him. “How could you collect all these books?” he asked Hoca Şerefeddin, whom he identified as “the last great theologian of Turkey.” The answer Ritter received was remarkably candid: “with the sword” (*bisseif*).23

Hoca Şerefeddin had a point. The same guns that helped Istanbul to integrate the Tigris and Euphrates into the Ottoman Empire ensured that the city would regularly receive from the east tribute, severed heads of defeated rebels, and countless documents that form most of the source base for this dissertation. Among the archives and manuscript libraries that house these documents today, the Prime Ministerial Ottoman Archive (*Başbakanlık Osmanlı Arşivi*) in Kağıthane, Istanbul is the largest, boasting about 150 million documents and registers.

Most of the archival sources consulted for this project originated from four state departments. Central to all of them is the Grand Vizierate (*Bab-ı Asafî* or *Bab-ı Ali*), once known throughout Europe as the “Sublime Porte.” Its building, a stone’s throw from the royal Topkapı Palace, used to be the private dwelling of the Grand Vizier. In the early eighteenth century, however, the Porte supplanted the Topkapı as home to the central offices of the Ottoman government and as the archival repository for the Imperial Council (*Divan-i Hümayun*). The most

important archival source the Porte came to possess after the transition, as far as this dissertation is concerned, were the Registers of Important Affairs (mühimme defterleri). Each register in this collection is a compilation of royal edicts issued by the Imperial Council on behalf of Ottoman sultans to all provinces throughout the empire. Most edicts are prefaced by summaries of letters sent from the provinces, a feature that allows researchers to glean the perspectives of Istanbul and the provinces on different events. Today, the Ottoman Archive has 419 of these registers, covering the period between 1553 and 1915.\footnote{Yusuf İlhan Genç, Mustafa Küçük, Raşit Gündoğdu, Sinan Satar, İbrahim Karaca, Hacı Osman Yıldırım, Başbakanlık Osmanlı Arşivi Rehberi (İstanbul: Başbakanlık Basımevi, 2010), xxxii, 7.}

The second state department germane to the subject of this study is the Imperial Land Registry (Defterhane-i Amire), which operated under the supervision of the chancellor (nişancı). Its archive contains land surveys, prebend (timar) registers, and endowment transactions that guided the decision-making process of the Imperial Council during its meetings. Among its holdings, the cadastral surveys (tapu tahrir defterleri), the Ottoman equivalent of the English Domesday Book, are particularly useful. After the early fifteenth century, whenever Ottoman armies conquered a new territory, the Imperial Land Registry instructed deputies to compile a comprehensive survey of the land, primarily its population and revenue sources. When conditions in the region changed for any reason, officials compiled new surveys to update the old ones. Some 3,400 cadastral surveys have passed down to us as a result of this painstaking effort, many of which are kept in the Ottoman Archive in Istanbul, but the majority have been inherited by the General Directorate of Land Registers and Cadasters (Tapu ve Kadastro Genel Müdürlüğü) in the capital Ankara.\footnote{Genç et al., Başbakanlık Osmanlı Arşivi Rehberi, 97-99. For the origins of the cadastral surveys, see İnalçık, “Ottoman Methods of Conquest,” 109-112.}
shortcomings, but by the standards of the pre-industrial Middle East, their scale and depth are unparalleled.

Following pioneering works by Ömer Lütfi Barkan (d. 1979) and Lajos Fekete (d. 1969) in the 1940s, the cadastral surveys gave rise to an entire subfield within Ottoman studies—defterology—that flourished between the 1970s and 1990s but has been ever since in a state of torpor. The unfortunate lack of interest in these sources today, which Barkan described as “the most precious possession of the Turkish archives,” may have to do with natural shifts in scholarly winds, as well as the inability or unwillingness of most Ottomanists to read the specialized chancery script (siyakat) in which they were typically written. This dissertation constitutes a modest attempt to revive the subfield through a systematic analysis of more than a dozen cadastral surveys from Anatolia, Syria, and Iraq. It aims, moreover, to demonstrate how historians can enlist the cadasters, used in the past primarily to chart demographic and economic trends, to write environmental histories of the early modern Ottoman Empire. Part II relies on the little-studied cadasters of Baghdad and Basra to reconstruct the biomes and subsistence strategies prevalent in

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the Tigris-Euphrates alluvium. Reading the land surveys with a fresh, ecological eye contributes to defterology studies by bringing to light the critical role of flora, fauna, and even fungi that have traditionally escaped the consideration of economic historians due to their low value relative to grain crops, such as grass and desert truffle.

The two remaining state departments whose archival sources made this study possible are the Financial Registry (Bab-i Defteri) and Baghdad Council (Divan-i Bağdad). Among its many responsibilities, the Financial Registry oversaw provincial branches of the Imperial Treasury (Hazine-i Amire) and Imperial Naval Arsenal (Tersane-i Amire), whose records add more depth to our understanding of local conditions in the provinces. As for the Baghdad Council, its records are patchy and dispersed among the Ottoman Archive’s oldest catalogues (Ali Emiri, İbnülemin, and Cevdet), yet they offer rare local insights that no other state department does. Headed by the governor and attended by the local judge and senior officials, the council received petitions (arzuhal) from men and women discussing the intricate legal and environmental details of a variety of subjects, particularly land tenure and irrigation in the countryside.28

Last but not least, Arabic, Ottoman, and European chronicles and travel accounts complement archival sources and give life to their numerical and technical information. Among them, three are particularly illuminating and deserve mention: the Ottoman travelogue of the renowned author Evliya Çelebi (d. after 1685), an Ottoman chronicle of Baghdad by the city’s chancellor (ruznameci) Murtaza Nazmizade (d. c. 1722), and an Arabic biography of Baghdad’s governors Hasan Pasha (r. 1704-1724) and Ahmad Pasha (r. 1724-1747) by the Sunni cleric ‘Abdulrahman al-Suwaydi (d. c. 1785). All of Çelebi, Nazmizade, and al-Suwaydi had access to

28 Provincial governors throughout the empire held similar sessions to hear petitions from local subjects. See Yuval Ben-Bassat, Petitioning the Sultan: Protests and Justice in Late Ottoman Palestine (London: I.B.Tauris, 2013), 31.
archives of the Baghdad provincial administration, a privilege that made their works exceptionally rich in detail and valuable to historians.

Alas, more than three decades of war and authoritarian rule have ravaged large parts of the region under study and have taken their toll on their populations and cultural heritage, including precious archival collections. The experience of Iraq, the country to which the Tigris and Euphrates have been of most vital importance throughout history, is particularly tragic.29 One of the goals of this dissertation, therefore, is to suggest strategies to overcome the enormous loss and damage the Iraqi archives have sustained, notably the Islamic court records, sources that historians of other Ottoman provinces take for granted. Through a judicious combination of archival sources and literary accounts produced by different arms of the Ottoman state and different authors, historians can write fairly comprehensive monographs of the Tigris-Euphrates basin and their provinces before the nineteenth century. The available source material, nevertheless, is written mostly by bureaucrats and makes the study herein an imperial history, where the Ottoman state is front and center.

Outline

The dissertation is comprised of three parts. Part I (Chapters 1 and 2) focuses on the establishment and transformation of the infrastructure of riverine control, primarily fortresses and gunboats. It documents the mobilization of labor and natural resources to construct and staff both types of facilities and the political consequences of their development. By river, land-bound Ottoman

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garrisons acquired ready supplies of food and weaponry to concentrate and project their power over populations of the drainage basin.

Part II examines how the Ottoman Empire used its military superiority in the region to cash in on the land-based wealth of the alluvial plain, where the Tigris and Euphrates were most consequential for farming activities. In three chapters (3, 4, and 5), it details imperial policies to regulate, support, and tax communities based in arable lands, grasslands, and wetlands. The bio-productivity of these three zones endowed the state with a firm economic and political footing in the alluvium. Food and revenue shortfalls from one zone caused by natural disaster could easily be offset by inflows from elsewhere. The Ottoman presence in Baghdad and Basra owes its resilience, in part, to a policy that generally pursued accommodation with ecological diversity over unbridled agrarian ambitions.

Finally, Part III (Chapters 6 and 7) documents the extreme ramifications of Ottoman environmental management in the alluvial plain that manifested themselves in two channel shifts in the Euphrates at the turn of the eighteenth and nineteenth centuries. Based on tree-ring analysis, court records, and chronicles, my findings in Chapter 6 demonstrate that the first channel shift was triggered by a combination of an unsuccessful river diversion and the climatic regime of the Late Maunder Minimum (1675-1715). Chapter 7 is a microhistory of the Hasaka and Lamlum marshes in the Middle Euphrates, which formed following the channel shift discussed in the previous chapter and served the Khaza’il tribal confederation as a political ally and ecological niche during its struggle with the Ottoman administration in Baghdad. The Khaza’il-Ottoman conflict, characterized by each side’s reliance on hydraulic warfare to defeat the other, contributed to another channel shift that, I argue, facilitated the revival of the shrine city of Najaf and the consolidation of Shi’ism, anathema to the staunchly Sunni Ottomans, as a majority religion in Iraq.
Hydrologically volatile after the late seventeenth century, the Euphrates suddenly unleashed chaos and nearly brought Ottoman rule in the alluvial plain to an end. The empire would persist against all the odds, but it would have to come up with new solutions to deal with a new fluvial landscape and new challenges. Together, they mark the end of our early modern story.
PART I: INFRASTRUCTURE OF CONTROL

Militarized fortresses and gunboats anchored Ottoman political authority between the Taurus Mountains and Persian Gulf. With them, Istanbul could wage warfare that involved the cooperation of two specialized hierarchical organizations—army and navy. If rivers were “organic machines,” as Richard White described the Columbia, fortresses and gunboats were the central cogs of the early modern Tigris-Euphrates basin. At the barrel of a gun, the Ottomans controlled the system of waterborne communication and confronted domestic and foreign challenges to their hegemony. The next two chapters outline the role of fortresses and gunboats in upholding the Ottoman imperial order in the region.

The ultimate claim of Part I is that the energies and resources of the Tigris-Euphrates system conferred to the Ottoman Empire a competitive advantage and a logistical edge over its rivals. Wind and river currents extended the distances over which Istanbul could field heavy artillery, food supplies, and troops along the eastern frontier. One of the reasons the Safavid Empire was less successful in adopting gunpowder technology, on the other hand, was the Iranian Plateau’s general lack of navigable waterways like the Tigris and Euphrates, a natural deficiency that made the business of provisioning an army with field guns much more difficult. Ottoman armies in the east, as a result, tended to be better armed and fed than their Safavid rivals and could keep Iraq, with brief interruptions, under Istanbul’s tutelage until the outbreak of World War I.

32 Baghdad and Basra briefly fell to Persian forces in 1623-1638 and 1776-1779, respectively.
Chapter 1: Fortresses Built on Water

“For a lover, even Baghdad is not too far” (Aşığa Bağdat uzak değil).

~ Turkish proverb

In December 1564, a religious lawyer from Istanbul by the name Mevlana Yakub was preparing to take up his new post as the imperial judge of Baghdad City. His belongings included one letter furnished by the Ottoman Imperial Council, written in Turkish and addressed to all provincial notables and judges serving between Istanbul and Baghdad (see Figure 6). “When he enters your jurisdiction,” the letter read, “provide a sufficient number of people to accompany him in dangerous and frightening roads and help him reach the well-protected city [of Baghdad] safe and sound. You should know this!”

Figure 6. Copy of the Letter Handed to Mevlana Yakub, 1564

Source: BOA, MD 6, no. 549, p. 258 (27 CA 972/31 December 1564).

The original text reads as follows: “her kankınuzun takht-i hükümetine dahil olursa muhavvif ve muhatare olan yerlerde kifayet mikdari adem koşup emin ve salim mahruse-i mazbureye ulaştırsın. Şöyle bilesin.” BOA, MD 6, no. 549, p. 258 (27 CA 972/31 December 1564).
The terse letter leaves us oblivious to the details of the itinerary, but Mevlana Yakub must have followed one of two routes to reach his destination—the Tigris and Euphrates. For millennia, the stream of humanity moving between Anatolia and Mesopotamia flowed along these two arteries, which provided travelers the necessary access to water and a degree of security and convenience in their journey across the inhospitable Jazira desert. In the sixteenth century, the communication networks of antiquity carried on, but they had to reorient themselves to a new Middle East. A radical political realignment placed the reins of the entire Tigris and Euphrates—the great transport corridors of West Asia—in the hands of Istanbul. At the stroke of a pen, Mevlana Yakub and countless other diplomats, merchants, and artisans gained safe passage from the Mediterranean to the Persian Gulf. Similar decrees moved armies, along with their food and heavy equipment, between the northern and southern ends of both rivers.

This chapter outlines the steps taken by Istanbul to maximize its political and financial gains from the roads laid down by the Tigris and Euphrates waterways. The Ottoman system of river transport, it argues, boosted the clout of fortified cities in the drainage basin and equipped them with the resources necessary to subordinate the countryside and repel foreign enemies. The twin rivers, in other words, made Ottoman state building on the southeastern frontier possible. My aim is to highlight the fact that cities cannot be adequately understood without reference to their environmental setting. In drainage basins, cities and rivers often function like specialized organs within the same body, their relationship being regulated by the reciprocal exchange of water, sediment, and organic matter. Changes in one have consequences for the other, and vice versa. Just as London and the Thames, Paris and the Seine, and Vienna and the Danube cannot be held apart

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without dismembering a natural whole, the history of Baghdad and Basra, this chapter demonstrates, cannot be separated from the history of the Tigris and Euphrates.

**Conquests**

The Ottoman unification of the Tigris-Euphrates basin was inadvertent, the byproduct of successful military campaigns waged by Selim I (r. 1512-1520) and Süleyman I (r. 1520-1566). Dedicated to continuous warfare against the infidel world, Osman I (d. 1326) and his successors cut their military teeth on the western front fighting different Christian powers, initially the Byzantines and later the Habsburgs and Russians. When turning against their Muslim neighbors in the east, they justified their campaigns by casting their coreligionists as backstabbers, traitors to the sacred cause of expanding the abode of Islam and gaining new converts. Alaeddin, the Türkmen emir of Karaman, paved the ground for the first Ottoman advance towards the upper Euphrates when he raided Ankara in late 1396 while Bayezid I (r. 1389-1403) was fighting Crusaders at Nicopolis. After a decisive victory against his Christian adversaries, Bayezid, known as the Thunderbolt (*Yıldırım*), marched swiftly to the east, occupied the Karamanid city of Konya, and turned against other Anatolian emirates, extending his rule to the western Euphrates region between Erzincan in the north and Behesni in the south (see Figure 7). The Ottoman presence

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along the river quickly unraveled, however, following the routing of Bayezid by Timur at the Battle of Ankara in July 1402.37

Figure 7. The Area Conquered by Bayezid I, 1389-1402

Based on Donald Edgar Pitcher, An Historical Geography of the Ottoman Empire from Earliest Times to the End of the Sixteenth Century, with Detailed Maps to Illustrate the Expansion of the Sultanate (Leiden: E.J. Brill, 1972), Map XI. Credit: Faisal Husain, 2018.

Ismail I (r. 1501-1524), founder of the Safavid Empire, provided the pretext for the Ottomans to return to the upper river basin and reclaim the lands they lost a century earlier. The young shah’s success and charisma won the allegiance of thousands of Türkmen tribesmen in Anatolia, who waged a devastating anti-Ottoman rebellion in the spring of 1511 under the leadership of a certain Karabıyıklıoğlu Hasan Halife, publicly known as Shah Kulu (“Slave of the

37 Donald Edgar Pitcher, An Historical Geography of the Ottoman Empire from Earliest Times to the End of the Sixteenth Century, with Detailed Maps to Illustrate the Expansion of the Sultanate (Leiden: E.J. Brill, 1972), 54-55.
Shah”) and in Ottoman circles as Şeytan Kulu (“Slave of the Devil”). Prince Selim openly blamed the havoc on his ailing father Bayezid II (r. 1481-1512) for his cautious policy that avoided open conflict. Backed by the janissaries (elite infantrymen), the prince forced his father to relinquish power in Istanbul and secured the Ottoman throne in April 1512. The Grim (Yavuz), as Selim was later known, needed two years to hunt down and kill his brothers and nephews and exterminate 40,000 Shi’is in Anatolia before facing off with Ismail at Chaldiran in the summer of 1514. Following an overwhelming Ottoman victory, he relied on the brute force of his general Bıyıklı (“the Mustachioed”) Mehmed Pasha and the diplomatic activity of his Kurdish envoy İdris of Bitlis to expunge all remnants of Safavid influence in Anatolia and Syria. By May 1516, when Bıyıklı Mehmed Pasha defeated and murdered the Safavid commander Ustajlu Karahan in the battle of Kargındede, the regions east of the Euphrates between Erzurum and Raqqa and along the Tigris between Diyarbakır and Kirkuk fell under the sway of Istanbul (see Figure 8).

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38 Bayezid II’s forces had eliminated Shah Kulu by the time Selim secured the throne.
Selim’s next target was the Mamluk Empire, then the custodian of Mecca, Medina, and Jerusalem and the most esteemed polity in the Muslim world. Relations between the two powers were already tense due to recent Ottoman expansion into a buffer zone dominated by satellite dynasties of Cairo, the Ramazanoğlu in Adana and the Dulkadiroğlu in Elbistan. In June 1516, Selim left Istanbul and set out for Syria, accusing the Mamluk Sultan Qansawh al-Ghawri of harboring fugitive challengers to his throne and of conspiring with the Shi‘i Safavids to form an anti-Ottoman alliance. The two met in Marj Dabiq at the northern outskirt of Aleppo in late August, where Selim emerged victorious, securing the western Euphrates bend between Divriği and Rumkale and clinching his control over the entire upper basin (Figure 8).

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The lower drainage basin would remain in Safavid hands until Süleyman I’s expedition to the east in 1534-1535. Writing a century after the event, the renowned Ottoman traveler Evliya Çelebi (d. after 1685) claimed that the idea of conquering Iraq came to the sultan one night in a vision. Forty Muslim saints implored him while he was asleep: “Süleyman! Come to Baghdad and save us from the Qizilbash,” in reference to pro-Safavid Türkmen tribesmen.\textsuperscript{41} Contemporary sources, however, say nothing about the anti-Safavid dream. Instead, they highlight, as they do for the previous eastern campaigns, two stabs in the back made by Shah Tahmasp I (r. 1524-1576) while Süleyman was campaigning in the Hungarian front. The first occurred in the summer of 1529 when Tahmasp assassinated Zülfikar Khan for declaring Baghdad an Ottoman dependency after murdering the city’s Safavid governor, who happened to be his uncle. War with Persia became inevitable after the Ottoman ruler of Bitlis defected to the Safavid camp in 1530 and Tahmasp recognized him as his governor in the city and the surrounding lands west of Lake Van. Adding fuel to the fire of tensions were regular letters and embassies from the east urging Istanbul to invade Iraq and Iran as Tahmasp, then a teenager, struggled to deal with a civil war among different Qizilbash factions and Uzbek invasions. Süleyman heeded their calls soon after signing a truce with the Habsburgs in 1533 that retained the division of Hungary between two Ottoman tributaries. He dispatched his Grand Vizier İbrahim Pasha to Bitlis and joined him in Tabriz a year later. In early December 1534, the sultan entered Baghdad unopposed, forcing its Safavid governor to flee for his life to Persia. Local chieftains throughout Iraq, including Basra, flocked to the city to submit to their new imperial masters. In 1546, Baghdad’s Ottoman governor Ayas Pasha would

reinforce Ottoman authority in Basra by dislodging an unreliable vassal and bringing the city under the direct control of Istanbul (see Figure 9).

Figure 9. The Areas Conquered by Süleyman I, 1520-1566

Historians have examined the political and cultural ramifications of the Selim’s and Süleyman’s eastern campaigns between 1512 and 1534, most of which corollary to the fact that new possessions in predominantly-Muslim West Asia and North Africa came to overshadow the Ottoman traditional foothold in Christian Europe (see Table 1). According to one popular

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formulation, the incorporation of the Arab heartland and the holiest sites in Sunni Islam (Mecca, Medina, and Jerusalem) paved the way for the Ottoman transition from an open, syncretic, and flexible frontier principality to an increasingly conservative empire given to “the forces of religious fanaticism.” Others have highlighted the role of new acquisitions as a platform for projecting Ottoman sea power in the Indian Ocean. By focusing on the Tigris and Euphrates, this and the following chapters will demonstrate how Ottoman eastern expansion in the early sixteenth century had profound environmental implications no less important than the political and cultural ones.

Table 1. Lands under Central Ottoman Control (Square Miles)

<table>
<thead>
<tr>
<th>Date</th>
<th>Asia</th>
<th>Europe</th>
<th>Africa</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300</td>
<td>3,500</td>
<td></td>
<td></td>
<td>3,500</td>
</tr>
<tr>
<td>1389</td>
<td>50,200</td>
<td>50,600</td>
<td></td>
<td>100,800</td>
</tr>
<tr>
<td>1451</td>
<td>115,100</td>
<td>102,900</td>
<td></td>
<td>218,000</td>
</tr>
<tr>
<td>1512</td>
<td>176,200</td>
<td>164,900</td>
<td></td>
<td>341,100</td>
</tr>
<tr>
<td>1566</td>
<td>462,700</td>
<td>224,100</td>
<td>191,000</td>
<td>877,800</td>
</tr>
</tbody>
</table>

Source: see Appendix A

**Communication**

Settlements in the drainage basin existed within a nested hierarchy. By controlling the few in the upper echelons of the pyramid, Istanbul could easily extend its rule to the lower-order towns and villages and the waterways between them (see Figure 10). Diyarbakır, the largest on the Tigris,

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43 İnalçık, *The Ottoman Empire*, 179-185. See also Lowry, *The Nature of the Early Ottoman State*, 131-143.
45 The following discussion excludes fortresses in the mountainous Kurdish region that played a minor role in controlling the main river channels, such as Zalm, which served as the center of the influential Şehrizor Province in the sixteenth century. On Zalm and Şehrizor, see Mehdi İlhan,
dominated the upper stretches of the river to the borders of Baghdad until 1586, when one of its
districts, Mosul, became an independent province. The redrawing of political boundaries, recurrent
throughout the sixteenth century, effectively placed the upper Tigris under the jurisdiction of both
Diyarbakır and Mosul, bordering each other around Cizre. The Euphrates lacked fortresses
comparable in size to those on the Tigris. Early on, its upper stretches fell under the sway of
Aleppo, the third largest city in the empire after Istanbul and Cairo. After the formation of the
Raqqa province in 1586, the upper Euphrates oscillated between the spheres of Aleppo and
Raqqa. As the rivers came near to each other in the alluvial plain, Baghdad in the north and Basra
in the south could dominate the remaining segments of both, sharing an administrative border
along the Gharraf River. What Diyarbakır, Mosul, Aleppo, Baghdad, and Basra shared in common
was a sizeable taxpaying population, each exceeding 3,000 persons (see Table 2). Given that, in
Ottoman administrative practice, a taxpayer in the majority of cases was an adult male, the total
population in each fortress, including women, children, and the tax-exempt, was well over
15,000. Through different types of investment, imperial policy capitalized on the distinctive

“XVI. Yüzyılda Şehrizol Vilayeti,” Ankara Üniversitesi Osmanlı Tarihi Araştırmaları ve Uygulama
23-34; Ahmet Gündüz, Osmanlı İdaresinde Musul (1523-1639) (Elazığ: Fırat Üniversitesi
Basımevi, 2003), 32-43.
47 See Ali Yılmaz, “XVI. Yüzyılda Birecik Sancağı” (Ph.D. diss., İstanbul Üniversitesi, 1996),
40-45; S. H. Winter, “The Province of Raqqa Under Ottoman Rule, 1535-1800: A Preliminary
48 Ömer Lutfi Barkan devised the most popular formula for calculating the total population from
the taxpaying population recorded in the Ottoman cadasters, proposing a multiplier of five for
each household (hane) and the addition of ten percent to account for tax-exempt bureaucrats and
religious men. See Ömer Lutfi Barkan, “Essai sur les données statistiques des registres de
recensement dans l’Empire ottoman aux XVe et XVIe siècles,” Journal of the Economic and
Social History of the Orient 1, no. 1 (1957): 9-36. For alternative views, see Bekir Kemal
Ataman, “Ottoman Demographic History (14th-17th Centuries): Some Considerations,”
Measurement of Preindustrial Population Changes: The Ottoman Empire from the 15th to the 17th
strengths of each large fortress to improve transportation and tax collection between the Mediterranean and Persian Gulf.

Figure 10. The Largest Riverine Fortresses and their Spheres of Influence

Credit: Faisal Husain, 2018.

Table 2. The Taxpaying Populations of Fortresses along the Tigris and Euphrates

<table>
<thead>
<tr>
<th>Fortress</th>
<th>Year</th>
<th>Number of Taxpayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aleppo</td>
<td>1536</td>
<td>10,079</td>
</tr>
<tr>
<td>Amid (Diyarbakır)</td>
<td>1540</td>
<td>4,225</td>
</tr>
<tr>
<td>Basra</td>
<td>1590</td>
<td>3,849</td>
</tr>
<tr>
<td>Baghdad</td>
<td>1580</td>
<td>3,309</td>
</tr>
<tr>
<td>Mosul</td>
<td>1575</td>
<td>3,184</td>
</tr>
<tr>
<td>Raqqa</td>
<td>1564</td>
<td>74</td>
</tr>
</tbody>
</table>

Note and sources: see Appendix A

A. The Upper Euphrates: Aleppo

Aleppo was to Istanbul what Palmyra was to Rome, the vital link between the Mediterranean Sea and the Euphrates River, Europe and Asia. Istanbul boosted the intermediary role of Aleppo through two types of investments. Seventy miles northeast of the city, it established the Birecik Shipyard, the subject of Chapter 2. In the west, it developed the northern seaports of the Levant (see Figure 11). In Payas at the head of the Gulf of İskenderun, Grand Vizier Sokullu Mehmed Pasha (r. 1565-1579) established in 1574-1575 a large complex comprising a mosque with a convent courtyard, a bathhouse, an elementary school, guestrooms with private courts, a caravanserai with stables, a hospice, and public fountains.49 In the 1590s, in response to the lobbying efforts of European and local merchants, Istanbul ordered the establishment of a customs station in İskenderun, fifteen miles south of Payas.50

Proximity and improved access to the Mediterranean made Aleppo the residence of European consuls and chartered companies. The city’s location at the edge of the Syrian desert at the end of caravan routes, on the other hand, gave it a handy supply of pack animals that travelers could hire or purchase.51 The encounter between European traders from the sea and animal breeders from the desert in the markets of Ottoman Aleppo had far-reaching economic and even biological consequences. Chief among them was the incursion of Arabian bloodstock among the

51 An English army officer in 1778 transcribed the contract he signed with a tribal sheikh to hire nineteen camels from Aleppo. See James Capper, Observations on the Passage to India through Egypt, Also by Vienna through Constantinople to Aleppo, and from Thence by Baghadad, and directly across the Great Desert, to Bassora (London: Printed for W. Faden, J. Robson, and R. Sewell, 1785), 179-183.
equine population of the British Isles, a development that transformed English culture from the early seventeenth century. During the eighteenth century, the tax collector (muhassil) of Aleppo was in charge of managing Ottoman-sponsored traffic between the Mediterranean and the river basin, purveying the necessary horses, camels, mules, geldings, and oxen. From Aleppo to Iraq, the itinerary could follow one of three routes: the direct desert route to Basra, the Euphrates route through Birecik, and the Tigris route through Diyarbakır or Mosul (see Figure 12).

Figure 11. The Seaports of Aleppo

Note: Tripoli was Aleppo’s primary seaport until it was overshadowed by İskenderun, Payas, and Latakia in the late sixteenth century. Credit: Faisal Husain, 2018.

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52 The topic is examined in detail by Donna Landry, Noble Brutes: How Eastern Horses Transformed English Culture (Baltimore: John Hopkins University Press, 2009).

53 BOA, MAD 9912, pp. 382-383 (22 B 1136/16 April 1724); BOA, AE.SAMD.III 51/5150 (27 C 1138/2 March 1726); BOA, AE.SAMD.III 129/12652 (25 § 1139/17 April 1727); BOA, MAD 9934, pp. 56-57 (21 N 1146/25 February 1734); BOA, C.AS 1193/53317 (Evahir M 1148/13-22 June 1735); BOA, MAD 10017, pp. 89-90, 220-221 (10 RA 1191/18 April 1777); BOA, MAD 10017, pp. 90-91 (11 RA 1191/19 April 1777); BOA, C.AS 1157/51478 (26 B 1194/29 July 1780); BOA, AE.SSLM.III 167/10014 (19 RA 1212/11 September 1797).

B. The Upper Tigris: Diyarbakır and Mosul

In Diyarbakır and Mosul, Istanbul had to tailor its transportation projects to the notoriously swift current of the upper Tigris, an attribute that gave the river its name, denoting “sharp” and “arrow” in Old Persian.\textsuperscript{55} It put its money on the \textit{kelek}, a traditional raft made of “bunches of osier twigs, fastened with admirable ingenuity to the stems below” and laid upon “goats skins blowen up ful of wind in maner of bladders” (see Figures 13 and 14).\textsuperscript{56} Three engineering features made the


kelek appeal to imperial officials and travelers alike. First, the kelek could be assembled without “peg, nail, nor indeed, any bit of iron.” Sewn planks supplanted costly and scarce metals and conferred a built-in elasticity in the raft, allowing it to absorb the shocks of hitting rocks and landing on hard shores without breaking up. The kelek’s other strength was its layer of inflated skin that made travel throughout the year possible, even when the Tigris was shallow in certain areas and during the summer. Rowers largely relied on the natural propulsion of the river current and focused on keeping the kelek on its course, away from land, sandbars, and stones. A third engineering feature in the kelek was the ease with which it could be disassembled and recycled, the timber typically sold downstream where it was prized and the skin deflated, dried, and returned upstream for the construction of new rafts. The recycling process is described by Sir Robert Porter in 1818: “When these machines [keleks] reach their place of destination, and the cargo is disposed, all their materials, excepting the skins, are sold; but they, being previously exhausted of their air, are laid on the backs of camels, and return by land with their masters to the port whence they had been embarked.”

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60 In one decree, Istanbul explicitly ordered officials in Diyarbakır to recycle animal skin used in keleks for the construction of new ones. See C.AS 71/3355 (n.d.).
Figure 13. Kelek Construction in Mosul Along the Tigris, c. 1663


Figure 14. A Small Kelek on the Upper Euphrates, 1830

Ottoman interest in the kelek scaled up its production in Diyarbakır and Mosul to an industrial scale. Particularly during the chaotic interregnum between Safavid collapse and the emergence of the Qajar Dynasty in Persia (1722-1785), Istanbul placed recurrent orders for kelek construction in support for its military forces in the east (see Table 3). In charge of fulfilling imperial demands were local contractors called kelekçiyân. Portrayed in several sources as old and poor, kelekçiyân worked in the open air on the banks of the Tigris, where travelers hired them to assemble new rafts or serve as skippers. In support of their service for the state, Istanbul provided them with a constant supply of raw material that they could not muster alone, primarily watertight animal skins (tulum) provisioned from provinces and districts in Syria and eastern Anatolia (Aleppo, Maraş, Ayntab, Malatya, and Süpürgeç). On one occasion in 1734, the imperial administration supplied the kelekçiyân of Diyarbakır with as many as 50,000 skins for the construction of 300 rafts.

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62 BOA, C.ML 753/30679 (2 M 1196/18 December 1781); BOA, C.NF 38/1891 (2 M 1196/18 December 1781); BOA, AE.SİBR 5/560 (c. 1050/1640-1641). According to Evliya Çelebi, Diyarbakır had a bridge on the Tigris called the Kelek Bridge, near which the kelekçiyân assembled rafts. See Evliya Çelebi, Evliya Çelebi Seyahatnamesi, 4:54.

63 BOA, MAD 9934, p. 309 (28 B 1146/4 January 1734). For other orders, see BOA, İE.ML 107/10135 (14 M 1138/21 September 1725); BOA, C.ML 522/21342 (20 CA 1138/24 January 1726); BOA, C.AS 954/41442 (24 CA 1139/17 January 1727); BOA, MAD 9934, pp. 173-174, 177-178 (9 L 1146/15 March 1734); BOA, AE.SMHD.I 85/5750 (Evasit M 1147/13-22 June 1734); BOA, C.ML 221/9191 (21 ZA 1147/6 April 1735).
Table 3. Kelek Production Orders from Istanbul

<table>
<thead>
<tr>
<th>Date</th>
<th>Construction Site</th>
<th>Keleks to be Constructed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1637</td>
<td>Diyarbakır</td>
<td>300</td>
</tr>
<tr>
<td>1733</td>
<td>Diyarbakır and Mosul</td>
<td>200</td>
</tr>
<tr>
<td>1734</td>
<td>Diyarbakır</td>
<td>300</td>
</tr>
<tr>
<td>1746</td>
<td>Diyarbakır</td>
<td>30</td>
</tr>
<tr>
<td>1748</td>
<td>Mosul</td>
<td>22</td>
</tr>
<tr>
<td>1749</td>
<td>Diyarbakır and Mosul</td>
<td>208-582</td>
</tr>
<tr>
<td>1750</td>
<td>Diyarbakır</td>
<td>61-200</td>
</tr>
<tr>
<td>1753</td>
<td>Mosul</td>
<td>190</td>
</tr>
<tr>
<td>1775</td>
<td>Diyarbakır</td>
<td>125</td>
</tr>
<tr>
<td>1780</td>
<td>Mosul</td>
<td>303</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

The reinvigoration of the kelek industry had social consequences. Under the insistent pressure of Ottoman demands for their services in the eighteenth century, the kelekçiyân banded together, strengthened their pre-existing ties, and set up their own guilds, referred to as the esnafi kelekçiyân. As late as 1726, Ottoman documents referred to the kelekçiyân either as such or as taife, a generic term for a group of people.64 The signs of formal organization and internal hierarchical structure among the kelekçiyân become unmistakably visible by 1748, when the headman of the kelekçiyân guild (kelekçiyân şeyhi) in Mosul appeared before the city’s Islamic court to confirm payments made by the state for kelek construction.65 The document indicates that, no later than the 1740s, the kelekçiyân of Mosul and Diyarbakır had appointed chiefs recognized by the state who could represent and defend their interests in court.66 A cohesive artisan

64 BOA, İE.ML 107/10135 (14 M 1138/21 September 1725); BOA, C.AS 786/33308 (8 S 1139/4 October 1726).
65 BOA, D.BŞM.MSH 8/1 (1 ZA 1161/24 October 1748). The kelekçiyân guild headman is named Othman ibn al-Haj Murad and appeared in court in a similar capacity five years later. See BOA, D.BŞM.MSH 8/33 (Evail RA 1166/6-15 January 1753).
organization allowed the kelekçiyân to respond to the increasing need for their services more efficiently, working in well-known locations along the Tigris by rotation (münavebe). In addition to fostering internal cohesion, the kelekçiyân guild established rapport with other urban artisans, notably the felt makers’ (keçeciler) and butchers’ (kasap) guilds, who supplied the kelekçiyân with the raw material (felt and animal skin) needed for kelek construction.

In search for new sources of revenue in the late eighteenth century, the state offered the position of the kelekçiyân guild headman for sale, garnering 4,000 and 5,000 guruş (a large Ottoman silver coin) in Mosul and Diyarbakır every year, respectively. Aside from opening the door for abuse by profiteers who did not have the interest of artisans at heart, selling the office of the guild headman effectively transformed the kelekçiyân guilds into an extension of the provincial administration. Official status and state recognition granted artisans easy access to customers and suppliers from other Ottoman districts, not to mention the imperial capital, and increased the capacity of the kelek construction industry in the upper Tigris, reinforcing the position of Diyarbakır and Mosul as two of the busiest transportation hubs in the drainage basin.

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67 BOA, C.ML 753/30679 (2 M 1196/18 December 1781); BOA, C.NF 38/1891 (2 M 1196/18 December 1781).
68 BOA, D.BŞM.MSH 8/33 (Evail RA 1166/6-15 January 1753); BOA, C.BLD 16/777 (5 RA 1223/1 May 1808).
69 For a complaint by the kelekçiyân against an outsider who purchased the position of guild headman and abused them, see BOA, C.ML 753/30679 (2 M 1196/18 December 1781); BOA, C.NF 38/1891 (2 M 1196/18 December 1781). The formation of the kelekçiyân guilds and the sale of their offices reflected broader processes within the Ottoman Empire between the seventeenth and eighteenth centuries, a period when artisan and shopkeeper guilds became widespread, particularly in large cities. A comprehensive account on the subject is provided by Suraiya Faroqhi, Artisans of Empire: Crafts and Craftspeople Under the Ottomans (New York: I.B.Tauris, 2009).
C. The Lower Tigris and Euphrates: Baghdad and Basra

To control water and land communications in the lower basin, Istanbul poured its resources into Baghdad and Basra. Both fortresses, founded in the seventh and eighth centuries, appealed to imperial authorities due to their propitious location, which ensured that they would not suffer the fate of many other ephemeral cities established by the early empires of Islam, only to be abandoned and left in ruins. A report penned by the British East India Company resident Samuel Manesty and his assistant Harford Jones in 1790 summarized the advantages Basra enjoyed on the Shatt al-Arab at the crossroads of three water bodies—the Tigris, Euphrates, and Persian Gulf. “Bussora is situated on the Banks of a Noble River,” they wrote, “capable of admitting into it Vessels of the burthen of five hundred Tons, and peculiarly easy of Navigation. It has a free communication with Shuster by the Kaffar and Caroon Rivers, with Bagdad by the Rivers Tygris and Euphrates[,] with Aleppo, by the Desert, and through those Channels with the Northern Parts of Persia, Coordistan, Armenia, Georgia, Notalia, Syria and Europe, and the Sea opens to it, a Commercial Intercourse with India.”70 Particularly when political conditions were stable, Basra exerted a strong magnetic pull on wealthy merchants from all over the world, drawn to the economic opportunities the city provided. In the eyes of the Portuguese geographer António Bocarro in 1634, the continuous circulation of specie in gold and silver and of luxury goods from India and Europe seemed to spoil men in the city, whom he derided as “very fat, white, weak and cowardly… and much addicted to sodomy despite the unusual beauty of their women.”71

Likewise, Baghdad’s location near the point where the Tigris and Euphrates come closest together, separated by a mere twenty-five miles of land (compared to some 200 miles that separate the rivers in northern Iraq and Syria), granted provincial officials easy access to and control over the major travel routes in Iraq (see Figure 15). The Abbasid ruler Abu Jaʿfar al-Mansur (d. 775) explicitly invoked the strategic setting when he ordered the construction of the city in 762, reportedly claiming: “Here is the Tigris with nothing between us and China, so everything which comes by sea can reach us by the river, as can the provisions from the Jazira, Armenia and the surrounding areas. And there is the Euphrates on which everything from Syria, Raqqa and the surrounding areas may come.” According to Porter in 1818, the ability of Baghdad to bounce back after every crushing blow was a testament to its location. “Massacre, devastation, and oppression have ransacked this city during several hundred years,” he wrote, “and yet it bears a name, and a certain respectability in the East, solely from the circumstance of its situation being a central depot; or rather, with more propriety, we might call it ‘the still important great caravansary of Asia;’ from its lying on the main road of traffic between so many distant countries, to receive, and protect, and set forward on their business, all the merchants and merchandise which pass to and fro, from Indus to the Nile, Or Caspian wave, and Oman’s rocky shore.”

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73 Porter, *Travels in Georgia*, 2:265. Along the same lines, a British commercial consul described Baghdad in 1774 as “the grand mart for the produce of India and Persia, Constantinople, Aleppo, and Damascus” and “the grand oriental depository.” Abraham Parsons, *Travels in Asia and Africa* (London: Longman, Hurst, Rees, and Orme, 1808), 127.
Istanbul cashed in on the centrality of Baghdad and Basra to the lower river basin’s route systems through a network of docks and bridges that served as police stations and toll booths (see Figure 16). Before his departure from Baghdad in March 1535, Süleyman I personally ordered that officials do everything necessary to secure the river crossings, a task that later administrations regarded as one of the primary responsibilities of provincial governors.74 The pontoon bridge of

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74 Matrakçı Nasuh, “Beyan-ı Menazil-i Sefer-i Irakeyn,” İstanbul Üniversitesi Nadir Eserler Kütüphanesi MSS T.5964, fol. 61a; BOA, MD 12, no. 146, p. 66 (12 L 978/9 March 1571); BOA, MD 12, no. 152, p. 69 (12 L 978/9 March 1571). The published version of Mühimme Defteri 12 and several others are listed in the Bibliography.
Baghdad formed the central river crossing in Iraq. Depending on the season and water level, it comprised of anywhere between twenty-eight and forty-five boats stretching over a river channel that was, by a rough German estimate in 1574, “as broad, as the Rhine is at Strasburg.” Heavy iron chains extended from two large anchors buried in the sand on each bank to tie and fasten the boats together. When rafts and vessels had to pass down or up the river, traffic police called köprücüler temporarily stopped pedestrian movement to open the bridge for passage, unmooring three to six boats in the middle. The köprücüler collected different tolls on vessels and pack animals outlined at length in the law code of Baghdad in 1580. Toll rates frequently changed between the sixteenth and eighteenth centuries but were always calculated based on cargo items and their mode of transportation. For travelers, the Baghdad bridge was a safe and convenient river crossing; for the provincial administration, it was a site of control and a source of revenue; for ordinary people, it was an attraction site where diving competitions took place and coffee houses and Sufi convents proliferated.

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75 For a historical background on bridges in Baghdad, see Guy Le Strange, Baghdad during the Abbasid Caliphate from Contemporary Arabic and Persian Sources (Oxford: Oxford University Press, 1900), 177-186.
77 TKG.KK, TT 29, fol. 4a.
78 Parsons, Travels in Asia and Africa, 119.
79 Evliya Çelebi, Evliya Çelebi Seyahatnamesi, 4:255-256.
On the Euphrates, city officials maintained several docks smaller than the one in Baghdad (Figure 16). For vessels descending to Iraq, Falluja, a small town of 227 taxpayers in 1580, was the most important transit point during the sixteenth and early seventeenth centuries. It was the landing place of a London merchant in 1581, where, he wrote, “I was searched for money, and the Searcher found all that I had.” Once cleared, he met an officer on his way to Baghdad, who received and accompanied him to his destination. During the second half of the seventeenth century, a nearby dock in Ridwaniyya came to replace Falluja as Baghdad’s outlet to the upper

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80 TKG.KK, TT 29, ff. 40b-42a.
81 John Newberie, “Two Voyages of Master John Newberie, One into the Holy Land; The Other to Balsara, Ormus, Persia, and Backe Thorow Turkie,” in *Hakluytus Posthumus; or, Purchas His Pilgrimes: Contayning a History of the World in Sea Voyages and Lande Travells by Englishmen and Others*, ed. Samuel Purchas (Glasgow: James MacLehose and Sons, 1905), 8:454.
Euphrates. Reaching Falluja and Ridwaniyya was unfeasible for vessels ascending from Basra. A more convenient dock to them was the city of Hilla, the largest Ottoman fortress on the Euphrates and home to some 5,300 taxpayers, nearly 27,000 people, in 1580 (Figure 17).\footnote{TKG.KK, TT 29, ff. 218a-265a; Parsons, \textit{Travels in Asia and Africa}, 120.}

Figure 17. View of Hilla on the Euphrates, c. 1818


In Basra, Ottoman officials in the second half of the sixteenth century maintained and collected tolls from no less than seven docks within the city itself and along the Shatt al-Arab and the lower Tigris and Euphrates (see Figure 16 and Table 4). The dock at Qurna stood out due to its strategic location at the confluence of the Tigris and Euphrates, well-garrisoned by Ottoman troops and defended by galleys and cannon. A French traveler in 1652 described his experienced passing through customs in Qurna: “And here it is that the Account of the Customs is taken. But though they are very exact in searching the Barks, they are very civil, for they search no body. However left any Goods should be hid between the Planks of the Ships, over which they generally
throw Fagots and Canes, the Customers bring a great Piercer, with which they bore the sides of
the Bark quite thorugh for the discovery of conce’d Goods. The Goods are Register’d at Gorno
[Qurna], but the Customs are always paid at Balsara [Basra], according to the accompl giv’n from
the Fort.”

Table 4. Docks in the Basra Province, 1550-1590

<table>
<thead>
<tr>
<th>Dock Name</th>
<th>Region</th>
<th>Year</th>
<th>Tolls Collected (akçe)</th>
<th>Percentage of Total Basra Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shatt al-Arab</td>
<td>Shatt al-Arab</td>
<td>1552</td>
<td>8,573</td>
<td>0.10%</td>
</tr>
<tr>
<td>Basra</td>
<td>Basra City</td>
<td>1552</td>
<td>1,394,799</td>
<td>17%</td>
</tr>
<tr>
<td>Qurna</td>
<td>Tigris-Euphrates Confluence</td>
<td>1552</td>
<td>120,000</td>
<td>1.5%</td>
</tr>
<tr>
<td>Sedr Süveyyib</td>
<td>Shatt al-Arab</td>
<td>1552</td>
<td>60,000</td>
<td>0.75%</td>
</tr>
<tr>
<td>Zakiyya</td>
<td>Lower Tigris</td>
<td>1552</td>
<td>160,000</td>
<td>2%</td>
</tr>
<tr>
<td>Hammar</td>
<td>Lower Euphrates</td>
<td>1590</td>
<td>Not reported</td>
<td>-</td>
</tr>
<tr>
<td>‘Arja</td>
<td>Lower Euphrates</td>
<td>1590</td>
<td>100,000</td>
<td>0.70%</td>
</tr>
</tbody>
</table>

Note and sources: see Appendix A

To recapitulate, following the Ottoman unification of the Tigris and Euphrates, the largest
fortresses along the rivers—Aleppo, Diyarbakır, Mosul, Baghdad, and Basra—received
considerable financial and logistical support from Istanbul to improve their communication
infrastructure. Imperial investment took different shapes and forms depending on the potential of
each fortress. As a result, new seaports on the Mediterranean and a shipyard on the Euphrates came
to flank Aleppo, the capacity of the kelek industry in Diyarbakır and Mosul boomed, and docks
and bridges in Baghdad and Basra created choke points to capture, and make the most of, increased

traffic. Together, these transportation facilities and arrangements resuscitated the river basin’s access to the Mediterranean after centuries of relative isolation. For nearly three centuries, the Tigris and Euphrates experienced a slump in traffic as the Mongol-Mamluk conflict and the flourishing of new Ilkhanid and Seljuk centers of power in the north drove a wedge between Iraq and the world around it. Most east-west trade bypassed the lower river valley in favor of a northern route through Anatolia and Persia and a southern route through Egypt and the Red Sea. The regional communication network devised by Istanbul in the sixteenth century revived the status of the Tigris and Euphrates as two of the greatest thoroughfares in Eurasia.

**Flows**

Unable to secure it promptly from British merchants in 1797, the governor of Baghdad Süleyman Pasha (r. 1780-1802) asked the imperial administration to replenish his stock of gunpowder. The request circulated among different state departments searching their records for how similar deliveries were organized in the past to such a distant province. Their findings were breathtaking. The customs official in Istanbul (*gümrük emini*), the report outlined, is responsible for finding, loading, and dispatching a ship to the port of İskenderun; the customs official in İskenderun would transport the cargo by camels to Aleppo; camels hired by the Aleppo tax collector would take up the cargo to Diyarbakır; the military agent of Diyarbakır (*voyvoda*) would dispatch the shipment down the Tigris by rafts; in Baghdad, deputy of the head of armorers (*cebecibaşi vekili*) would be waiting to receive the rafts. Ahead of time, Istanbul would issue a letter addressed to each

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provincial official and his superior to notify them of the impending shipping request. The remarkable sketch drawn in the document reveals the broad outlines of a robust communication system that had kept Iraq within the Ottoman imperial orbit between the sixteenth and eighteenth centuries.

Each part of the journey between Istanbul and Iraq, by the sea, desert, and rivers, had its own challenges. When routing traffic along the Tigris and Euphrates, in particular, Istanbul had to come to terms with three features in the natural environment. First, the Tigris occupies a more entrenched channel at a significantly lower altitude than the Euphrates. The Tigris current, as a result, was more swift and navigable throughout the year, but unsafe during the spring. Instances of keleks capsizing in the turbulent waters discouraged Ottoman authorities from using water transport between March and June, occasionally relying on draft animals instead. The Euphrates posed the opposite problem. Its elevated bed and shallow waters exposed vessels to the constant threat of crashing into sandbars and stones, particularly during the summer. Calmer and easier to manipulate for irrigation purposes, the Euphrates contained more weirs and dams that added to the number of impediments to navigation. Provincial authorities had to adjust to the Euphrates channel by dispatching most shipments in the winter and spring and building boats with shallow hulls that resembled those of a Viking ship.

85 BOA, C.AS 903/38901 (25 Ş 1211/22 February 1797).
86 BOA, C.AS 572/24061 (9 L 1155/7 December 1742); BOA, D.BŞM.BGH 2/47 (24 L 1161/17 October 1748); BOA, C.AS 1146/50952 (28 CA 1180/1 November 1766).
87 BOA, AE.SAMD.III 33/3140 (17 L 1139/7 June 1727); BOA, MD 111, no. 1308, p. 381 (Evast S 1112/28 July-6 August 1700); BOA, HAT 373/20404A (3 ZA 1252/9 February 1837).
88 BOA, C.BH 90/4305 (18 CA 1112/31 October 1700).
89 BOA, MD 30, no. 675, p. 292 (29 S 985/18 May 1577); BOA, MD 34, no. 270, p. 124 (13 S 986/21 April 1578); BOA, MAD 9885, p. 323 (22 ZA 1111/12 May 1700); BOA, MAD 9885, p. 354 (3 Z 1111/23 May 1700); BOA, MAD 2775, p. 324 (29 Safar 973/24 September 1565); BOA, MAD 7915, p. 268 (11 B 1111/2 January 1700); BOA, MAD 7915, p. 272 (n.d.); BOA, C.BH 90/4305 (18 CA 1112/31 October 1700); BOA, C.AS 1206/54035 (22 ZA 1197/19
The second physical feature that had to be taken into account was the Tigris-Euphrates flow from north to south. A southerly flow rendered upstream navigation nearly impossible beyond Baghdad on the Tigris and Hilla on the Euphrates and difficult anywhere below both points, typically requiring a grueling combination of rowing and towing by a long rope from the banks against prevailing winds and current (see Figure 18).\(^9^0\) By one estimate, the same distance crossed in four days down the lower Euphrates in November took as long as a month to traverse from the opposite direction.\(^9^1\) The trip could be twice as difficult and lengthy on the Tigris or in the spring.

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\(^9^0\) Like rowing, towing vessels, or tracking, tended to employ people from the bottom of the social order and subjected them to a great deal of hardship. A British traveler in 1758 described his encounter with Ottoman officers beating exhausted trackers with a large stick. See Edward Ives, *A Voyage from England to India, in the Year 1754, and an Historical Narrative of the Operations of the Squadron and Army in India, under the Command of Vice-Admiral Watson and Colonel Clive, in the Years 1755, 1756, 1757; including a Correspondence between the Admiral and the Nabob Serajah Dowlah* (London: Printed for Edward and Charles Dilly, 1773), 256.

\(^9^1\) Parsons, *Travels in Asia and Africa*, 145.
Lastly, compared to the catchment area in Anatolia, the southern alluvial plain had a limited range of natural resources. In terms of cereal crops, an Ottoman report in 1749 explicitly noted that “the state’s agricultural produce in the districts of the Baghdad province is insufficient.”92 The report is confirmed by European observers such as Harford Jones in 1800, then resident of the East India Company in Baghdad, who wrote that “the Country from Baghdad to Bussora does not produce Wheat and Barley enough for its own consumption.”93 In the unvarnished language of the Italian traveler Pietro della Valle (d. 1652) some 150 years earlier, “Bassora hath not sufficient Victuals.”94 The experience of grain shortage in the region, once the breadbasket and tax base of

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93 “Correspondence, mainly of Sir Harford Jones, with 1st and 2nd Viscounts Melville: 1785-1820,” British Library, Add. MS 41767, ff. 81a-84a (7 October 1800), quotation from fol. 82b.
94 Pietro della Valle, The Travels of Sig. Pietro della Valle, A Noble Roman, into East-India and Arabia Deserta, In Which, the Several Countries, Together with the Customs, Manners,
several Near Eastern powers, was relatively recent and could be traced to the deterioration of the Sasanian irrigation system from the ninth century.\textsuperscript{95} The lack of ore deposits was a more longstanding problem that Mesopotamian states had long struggled to deal with by importing metals from outside.\textsuperscript{96} In the early modern age of gunpowder and standing armies, Iraq’s deficit in ore and grain made it ever more dependent on northern neighbors that enjoyed a surplus in both.

Istanbul tailored water communication in the drainage basin to overcome and take advantage of these prominent features in the physical environment—the channel gradients, the direction of flow, and the resource disparities between north and south. The biggest beneficiary of the transportation system that emerged was Iraq, the region most in need for imports and most easily accessible by both the Tigris and Euphrates from both directions, downstream and upstream. Under the auspices of the imperial center, the twin rivers granted Iraq reliable access to what Swedish food scientist Georg Borgström once called “ghost acreage,” the produce of tilled lands


beyond a country’s borders necessary to feed itself. Regular shipments of Anatolian grain, either raw or cooked as hardtack (*peksimet*), kept Ottoman garrisons between Baghdad and Basra nutritionally afloat. On rare occasions, such as 1579, grain reached Baghdad from as far as Egypt (see Table 5). Fortresses along the metal-poor alluvial plain, moreover, received through the Tigris and Euphrates regular deliveries of guns, mortars, shells, and cannonballs cast out of iron, bronze, copper, and lead at the Imperial Cannon Foundry (*Tophane-i Amire*) and Imperial Armory (*Cebehane-i Amire*) in Istanbul (see Figure 19). Along with guns came gunpowder produced in the mills (*baruthane*) of Istanbul, Thessaloniki, and Gallipoli (see Table 6).  

![Figure 19. War Industry Plants in Istanbul](image_url)


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<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Destination</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1565</td>
<td>Diyarbakır</td>
<td>Baghdad</td>
<td>4,000 mud wheat and barley</td>
</tr>
<tr>
<td>1566</td>
<td>Birecik</td>
<td>Baghdad and Basra</td>
<td>150,000 mile barley + 50,000 mile wheat</td>
</tr>
<tr>
<td>1567</td>
<td>Diyarbakır, Nusaybin, and Hasankeyf</td>
<td>Baghdad</td>
<td>31,472 mile wheat + 39,929 mile barley</td>
</tr>
<tr>
<td>1579</td>
<td>Egypt</td>
<td>Baghdad</td>
<td>25,000 erdeb wheat + 20,000 erdeb barley</td>
</tr>
<tr>
<td>1639</td>
<td>Birecik, Ayntab, and Aleppo</td>
<td>Baghdad</td>
<td>35,480 keyl wheat</td>
</tr>
<tr>
<td>1699</td>
<td>Birecik, Diyarbakır, Mosul, Nusaybin, Mardin, Raqqa, and Maraş</td>
<td>Baghdad</td>
<td>60,000 mile wheat + 11,412 mile barley</td>
</tr>
<tr>
<td>1700</td>
<td>Diyarbakır and Raqqa</td>
<td>Baghdad</td>
<td>90,000 mile wheat</td>
</tr>
<tr>
<td>1701</td>
<td>Birecik, Diyarbakır, Mosul, Nusaybin, Mardin, and Maraş</td>
<td>Baghdad</td>
<td>150,000 mile wheat + 10,000 mile barley</td>
</tr>
<tr>
<td>1702</td>
<td>Mosul</td>
<td>Basra</td>
<td>6,090 qintar hardtack</td>
</tr>
<tr>
<td>1708</td>
<td>Diyarbakır</td>
<td>Basra</td>
<td>2,011 qintar hardtack</td>
</tr>
<tr>
<td>1726</td>
<td>Mardin and Diyarbakır</td>
<td>Baghdad</td>
<td>60,000 mile wheat and barley + 40,000 mile wheat + 50,000 mile barley</td>
</tr>
<tr>
<td>1727</td>
<td>Ayntab, Samsat, Süpürek</td>
<td>Mosul and Baghdad</td>
<td>113,000 mile wheat + 116,000 mile barley</td>
</tr>
<tr>
<td>1733</td>
<td>Diyarbakır, Mardin, Raqqa, and Mosul</td>
<td>Baghdad</td>
<td>100,000 mile wheat and barley</td>
</tr>
<tr>
<td>1742</td>
<td>Mosul and Mardin</td>
<td>Baghdad</td>
<td>68,819.5 mile wheat + 46,256.5 mile barley</td>
</tr>
<tr>
<td>1744</td>
<td>Aleppo</td>
<td>Baghdad</td>
<td>Not reported</td>
</tr>
<tr>
<td>1745</td>
<td>Raqqa</td>
<td>Baghdad</td>
<td>9,928 mile wheat</td>
</tr>
<tr>
<td>1748</td>
<td>Mosul</td>
<td>Baghdad</td>
<td>5,280 mile wheat</td>
</tr>
<tr>
<td>1749-1750</td>
<td>Diyarbakır, Mosul, Mardin, and Nusaybin</td>
<td>Baghdad</td>
<td>200,000 mile wheat + 200,000 mile barley</td>
</tr>
<tr>
<td>1751</td>
<td>Diyarbakır and Mosul</td>
<td>Baghdad</td>
<td>55,472 mile wheat + 55,472 mile barley</td>
</tr>
<tr>
<td>1753</td>
<td>Mosul</td>
<td>Baghdad</td>
<td>40,000 mile wheat</td>
</tr>
<tr>
<td>1758</td>
<td>Diyarbakır and Mosul</td>
<td>Baghdad</td>
<td>Not reported</td>
</tr>
<tr>
<td>1777</td>
<td>Istanbul, Mosul, Imadiyya, Malatya, Aleppo, Raqqa, Süpürek, Birecik, and Samsat</td>
<td>Baghdad</td>
<td>150,000 mile wheat + 100,000 mile barley</td>
</tr>
<tr>
<td>1780</td>
<td>Mosul</td>
<td>Baghdad</td>
<td>66,550 mile wheat + 56,216 mile barley</td>
</tr>
</tbody>
</table>

Sources: see Appendix A
<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Destination</th>
<th>Shipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1552</td>
<td>Diyarbakır</td>
<td>Baghdad</td>
<td>Arquebuses (tıfeng): 500 pieces</td>
</tr>
<tr>
<td>1565</td>
<td>Imperial Armory, Istanbul <em>(Cebehane-i Amire)</em></td>
<td>Baghdad</td>
<td>Arquebuses <em>(tıfeng)</em>: 1,000-1,500 pieces</td>
</tr>
<tr>
<td>1565</td>
<td>Birecik and Aleppo</td>
<td>Basra</td>
<td>Lead <em>(kursun)</em>: 450 qintar, Iron <em>(demir)</em>: 400 qintar</td>
</tr>
<tr>
<td>1566</td>
<td>Imperial Cannon Foundry, Istanbul <em>(Tophane-i Amire)</em></td>
<td>Basra</td>
<td>Kokumburina guns: 20 pieces, Darbzen guns: 5 pieces, Guns <em>(topu)</em>: 4 pieces</td>
</tr>
<tr>
<td>1568</td>
<td>Aleppo</td>
<td>Lahsa, via Basra</td>
<td>Arquebuse stocks <em>(tıfeng kundağı)</em>: 1,000, Cart axles <em>(araba iği)</em>: 40</td>
</tr>
<tr>
<td>1571-1572</td>
<td>Baghdad and Basra</td>
<td>Lahsa</td>
<td>Gunpowder <em>(barut-i siyah)</em>: 300 qintar, Shahi Darbzen guns: 4 pieces, Gunners <em>(topu)</em>: 20 persons</td>
</tr>
<tr>
<td>1700</td>
<td>Imperial Cannon Foundry, Istanbul <em>(Tophane-i Amire)</em></td>
<td>Shatt al-Arab Squadron</td>
<td>Koğuş guns: 60 pieces, Koğuş stocks <em>(koğuş kundağı)</em>: 60 pieces, Flanking guns <em>(yan topu)</em>: 120 pieces, Mortars <em>(havan topu)</em>: 4 pieces, Mortar stocks <em>(havan kundağı)</em>: 4 pieces, Saçma guns: 18 pieces, Cast-iron saçma guns <em>(demir saçma)</em>: 230, Eynek guns: 24 pieces, Cast-iron eynek guns <em>(demir eynek)</em>: 472, Bombshells <em>(humbara danesi)</em>: 552, Cannonball <em>(yuvarlık)</em>: 18,000</td>
</tr>
<tr>
<td>1700</td>
<td>Imperial Armory, Istanbul <em>(Cebehane-i Amire)</em></td>
<td>Baghdad</td>
<td>Gunpowder <em>(barut)</em>: 450 qintar</td>
</tr>
<tr>
<td>1703</td>
<td>Diyarbakır and Mosul</td>
<td>Basra</td>
<td>Galleon guns <em>(kalyun topu)</em>: unspecified number</td>
</tr>
<tr>
<td>1724</td>
<td>Istanbul</td>
<td>Baghdad</td>
<td>Unspecific quantities of gunpowder <em>(barut)</em>, lead <em>(kursun)</em>, cannonball <em>(yuvarlık)</em>, and bombshell <em>(humbara danesi)</em></td>
</tr>
<tr>
<td>1726</td>
<td>Imperial Armory, Istanbul <em>(Cebehane-i Amire)</em></td>
<td>Qurna and Basra</td>
<td>Gunpowder <em>(barut-i siyah)</em>: 2,400 qintar</td>
</tr>
<tr>
<td>1733</td>
<td>Istanbul</td>
<td>Mosul</td>
<td>Shahi guns: 50 pieces</td>
</tr>
<tr>
<td>1743</td>
<td>Istanbul</td>
<td>Diyarbakır</td>
<td>Mortars <em>(havan)</em>: 5 pieces</td>
</tr>
<tr>
<td>1750</td>
<td>Mosul</td>
<td>Baghdad</td>
<td>Unfinished stocks <em>(kundak)</em>: 11 pieces</td>
</tr>
<tr>
<td>Year</td>
<td>Location 1</td>
<td>Location 2</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1759</td>
<td>Istanbul</td>
<td>Baghdad</td>
<td>Artillery ordinance (muhimmat-i tophane)</td>
</tr>
<tr>
<td>1762</td>
<td>Istanbul</td>
<td>Baghdad</td>
<td>Artillery ordinance and ammunitions (muhimmat-i cebehane ve tophane)</td>
</tr>
</tbody>
</table>
| 1766-67 | Imperial Armory, Istanbul (Cebehane-i Amire) and Thessaloniki Gunpowder Works (Selanik Baruthanesi) | Baghdad | Gunpowder (barut-i siyah): 500-1,000 qintar  
Lead (kurşun): 300-1,000 qintar  
Bombshell fuses (tapa-i humbara): 5,000 pieces  
Hewn cypress (teraş selvi): 50 pieces  
Hewn pine (teraş çam): 50 pieces  
Bombardier master (ustad humbaraci): 2 persons  
Artillery master (ustad topçu): 5 persons  
Carpenters: 4 persons  
Caulkers: 4 persons |
| 1775 | Imperial Gunpowder Works, Istanbul (Baruthane-i Amire) | Baghdad | Gunpowder (barut-i siyah): 1,000 qintar  
Lead (kurşun): 400 qintar |
| 1779 | Diyarbakir Armory (cebehane) | Basra | Gunpowder (barut-i siyah): 250 qintar  
Lead (kurşun): 120 qintar  
Egyptian matchlock (fetil-i masri): 8 qintar  
Saber (kılıç): 400 pieces  
Arquebuses (tişfung): 400 pieces  
Pickaxe (kazma): 2,500 pieces |
| 1781 | Gallipoli Gunpowder Works | Baghdad and Basra | Gunpowder (barut-i siyah): 700 qintar |
| 1783 | Istanbul | Baghdad | Artillery stocks (top kundağı): 60 pieces |
| 1797 | Istanbul | Baghdad | Gunpowder (barut-i siyah): 500 qintar |

Sources: see Appendix A

Thus, water flowing in the Tigris and Euphrates smoothed the way for Istanbul’s grain and gun shipments along the eastern frontier, with which it sustained sizable and heavily-armed garrisons and kept Baghdad and Basra under its imperial fold. The natural and political considerations that gave rise to the Ottoman system of river transport in the sixteenth century would begin to unravel by the late eighteenth century, when the Iraqi provinces began to rely
increasingly on arms imports from the British East India Company and later on steamboats that obliterated the millennia-old constraints on rowboats and sailing boats. The unraveling of the early modern communication system explains why the Istanbul bureaucracy had to refresh its memory for a response when Baghdad’s governor Süleyman Pasha placed the request for gunpowder in 1797, which by then was becoming an increasingly rare occurrence.

**Intelligent Control**

The Ottoman system of water communication impacted the northern and southern ends of both rivers differently. In Anatolia, it drove environmental change by adding pressure on livestock for their skins and on fields for their harvests. In Iraq, the influx of grain and guns transformed Ottoman fortresses into focal centers for organized violence, exercising the powers of life and death over their hinterlands. As armed confrontations with Safavid Persia broke out throughout the sixteenth and early seventeenth centuries, fortresses along the Tigris, in particular, became highly militarized and home to the largest Ottoman garrisons in the southeastern frontier.

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them, military personnel and hardware flowed to smaller outposts. The Ottoman regiment in Kirkuk near the foot of the Zagros Mountains, for example, relied heavily on support from Mosul and, to a lesser extent, Diyarbakır and Baghdad.\textsuperscript{101} Samawa in the lower Euphrates relied on Baghdad, whose janissaries served in the small town by rotation.\textsuperscript{102} At the confluence of the Tigris and Euphrates, Qurna was a military dependency of Basra (see Tables 7, 8, and 9).

Table 7. The Janissary Corps in Kirkuk

<table>
<thead>
<tr>
<th>Year</th>
<th>Regiment Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1664</td>
<td>176</td>
</tr>
<tr>
<td>1687</td>
<td>241</td>
</tr>
<tr>
<td>1694</td>
<td>215</td>
</tr>
<tr>
<td>1704</td>
<td>229</td>
</tr>
<tr>
<td>1705</td>
<td>133</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Table 8. The Janissary Corps in Basra

<table>
<thead>
<tr>
<th>Year</th>
<th>Regiment Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1670</td>
<td>1,500</td>
</tr>
<tr>
<td>1671</td>
<td>1,212</td>
</tr>
<tr>
<td>1682</td>
<td>226</td>
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<tr>
<td>1687</td>
<td>156</td>
</tr>
<tr>
<td>1690</td>
<td>155</td>
</tr>
<tr>
<td>1711</td>
<td>357</td>
</tr>
<tr>
<td>1712</td>
<td>350</td>
</tr>
<tr>
<td>1714</td>
<td>374</td>
</tr>
<tr>
<td>1729-1730</td>
<td>380</td>
</tr>
<tr>
<td>1738</td>
<td>319</td>
</tr>
<tr>
<td>1739</td>
<td>319</td>
</tr>
<tr>
<td>1741</td>
<td>319</td>
</tr>
<tr>
<td>1742</td>
<td>319</td>
</tr>
<tr>
<td>1743</td>
<td>480</td>
</tr>
<tr>
<td>1746</td>
<td>364</td>
</tr>
</tbody>
</table>

\textsuperscript{101} For Mosul’s support of the janissary regiment in Kirkuk, see Table 7. For Diyarbakır’s and Baghdad’s support, see BOA, MD 5, no. 1133, p. 426 (16 $\mathcal{Y}$ 973/8 March 1566); BOA, İE.AS 54/4873 (4 ZA 1118/7 February 1707).

\textsuperscript{102} BOA, MD 6, no. 1418, p. 645 (18 Z 972/16 July 1565).
Table 9. The Janissary Corps in Qurna

<table>
<thead>
<tr>
<th>Year</th>
<th>Regiment Size</th>
</tr>
</thead>
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<tr>
<td>1771</td>
<td>79-82</td>
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</table>

Sources: see Appendix A

Among its peers upstream and downstream, the Baghdad fortress stood as the most ominous display of Ottoman military might. The Tigris on the west and walls behind a moat on
the east enclosed the city within an irregular pentagon dominated by ten towers (kule), each equipped with six to seven pieces of artillery (see Figure 20). On the towers, behind the four gates, and in the citadel (iç kale), Baghdad had in the middle of the seventeenth century, by Evliya Çelebi’s count, 1,060 artillery pieces of different types and sizes, the likes of which he had rarely seen anywhere in the empire. Day and night, soldiers with smaller firearms manned thousands of crenels (beden) spaced between the towers. Those unfortunate enough to be discovered by their superiors napping at the crenels during their night shifts were reprimanded with 100 blows from a stick. The walls were hardy, made of polished mud brick (mucella tuğ), white stone (beyaz taş), and lime (kireç) and reinforced from inside by arches (kemer). During his stay in Baghdad between December 1638 and February 1639, Murad IV (r. 1623-1640) conducted a trial to test the strength of the wall by ordering his troops to open fire at it with cannon. The cannonball pierced the wall without knocking it down, an outcome Evliya Çelebi recounted to demonstrate Baghdad’s impressive means of defense. Had the wall been built out of stone, he reasoned, it could have easily crumbled. To European observers, the Ottoman fortifications of Baghdad needed no better vindication than the fact that Nadir Shah (d. 1747), the conqueror of Delhi “whose name shook the east,” tried to conquer the city twice to no avail.

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104 Evliya Çelebi, *Evliya Çelebi Seyahatnamesi*, 4:249. The only places were Çelebi found artillery similar to Baghdad’s were Istanbul, Buda, the Black Sea, Boğazhisar, and the Rhodes.


In terms of personnel, the imperial administration maintained in the city a regular janissary corps (*yeniçeriyan*) equipped with handguns and reinforced it with an artillery corps comprised of artillerymen (*topçuyan*), artillery carriage drivers (*top arabacıyan*), and armorers (*cebeciyan*). In the middle of the seventeenth century, their ranks included some Ottoman Christian subjects who found in Baghdad an escape from fighting their co-religionists on the European front. One of them was the city’s celebrated artillery commander (*topçubaşı*) “Signor Michaël,” a Greek miner from Heraklion (Candia) who lived in Damascus and visited Baghdad every year to inspect the
cannon. Together, the janissary and artillery corps stationed in Baghdad ranged between 1,000 and 10,000 men according to the rhythm of military activity in the east (see Table 10). Occasionally, Istanbul deployed additional troops from other provinces and even from foreign countries, including 500 French gunners who were serving in Baghdad during Evliya Çelebi’s visit in 1656. A more renowned unit called up from outside was the provincial military band (mehterhane), whose members were drawn from Egypt. Every day after the nightfall prayer and occasionally in enthronement celebrations, royal births, and conquests, the band performed on a giant kettle-drum known throughout Anatolia and Persia as Baghdad Köşü. Troops recruited by the imperial center fought alongside numerous other local forces and tribesmen (yerlü neferat) who in many cases were far greater in number.

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111 Infrequently, the sources mention the presence of other imperial forces in Baghdad: 10 bombardiers (humbaraci) in 1723, 1,308 volunteers (gönüllüyan) in 1703, 1,672 commandoes (serdengeçti) in 1742, 3,000 cavalries (süvariyan) in 1776. BOA, AE.SAMD.III 39/3753 (7 M 1135/18 October 1722); BOA, C.AS 920/39745 (6 L 1190/18 October 1776); BOA, C.AS 937/40645 (11ZA 1155/7 January 1743); BOA, D.BŞM.BGH 1/58 (n.d.), 1/60 (n.d.).


113 Evliya Çelebi, *Evliya Çelebi Seyahatnamesi*, 4:252. See also Selim Güngörüler, “Diplomacy and Political Relations between the Ottoman Empire and Safavid Iran, 1639-1722” (Ph.D. diss., Georgetown University, 2016), 113-114. I am grateful to Selim for sharing his dissertation with me.

114 The yerlü neferat units numbered 4,051 men in 1733. BOA, MAD 9934, p. 86 (15 L 1146/21 March 1734).
Table 10. The Janissary and Artillery Corps in Baghdad

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<th>Artillery Carriage Drivers</th>
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Sources: see Appendix A

In addition to boosting troop levels, Istanbul invested in the development of military industrial facilities in the Baghdad fortress, such as a gunpowder mill and a cannon foundry that played a critical role in supporting Ottoman war efforts both in the eastern and western fronts during the sixteenth and seventeenth centuries (see Table 11).115 In the middle of the seventeenth

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century, the Baghdad gunpowder mill employed about 1,000 powder makers (*ustad barutçu*) recruited from those who specialized in pounding coffee beans in the city (*kahve doğücü*). Their humble background working with coffee did not diminish their stature as great masters of their new trade. By Çelebi’s reckoning, the explosive power of the gunpowder they made was second only to that imported from England.\textsuperscript{116} The enlistment of coffee grinders into newly-established gunpowder workshops was emblematic of the broader militarization of both urban infrastructure and society in Baghdad. Popularly known since Abbasid times as the Abode of Peace (*Dar as-Salam*), the city was transformed by Ottoman policies into the Abode of Jihad (*Dar al-Jihad*), as it was commonly referred to in imperial correspondence.

<table>
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<th>Destination</th>
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<td>Mosul</td>
</tr>
<tr>
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<td>Saltpeter: 2,000-3,000 qintar</td>
<td>Rhodes</td>
</tr>
<tr>
<td>1570-1571</td>
<td>Gunpowder: 3,000 qintar</td>
<td>The Ottoman-Venetian war front</td>
</tr>
<tr>
<td>1572-1573</td>
<td>Gunpowder: 1,000-2,000 qintar</td>
<td>The Ottoman-Venetian war front</td>
</tr>
<tr>
<td>1574</td>
<td>Gunpowder: 2,000 qintar</td>
<td>Istanbul</td>
</tr>
<tr>
<td>1577</td>
<td>Gunpowder: unreported amount</td>
<td>Tripoli (modern-day Lebanon)</td>
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<tr>
<td>c. 1583</td>
<td>Gunpowder: 300 qintar</td>
<td>Erzurum</td>
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<td>Gunpowder: 400 qintar</td>
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</tr>
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<td>1609</td>
<td>Gunpowder: unreported amount</td>
<td>Tripoli and Diyarbakır</td>
</tr>
<tr>
<td>1613</td>
<td>Gunpowder: 50 qintar</td>
<td>Zakiyya Fort</td>
</tr>
</tbody>
</table>

Note and sources: see Appendix A

A crude system of control enforced solely by arms, however, could be unduly wasteful. Ottoman logistical support by water and land routes improved the efficiency of riverine fortresses in policing their hinterlands by promoting their co-optive soft power and deep symbolism, sites where Sunni religious institutions clustered and flourished (Table 12). Notables at all hierarchical

\textsuperscript{116} Evliya Çelebi, *Evliya Çelebi Seyahatnamesi*, 4:249.
levels, from the sultan’s household to local provincial families, established and subsidized pious endowments (vakıf) in the basin’s large cities to mark their political power and gain divine favor. The laws, customs, and practicalities governing the relationship between endowed religious structures, on one hand, and their founders, beneficiaries, and revenue sources, on the other, were breathtakingly complex and beyond the scope of this chapter. Most important to our discussion about control was the remarkable degree of oversight the imperial administration exercised over the appointment of staff in charge of religious foundations. A large portion of the correspondence moving between Istanbul and eastern fortresses concerned the appointment of prayer leaders (imam), prayer callers (muezzin), teachers (müderris), sermon deliverers (hatib), preachers (va’iz), prayer reciters (dua-goy), and even floor sweepers (ferraş), to name only a few. Ottoman judges stationed in each city would typically initiate the correspondence with Istanbul, requesting a “noble epistle” (berat-i şerif) from the incumbent sultan to confirm new religious appointments and their salaries paid by the provincial treasury. When a new sultan ascended the throne, requests from provincial centers streamed to Istanbul seeking the renewal of old epistles. Officials at the Imperial Treasury (Hazine-i Amire) meticulously recorded the names and salaries of religious structures, on one hand, and their founders, beneficiaries, and revenue sources, on the other, were breathtakingly complex and beyond the scope of this chapter. Most important to our discussion about control was the remarkable degree of oversight the imperial administration exercised over the appointment of staff in charge of religious foundations. A large portion of the correspondence moving between Istanbul and eastern fortresses concerned the appointment of prayer leaders (imam), prayer callers (muezzin), teachers (müderris), sermon deliverers (hatib), preachers (va’iz), prayer reciters (dua-goy), and even floor sweepers (ferraş), to name only a few. Ottoman judges stationed in each city would typically initiate the correspondence with Istanbul, requesting a “noble epistle” (berat-i şerif) from the incumbent sultan to confirm new religious appointments and their salaries paid by the provincial treasury. When a new sultan ascended the throne, requests from provincial centers streamed to Istanbul seeking the renewal of old epistles. Officials at the Imperial Treasury (Hazine-i Amire) meticulously recorded the names and salaries of religious

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117 For an examination of several endowment projects established in Diyarbakır, Baghdad, and Basra during the second half of the sixteenth century, see Necipoğlu, The Age of Sinan, 462–470.

118 The Ottoman Archive alone holds thousands of documents related to staffing religious foundations in Diyarbakır, Mosul, Baghdad, and Basra. So far, I have closely examined a sample of 100 documents dating between the sixteenth and eighteenth centuries. I have listed them in Appendix B.

119 See, for example, BOA, AE.SAMD.III 118/11598 (Evahir RA 1115/4-13 August 1703); BOA, AE.SABH.I 325/22163 (5 R 1191/13 May 1777); BOA, AE.SABH.I 325/22164 (5 R 1191/13 May 1777); BOA, AE.SABH.I 325/22165 (5 R 1191/13 May 1777); BOA, AE.SMST.II 13/1225 (5 RA 1107/14 October 1695). Other rights to official commissions and land titles had to be renewed following the coronation of a new sultan. The logic behind the custom stems from the Ottoman theory that the entire realm belonged to the sultan, whose will and absolute authority validated all rights. See Halil İnalcık, “Ottoman Methods of Conquest,” Studia Islamica 2 (1954): 103-129, especially 112-113.
appointees in the registers of the Chief Accounting Office (başmuhasabe defterleri) and could confirm and dismiss anyone at will.\textsuperscript{120}

<table>
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<th>Baghdad (c. 1580)</th>
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<tr>
<td>Total</td>
<td>144</td>
<td>93</td>
<td>101</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Imperial patronage and supervision effectively created a pro-Ottoman priestly caste in the Tigris-Euphrates fortresses whose livelihood depended on its continued subservience to the sultan and his deputies and on its anti-Shiʿi, anti-Safavid missionary work. This priesthood joined forces with the weapons-bearing groups deployed by Istanbul and gave their police supervision the appearance of legitimacy and beneficence. In modern jargon, it represented the propaganda arm of the Ottoman government in the east that tapped into the intangible power resources of ideology and culture rather than the firepower of guns and mortars. In ancient terms, it reprised the alliance of throne and altar that underpinned every Mesopotamian state from the Sumerian city states onward. From the pulpits, prayer rows, and study circles, Ottoman clerics in Diyarbakır, Mosul, Mosul, and Baghdad.

\textsuperscript{120} A document dated to 1682 details how officials in the Imperial Treasury retrieved information related to the post of the prayer leader in the Khulafa Mosque Complex in Baghdad to resolve a conflict between two contenders for the post. See BOA, MAD 2926 p. 165 (13 L 1093/14 October 1682).
Baghdad, and Basra awakened a degree of compliance and trust among the faithful masses and reinforced Ottoman authority without constant resort to the threat of force or to payoffs.

A case in point is the shrine of the religious lawyer Abu Hanifa (d. 767), founder of the Hanafi sect that the Ottoman household and most Turks favored over the other three in Sunni Islam—the Maliki, Shafi’i, and Hanbali. Ottoman chroniclers, beginning from Celalzade Mustafa Çelebi (d. 1567), narrated the miraculous “rediscovery” of Abu Hanifa’s burial site on the eastern bank of the Tigris after Süleyman I conquered Baghdad. Their account mirrored the discovery of the tomb of Prophet Muhammad’s companion Abu Ayyub al-Ansari by Mehmed II (d. 1481) after the conquest of Constantinople. While Süleyman was on his way to Baghdad in late 1534, the story has it, the ghost of Abu Hanifa came to an Ottoman herald (çavuş) in a vision and indicated that a teacher (müderris) named Tashqun knew the location of his tomb. When consulted, Tashqun led the Ottoman camp two to three hours north of the Baghdad fortress, where excavators revealed a giant, fragrant rock next to traces of the ancient tomb. On the site, Süleyman ordered the construction of a domed shrine, madrasa, mosque complex, public bath, caravanserai, and forty shops, all surrounded by walls manned by a well-equipped contingent of 150 men. Thereafter, Abu Hanifa’s shrine complex, an extension of the Baghdad fortress, became a monastic colony directly sponsored by Istanbul and the beneficiary of visits and offerings made by sultans, viziers, notables, and ordinary people. The sermon deliverer, preacher, and prayer leader appointed to the site were among the most prominent figures and decision makers in the province, frequently consulted when governors deliberated over major issues facing the region.

122 See, for example, BOA, A.DVN 305/23 (27 L 1117/11 February 1706).
As a result, with their buttressed walls and moats, as well as their domed structures and minarets, riverine fortresses in Iraq, to paraphrase Lewis Mumford, expressed in concrete terms the magnification of the secular and sacred facets of Ottoman power.\textsuperscript{123} They combined the brute coercion of the janissary and artillery corps stationed in the citadels and trenches with the soft power of clerics in houses of worship and learning to exercise intelligent control over their hinterlands and accomplish what each group alone could not.

**Conclusion**

In control of the entire drainage basin after 1534, the Ottoman Empire retrofitted the Tigris and Euphrates with a network of docks, pontoon bridges, and boat construction facilities that allowed it to manage, and profit from, the movement of peoples and goods among Syria, Anatolia, Persia, and Iraq. More importantly, the imperial system of waterborne communication created heavily militarized and Sunnified fortresses that anchored the Ottoman presence in the southern portion of the eastern frontier. Without the Tigris and Euphrates, Ottoman rule in Iraq would have resembled its experience in the Arabian Peninsula or any other peripheral region that lacked useful transport rivers—far less concrete and contingent on the fickle goodwill of tribal and religious leaders. In fact, the main reason the governors of Baghdad were reluctant to take on the Wahhabis after the late eighteenth century, despite being repeatedly admonished by Istanbul to do so, was the difficulty of provisioning an army in the middle of the desert. In the words of the British resident in Baghdad in 1803: “I will not go so far as to say, that, if obliged to retreat, the Pacha and his army will never get back to Bagdad; but I think I may allow myself to mention that, with every

thing hostile to him in front and rear, on the right hand and on the left, with a broken, dispirited, discontented, disorderly, famished army, if he effects a retreat, he will prove himself a great captain." In a region crisscrossed by navigable waterways such as Iraq, on the other hand, Istanbul could easily provision its armies with grain and gunpowder to crush seditious movements and confront foreign enemies. Carriages and vessels transported heavy artillery on the march to besiege enemy targets. The following chapter will show how Ottoman troops could deploy their guns in the river valley to project their power everywhere the Tigris and Euphrates would take them.

“And they thought their fortifications would protect them!”


Arquebuses and cannons fired in unison announcing the departure of 550 Ottoman vessels on the Euphrates River. Spectators in the Birecik Shipyard recoiled at the ceremonial shots’ piercing sound as the sky darkened with black smoke. The naval mission could finally begin on Friday, July 11, 1567 and embark on the calm summer waters. Carrying a force of some 10,000 janissaries, artillerymen, and warriors, the squadron had clear instructions from Istanbul—to “purify” (*pak etmek*) the marshes of Iraq from a descendant of the Ulayyan tribe who dared to challenge the authority of the newly-enthroned sovereign of the realm, Selim II (r. 1566-1574).\(^\text{125}\)

After four months of travel, the Ottoman force fought its first major battle in the marsh village of Sadr al-Bahrain. Soldiers cleared the area at the cost of many lives lost on both sides and started hacking down their enemies’ palm and fruit trees with hatchets. “We [will] obey, do

not cut our trees!” pleaded the inhabitants to no avail. Another round of fighting broke out when more tribesmen came to the scene and confronted the soldiers. Countless locals fell dead alongside their fallen trees.

As it advanced, the expedition turned into a macabre series of atrocities. Captives had their heads chopped off; men, women, and children drowned as they hurriedly fled in boats under the volley fire of the janissaries, who later set abandoned villages, rice fields, and palm groves on fire. Humbled by Ottoman naval power, the rebellious inhabitants surrendered. Their chief’s brother came with his men in forty-six canoes to formally tender his allegiance to the country’s imperial masters. From the middle of the bushes and trees behind him, villagers slowly emerged and stood in rows to watch their mortified chief’s representative kiss the hands of Canbulad Bey, admiral of the Ottoman squadron. “Do not misbehave!” (edepsizlik etmen) was the admiral’s peremptory message to the defeated population before his boat sailed away.

The enormous disparity in manpower and firepower between the two sides could not be starker. Through enormous reed thickets and pools of muddy water, vessels of the imperial navy provided the means for thousands of soldiers, along with their provisions, arms, and ammunitions, to bring the destructive capacity of their guns and artillery to the heart of the Iraqi marshes. Aggravating the threat to the local population was the terrifying frequency at which these floating gun carriers were encroaching on its waters. 1567, after all, was not the first year a squadron fought on the Euphrates, nor were members and allies of the Ulayyan tribe its sole targets. It made an appearance a few times earlier and would remain for many years to come a critical instrument of deadly force against all hostile actors, particularly the ill-armed local tribesmen. To them, cannons

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126 “Muti’ oluruz, eşcarımız kat’ etmen.” Feridun Bey, Nüzhet, fol. 296a.
127 Feridun Bey, Nüzhet, fol. 298b.
of the Ottoman fleet, according to a sixteenth-century chronicler, caused the tremors of doom announcing the Day of Judgment.\footnote{128 “Tarih-i Al-i Osman,” Österreichische Nationalbibliothek, Vienna, Cod. Mixt. 339 Han, fol. 241b.}

This chapter charts the history of the Ottoman gunboat, from its introduction to the Tigris and Euphrates in the sixteenth century until its lapse into irrelevance in the late eighteenth century. For a quarter of a millennium, Istanbul deployed this specialized vessel to prey on smaller boats and riparian villages and carve out a political niche hundreds of miles away in the east. Reliance on the gunboat as an assault and transport craft for power projection gave rise to a naval bureaucracy based in two shipyards at both ends of the drainage basin, Birecik in the north and Basra in the south (Figure 21). Collectively, vessels constructed in both locations comprised what the administration described as the Shatt al-Arab or Shatt River fleet (\textit{donanma-i nehr-i Şatt}), one of several fleets throughout the Ottoman Empire. Others operated in the Sea of Marmara and Aegean Sea and later in the broader Mediterranean, Black Sea, Red Sea, and Indian Ocean—as well as along the Danube River. The Shatt fleet’s founding in the sixteenth century was a local display of a recent global trend in sea warfare that saw the establishment of navies as permanent organizations by increasingly bureaucratized militaries and states.\footnote{129 Jan Glete, \textit{Navies and Nations: Warships, Navies, and State Building in Europe and America, 1500-1860} (Stockholm: Almqvist & Wiksell International, 1993), 2:5-21.} In conjunction with land troops based in fortresses (Chapter 1), shipyards and gunboats allowed Istanbul to field more formidable forces in the Tigris-Euphrates basin than was previously possible and opened the way to the exercise of Ottoman hegemony over the entire region.
Numerous developments in military technology and tactics transformed early modern warfare in a process commonly referred to as the Military Revolution.\textsuperscript{130} As gunpowder artillery improved in the fifteenth century, European seamen (Ottoman Turks included) quickly realized that the new weapon could be critical in deciding the balance of power not only on land but also at sea.\textsuperscript{131} From the Dutch East Indies to the Caribbean, empires began converting their oared

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galleys and sailing ships into floating platforms for heavy artillery. Fighting with guns mounted on ships soon replaced boarding and close combat with infantry weapons as the dominant form of warfare at sea.

This narrative, so far, is well known to military and naval historians. What has been missing from it is Istanbul’s pioneering effort to apply a compact version of ship-borne artillery to navigable rivers as a consistent strategy of imperial control, three centuries before Western Europe’s more familiar push to conquer inland Asia and Africa with steam-powered gunboats.132 This chapter uses the Tigris-Euphrates basin to recount this forgotten episode in the Military Revolution and highlights Ottoman innovation in introducing naval artillery to a fluvial landscape. It opens with a general account of the circumstances that necessitated the establishment and maintenance of a naval infrastructure in West Asia, followed by a closer look at, literally, the nuts and bolts of boat construction.

**Laying the Foundations**

Süleyman I’s conquest of Baghdad in 1534 was an entirely overland affair, but it had important naval implications. It brought under Ottoman control central Iraq, Mesopotamia’s urban heartland and its seat of government since the founding of the Hellenistic city of Seleucia in the fourth

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century BC. The imperial administration recognized the political centrality of Baghdad and referred to it in official correspondence as “the seat of government in the lands of Iraq” (kursi-i memalik-i Iraq). Ottoman rule in the region rested on this urban pedestal, which provided the foundation for the development and elaboration of government institutions, including a navy. Sources attest to the presence of an imperial squadron (donanma-i hümâyûn) on the Tigris shortly after Baghdad’s conquest. In May 1546, officials in Mosul dispatched 120-150 vessels downstream with cannons and provisions to join an expedition to the deep south that resulted in Basra’s incorporation into the Ottoman Empire. The chroniclers who recorded the event, one anonymous and the other a protégé of Grand Vizier Sokullu Mehmed Pasha, leave us without details. We do not know who built the squadron, where, or how.

Birecik (ancient Zeugma) emerged as the river basin’s first imperial shipyard. It initially had a dock engaged in the collection of tolls, a modest revenue source that surged to a record high after Baghdad’s conquest (Table 13). Little is known of what happened until June 1547, when news of Birecik’s stealthy operations reached the Portuguese governor of Hormuz Dom Manuel de Lima. He received an Arab merchant from Basra named Hajji Fayat, who informed him what the Ottomans could do in this “large and well-populated” town. “If the Turks had such an evil purpose,” he claimed after swearing on his Quran, “they could build in the river Euphrates as many

133 BOA, MD 147, no. 348, p. 96 (Evasit M 1153/8-17 April 1740); BOA, AE.SMHD.I 181/14113 (2 C 1157/13 July 1744). See also Katib Çelebi, Cihanıma (Istanbul: Darü’-Tibaati’l-Amire, 1145/1732), 457. Similarly, medieval Muslim geographers referred to Baghdad as the “heart of Iraq.” See Zayde Antrim, Routes and Realms: The Power of Place in the Early Islamic World (New York: Oxford University Press, 2012), 40.
ships as they wanted.” Around that time, the Birecik Shipyard had a permanent staff of forty-five individuals who received tax exemptions for their services. In July 1552, with outside support, the naval staff received from the Imperial Council in Istanbul the first documented order for construction, 300 vessels to be completed under the supervision of one Khayruldin, a leader (za‘im) from Aleppo. From a modest dockyard in 1516, Birecik by 1552 became a major industrial site.

Table 13. Tax Estimates for the Birecik Shipyard

<table>
<thead>
<tr>
<th>Year</th>
<th>1520</th>
<th>1536</th>
<th>1552</th>
<th>1570</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount (guruş)</td>
<td>75,000</td>
<td>180,000</td>
<td>180,000</td>
<td>200,000</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

The stunning impact the Ottoman conquest had on Birecik exemplifies the experience of other riparian settlements. Because of its strategic location amid Anatolia, Syria, and Mesopotamia, Birecik had repeatedly changed hands among the warring powers of Eurasia: Macedonians and Parthians, Romans and Sasanians, Crusaders and Muslims, Byzantines and Seljuks, Mamluks and Akkoyunlus. Incorporation into the Ottoman Empire offered Birecik a...
degree of stability not seen since Roman times, allowing it to become the primary shipyard of a
world power in the Tigris-Euphrates basin.138

Birecik had a unique geo-botanical package that made it an ideal site for shipbuilding.
From a steersman’s perspective, the town is perfectly situated at the northern edge of the Syrian-
Mesopotamian plain. Descending in spectacular cataracts from 6,200 feet (2,000 meters) above
sea level in Erzurum, the Euphrates breaks out of the gorges it has cut through Anatolia’s high
plateaus and establishes a navigable slope by the time it reaches Birecik. Around the town’s
latitude, both the Tigris and Euphrates occupy comparable elevation points (some 1,150 feet or
350 meters), but from there the Euphrates descends gently in wider valleys while the Tigris falls
at a steeper gradient. The upper Euphrates, thus, was hospitable to larger and more sophisticated
rivercraft, making Birecik a more attractive base for the imperial navy than, say, Diyarbakır or
Cizre on the upper Tigris.139

Viewed from the south, Birecik stands out in both its high altitude and proximity to the
Mediterranean, two major sources of moisture in the Middle East. In these respects, the town
sharply differs from all downstream settlements, which become more distant from the Syrian coast
and drier as the Euphrates descends in a south-easterly direction. Wetter conditions endowed
Birecik’s adjacent mountain zones with mixed forests of deciduous and coniferous species suitable
for ship timber. In his intelligence report to the Portuguese in Hormuz, Hajji Fayat made a direct
link between eastern Anatolia’s forest reserves and the rise of the shipbuilding industry in Birecik,

138 For short political histories of the town, see Tahir Öğüt, 18-19 Yüzyıllarda Birecik
Sancaçıında İktisadi ve Sosyal Yapı (Ankara: Türk Tarih Kurumu, 2013), 1-20; Ali Yılmaz,
“Biredijk” (M. Streck and V. J. Parry); İdris Bostan, “Birecik,” Türkiye Diyanet Vakfı
saying: “Near the town of Birecik… there are great forests, from which comes much fine timber and, in addition, there is also pine-wood from which they [the Turks] could build as many ships as they desired, both large and small, by reason of the abundance of timber to be found there.”

Most riparian settlements lacked Birecik’s suitable gradient, stocks of timber, or both.

Despite its unique location on the Tigris-Euphrates estuary, Basra lacked a reliable supply of timber. Shipbuilding, as a result, was considerably more expensive for craftsmen there than it was to their counterparts in the north. The Portuguese explorer Pedro Teixeira pointed out this deficiency in his description of vessels during his visit to Basra in 1604. “Small as they are,” he wrote, “they cost much; for that land has no timber at all, and it is costly to import.” Even when Portugal became an Ottoman rival in the Persian Gulf in the early sixteenth century, Istanbul used its distant Suez squadron led by former Mamluk naval officers to guard its interests in the region. In Piri Reis’s (d. 1554) famous campaign from the Red Sea to the Persian Gulf, Basra simply served as a harbor for his fleet after a failed siege of Hormuz in late 1552.

The Ottoman administration could not ignore Basra for too long. In 1559, it grew concerned that ships owned by the “infidels” came near Lahsa in eastern Arabia, causing fear among Muslim merchants and a decline in revenues collected by ports. Between October 1559 and February 1560, the Imperial Council ordered officials in Zülkadir (in southeastern Anatolia) and Rhodes to provide the material needed for the construction of five galliots in Birecik. From there, the plan went, the new vessels would be sent down to Basra. Meanwhile, the Council

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140 Özbaran, “The Ottoman Turks and the Portuguese,” 73-74.
142 BOA, MD 3, no. 1446, p. 486 (25 ZA 967/17 August 1560).
143 BOA, MD 3, no. 463, p. 169 (28 M 967/30 October 1559), no. 751, p. 259 (5 CA 967/2 February 1560). The initial order was for twenty galliots but was later reduced to eight, then to
asked one of its member viziers, Sokullu Mehmed Pasha, to consult with “those who know” (ehl-i vukuf) and inquire if tribesmen in the south threatened the movement of galliots from Birecik downstream to Iraq. After an investigation, Sokullu, who had served as grand admiral of the Ottoman navy in 1546-1550, recommended shipping the necessary timber to Basra and carrying out all construction in the city, an opinion the Council endorsed. By August 1560, Sokullu had transported the needed timber to Iraq. Basra’s governor soon received orders to send one ship to Lahsa and Qatif on patrol once every two to three months to protect Ottoman ports in the Persian Gulf. Thus, change in leadership, local expert opinion, and further Portuguese encroachment on Ottoman waters brought about the establishment of a permanent shipyard in Basra, the second in the river basin after Birecik.

From this point until the end of the eighteenth century, the Birecik and Basra shipyards became part of a vast network of subsidiary shipbuilding facilities throughout the Ottoman Empire, all linked organizationally to the Imperial Naval Arsenal (Tersane-i Amire) in Galata, Istanbul. Bayezid I built the first large arsenal at Gallipoli, through which Ottoman armies crossed from Anatolia to Rumelia in the fourteenth century, but by the sixteenth century most of the naval establishment had moved to the shores of the Golden Horn. Selim I and Süleyman I oversaw the transition of the navy’s headquarters from Gallipoli to Istanbul and sponsored major expansion

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five. See BOA, MD 3, no. 834, p. 286 (8 C 967/6 March 1560), no. 1185, p. 396 (7 N 967/2 June 1560).
144 BOA, MD 3, no. 764, p. 263 (13 CA 967/10 February 1560), no. 834, p. 286 (8 C 967/6 March 1560).
145 BOA, MD 3, no. 849, p. 290 (12 C 967/10 March 1560).
146 BOA, MD 3, no. 1355, p. 453 (10 Z 967/2 August 1560).
147 BOA, MD 3, no. 1446, p. 486 (25 Z 967/17 August 1560).
projects at the Galata Shipyard. The establishment of shipbuilding facilities in Birecik and Basra mirrors the consolidation of the Ottoman naval administration in Istanbul and sheds light on the development of a new link binding the periphery with the metropolis. Just as provincial treasuries and cannon foundries linked the finances and saltpeter industries of the east to Istanbul, the Birecik and Basra shipyards opened the waters of the Tigris and Euphrates to the resources and patrols of the Ottoman navy.

**Buildup**

Waging war requires massive energy inputs from the environment. The sole aim of the Birecik and Basra shipyards, as military installations, was to exploit the energies of the Tigris and Euphrates to fuel the Ottoman Empire’s military operations. Like watermills, vessels were machines that enhanced humans’ ability to capture the kinetic energy of air and water flows. Through them, Birecik and Basra made the rivers a more efficient energy system, moving massive agglomerations of humans, animals, arms, and raw materials. Vessels, moreover, converted the energy of turbulent flow to a rational form. They could transport grain, after careful planning and calculations, between two predetermined points at a forecasted time to achieve a desired outcome.

The desired outcome of state-sponsored boat building activities in Birecik and Basra was to thwart the challenges to Ottoman hegemony in Iraq and the Persian Gulf. Three major players confronted the Ottoman Empire in the east and triggered most gunboat construction orders: one

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149 The relationship between warfare and nature’s energy is elaborated in Micah S. Muscolino, The Ecology of War in China: Henan Province, the Yellow River, and Beyond, 1938-1950 (New York: Cambridge University Press, 2015), 1-20.
was maritime and European, another overland and Persian, and between them stood an amphibious Arab enemy. The following discussion briefly outlines how each rival influenced Ottoman naval buildup in the region.

A. Portugal

The Ottoman Empire, with about 12 million people in the middle of the sixteenth century, had to contend at sea with the improbable power of Portugal, a nation of some 1.5 million.\footnote{Population figures are derived from Sanjay Subrahmanyam, The Portuguese Empire in Asia, 1500-1700, 2\textsuperscript{nd} ed. (Malden: Wiley-Blackwell, 2012), 38; Halil İnalcık, “The Ottoman State: Economy and Society, 1300-1600,” in An Economic and Social History of the Ottoman Empire, 1300-1914, vol. 1, 1300-1600, ed. Halil İnalcık and Donald Quataert (New York: Cambridge University Press, 1994), 18.} Relying on guns and sails and motivated by a blend of royal mercantilism and Christian messianism, the Iberian empire burst forth from a promontory of Europe into Asia and established a foothold in the southwestern coast of India before the close of the fifteenth century. Partly due to his desire to protect Muslim merchant shipping, Bayezid II at the turn of the sixteenth century became involved in anti-Portuguese maritime operations and supplied arms, experts, and resources to the Mamluk fleet in Suez.\footnote{For a detailed analysis of the motivations and extent of Ottoman naval aid to the Mamluks, see Palmira Brummett, Ottoman Seapower and Levantine Diplomacy in the Age of Discovery (Albany: State University of New York Press, 1994), 69, 75, 111-121.} The Ottomans inherited the Mamluk navy following their conquest of Egypt in 1517 and enhanced and deployed it to join the competition for honor and profits in the Indian Ocean.\footnote{Giancarlo Casale, The Ottoman Age of Exploration (New York: Oxford University Press, 2010), 25-29; Salih Özbekan, “The Ottomans in Confrontation with the Portuguese in the Red Sea after the Conquest of Egypt,” in The Ottoman Response to European Expansion: Studies on Ottoman-Portuguese Relations in the Indian Ocean and Ottoman Administration in the Arab Lands during the Sixteenth Century (Istanbul: Isis Press, 1994), 89-97; Salih Özbekan, “Ottoman Naval Policy in the South,” in Süleyman the Magnificent and His Age: The Ottoman Empire in the Early Modern World, ed. Metin Kunt and Christine Woodhead (New York: Longman, 1995), 55-70; Brummett, Ottoman Seapower, 171-174.}
After rounds of fighting on the open seas from Jidda to the Malacca Straits and the signing of an armistice with the Habsburgs in 1545, the Ottomans faced off against the Portuguese in the Persian Gulf, the former based in Iraq and the latter in Hormuz. From Baghdad, Ottoman troops pushed south, entering Basra in 1546 and conquering Qatif in 1550, prompting Portuguese counter-strikes a year later.\textsuperscript{153} The conflict staggered on with tit-for-tat operations and provided the context for Istanbul’s decision in 1559-1560 to build its first squadron of five galliots in Basra (discussed above).\textsuperscript{154} Despite reaching an unofficial truce with Lisbon and Goa in 1563, Istanbul continued to beef up its fleet in Basra in anticipation of future engagements. It frequently renovated its ships and ordered the construction of five more galliots in 1571.\textsuperscript{155} The naval buildup in Basra proved worthwhile in September 1573, when a Portuguese flotilla raided two Muslim vessels and captured several merchants near Bahrain. An Ottoman squadron of ten galliots in Basra swiftly responded.\textsuperscript{156} Two years later, the imperial administration placed an order for eight galleys to be


\textsuperscript{155} For renovation orders, see BOA, MAD 2775, p. 618 (14 CA 973/7 December 1565); BOA, MD 10, no. 421, p. 270 (28 B 979/16 December 1571). For the construction of five new galliots, see BOA, MD 10, no. 421, p. 270 (28 B 979/16 December 1571); BOA, MD 16, no. 301, p. 152 (28 B 979/16 December 1571); BOA, KK 79, p. 252 (11 R 979/2 September 1571); Yılmaz, “Birecik Saçağt,” 175.

\textsuperscript{156} BOA, MD 22, no. 631, pp. 317-318 (15 CA 981/12 September 1573), no. 632, pp. 318-319 (15 CA 981/12 September 1573), no. 633, p. 319 (15 CA 981/12 September 1573), no. 636, pp. 320-321 (15 CA 981/12 September 1573), no. 638, p. 322 (15 CA 981/12 September 1573), no. 639, p. 322 (15 CA 981/12 September 1573).
built in Basra in a renewed bid to seize the island of Bahrain from Portuguese control, a plan that never materialized.¹⁵⁷

The Ottoman fleet in Basra forcefully challenged that of Portugal but was no match for it. According to Teixeira in 1604, the Ottoman galley was a “small scantling,” “ill-built,” and “not kept against the Portuguese, as someone has written; for the Turks know well that with such they could do no harm.”¹⁵⁸ High Ottoman officials acknowledged their weakness at sea. Grand Vizier Lutfi Pasha (d. 1563), for instance, wrote: “Many of the past sultans have ruled the land, but few have ruled the seas. In the management of naval expeditions, the infidel is superior to us.”¹⁵⁹ The great Mughal emperor Aurangzeb (r. 1658-1707) echoed a strikingly similar sentiment recorded by a visiting British physician: “And if the King’s Fleet be but ordinary, considering so great a Monarch and these Advantages, it is because he minds it not; he contenting himself in the enjoyment of the continent, and styles the Christians Lions of the Sea; saying that God has allotted that Unstable Element for their Rule.”¹⁶⁰

The turn of the seventeenth century gave rise to a calmer political landscape in the Persian Gulf. Europe’s maritime powers ceased to exert a significant pressure on the buildup of Ottoman

¹⁵⁸ Teixeira, The Travels of Pedro Teixeira, 28.
naval forces in Basra. An unofficial truce with Portugal remained largely intact until 1622, when an Anglo-Safavid operation expelled it from Hormuz. The Portuguese moved their headquarters to Muscat and ceded to the British and Dutch empires domination of the approaches to the Persian Gulf. Because of their earlier dealings with the Ottomans in the Mediterranean and the benefits they derived from the trading conditions of the capitulations, the British and Dutch were generally on good terms with Istanbul by the time they became prominent players in the world of the Indian Ocean. Their merchants and chartered companies competed with the Ottomans on the open market without imposing the kind of protection racket that characterized Portuguese seaborne trade. Whatever sparring the Ottomans had with Europe’s newcomers in the Persian Gulf, it was often settled by diplomats rather than gunboats.161

B. Persia

Another challenge to Ottoman armed forces in the east came overland from Persia, home to some 6 million people in the early seventeenth century.162 In 1499, from Lahijan south of the Caspian Sea, a twelve-year-old scion of the house of Safi along with 7,000 of his Turkmen followers began a conquest campaign that a decade later unified the entire Iranian plateau, which had been politically fragmented since the collapse of the Sasanian Dynasty in the seventh century. In military terms, the resurrected Persian empire was effectively a landlocked power without a navy of its own in the Persian Gulf, largely due to the coast’s lack of timber and the difficult terrain that


Ottoman and Safavid forces clashed frequently at the Caucasian and Anatolian borderlands, which stood beyond the reach of the Ottoman navy. The two major exceptions were confrontations over Iraq in 1534-1535 and 1623-1638. The first confrontation occurred before the founding of a squadron on the Tigris and Euphrates. In 1623-1638, the Shatt fleet was already established but in a difficult position. Shah Abbas I’s conquest of Baghdad and Hilla in 1623, as well as the occasional extension of his military influence as far north as Mosul and Ana, brought the most strategic river crossings under Safavid control. Abbas I deprived Ottoman steersmen the safety of navigation and shipwrights in Basra all access to the necessary raw materials and workforce. From Baghdad and Hilla, he dispatched Qizilbash forces to different positions along the rivers, where they actively raided Ottoman boats. Qizilbash raids remained a security concern to Ottoman military logisticians until the forces of Murad IV drove the Safavids out of Iraq in December 1638.\footnote{Katib Çelebi, \textit{Fezleke-i Katib Çelebi} (Istanbul: Ceride-i Havadis Matbaası, 1286/1869), 2:80-81; Mustafa Naima, \textit{Tarih-i Naima} (Istanbul: Darü’l-Tibaati’l-Amire, 1147/1734), 1:428. The inconvenience of river transport for the Ottomans during the Safavid interregnum in Iraq is the}
Yet, despite Safavid pressure, the Ottoman army managed to place orders for hundreds of vessels. During a failed attempt to reconquer Baghdad in 1629, Grand Vizier Hüsrev Pasha ordered the construction of 100 boats in Birecik. A later successful campaign in 1638 involved the construction of 610 boats. Jean-Baptiste Tavernier gives a rare testimony to the prominent role of Ottoman riverboats in the 1638 campaign, noting: “I must confess that in the year 1638, I saw a division of the Grand Signor’s army together with ample ammunition of war go down the Euphrates when he went to besiege Babylon.”

The Ottoman capture of Baghdad and the signing of the Zuhab Treaty in 1639 neutralized the Safavid threat until the latter dynasty’s collapse in 1722, after which the Ottomans, Russians, and Afghans vied for influence in the scramble for Persia. Out of the political chaos, two formidable warriors emerged and brought the war back to the Tigris-Euphrates basin. The first was Nadir Shah, a notorious conqueror from Khorasan who claimed to be an heir of Tamerlane. With perhaps the largest military force in the world (numbering 375,000 men at the peak of his rule in

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subject of a story reported by Vecihi Hasan Çelebi and Katib Çelebi. While in Mosul on their way to Baghdad in November 1638, Murad IV and his retinue debated the possibility of transporting large siege cannons on the Tigris after a large number of the oxen moving them had perished or been exhausted. One group of advisors suggested that sending the artillery by river would be appropriate. Another group objected, suggesting that river transport was insecure and could only be used with caution that would slow the campaign. Murad IV and his chief mufti (şeyhülislam) decided to keep moving twenty artillery pieces by land and the rest by water, the latter reaching the Ottoman camp three weeks later. Vecihi Hasan Çelebi, “Tarih-i Vecihi,” TSMK, Revan MSS 1153, fol. 7b; Katib Çelebi, Fezleke, 2:199. See also Mustafa Naima, Tarih-i Naima, 1:650, 1:653.  

165 Katib Çelebi, Fezleke, 2:115-116.  
166 BOA, MD 87, no. 437, p. 134 (1 B 1047/19 November 1637), no. 464-465, pp. 143-144 (3 Ş 1047/21 December 1637), no. 474, p. 147 (18 N 1047/3 February 1638).  
168 The period between 1639 and 1722 in Ottoman-Safavid relations is best documented by Selim Güngörüler, “Diplomacy and Political Relations between the Ottoman Empire and Safavid Iran, 1639-1722” (Ph.D. diss., Georgetown University, 2016).
1744), Nadir Shah ejected the Ottomans, Russians, and Afghans from Persia and made the country, after a period of national desperation and humiliation, the dominant power from the Caucasus Mountains to the Yamuna River. He encroached on Iraq twice, in 1733 and 1743, triggering two major orders for the Birecik Shipyard, of 300 and 124 vessels respectively. His assassination in 1747 gave rise to another conqueror named Karim Khan (d. 1779), who established his control over the greater part of Persia. After a prolonged siege, his troops occupied Basra from 1775 until 1779, during which the Ottoman administration ordered the construction of 150 vessels in Birecik to take part in the city’s rescue efforts.

Despite some setbacks, Ottoman armies ultimately prevailed and maintained their edge over the armies of Persia’s different rulers between the sixteenth and eighteenth centuries, in part

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170 1734-1735: BOA, D.BŞM.TRE 14694 (Evahir Z 1146/25 May-4 June 1734); BOA, MAD 9934, pp. 95, 167-168, 197, 246, 262 (25 N 1146/1 March 1734), pp. 173-174, 177-178, 309 (9 L 1146/15 March 1734); BOA, C.AS 922/39875 (Evahir Z 1146/25 May-4 June 1734); BOA, C.BH 193/9048 (18 Z 1147/11 May 1735); BOA, C.AS 1104/48809 (22 CA 1147/20 October 1734); BOA, C.BH 85/4078 (15 Ş 1147/10 January 1735); BOA, C.BH 193/9047 (18 CA 1147/16 October 1734). 1743-1746: BOA, C.BH 222/10313 (26 RA 1156/20 May 1743); BOA, MAD 9947, p. 134 (3 R 1156/27 May 1743), p. 375 (15 N 1156/2 November 1743); BOA, MAD 9948, p. 14 (14 S 1157/29 March 1744); BOA, MAD 9952, p. 237 (12 N 1157/18 October 1744); BOA, C.BH 238/11063 (12 N 1157/19 October 1744); BOA, AE.SMHD.I 181/14113 (2 C 1157/13 July 1744); BOA, AE.SMHD.I 129/9464 (23 CA 1157/4 July 1744); BOA, D.BŞM 2855 (1158-1159/1745-1746); BOA, D.BŞM.TRE 14800 (9 R 1158/11 May 1745); BOA, C.AS 709/29745 (10 R 1158/12 May 1745); BOA, AE.SMHD.I 233/18716 (9 RA1158/11 April 1745); BOA, HAT 7/223 (11 CA 1159/1 June 1746).

because they could count on a more complex and effective logistical infrastructure, including a navy.

C. Iraq

The Ottoman navy’s biggest challenge in the east were not the empires of Portugal and Persia but rather peoples of more modest means who, along with their flocks and herds, made a home for themselves in Iraq. A military engagement with this menace was always a daunting task due in no small part to what can be called edge effects that the Ottomans experienced in the region. First, Iraq was an ecological edge. From the Taurus Mountains to the Persian Gulf, the Mediterranean climate maintains its broad characteristics but turns increasingly to a “distorted and exaggerated type,” blistering with summer heat and scanty in precipitation.\(^{172}\) In the colorful words of Evliya Çelebi, “because the clime of Baghdad is exceedingly hot, the Shatt al-Arab flows like the water of a hot bath.”\(^{173}\) On their way to quash a tribal insurrection in summer 1567, Ottoman naval officers grumbled that the alluvium’s weather was “exceedingly hot” (fevkalhad garm ve heraret). They chose to suspend their expedition for two months in the Euphrates town of Hilla until the weather cooled in October.\(^ {174}\) In another instance, the Ottoman army, after briefly reinforcing Basra in February 1701, hastily departed before the summer because, according to a provincial official, the region “is one of the hot countries where the army and beasts of burden could not withstand the weather’s heat.”\(^ {175}\) Iraq’s sultry, searing climate was out of the ordinary for the Ottoman Turks and a major inconvenience during lengthy deployments.


\(^{174}\) Feridun Bey, Nüzhet, 288a.

\(^{175}\) Murtaza Nazmizade, “Gülşen-i Hulefa,” Süleymaniye Kütüphanesi, Halet Efendi MSS 595, fol. 172b. The published version of this work is listed in the Bibliography.
As they marched southeast, Ottoman soldiers experienced another natural oddity—the land beneath them became strangely flat. Incapable of restraining its rivers in high flood from inundation, the low-lying terrain of Baghdad and Basra (less than 165 feet or fifty meters above sea level) was the locus of unique hydrologic conditions, an ecotone between dryland and wetland that had two major implications for the Ottoman army. First, Turkish troops born and raised at higher altitudes (and latitudes) struggled to acclimate to a city surrounded by wetlands like Basra. In April 1560, an unidentified number of troops stationed in the city fell ill and died due to its “heavy air,” according to the authorities’ diagnosis at the time. Second, Istanbul was cognizant that fighting the population of this unconventional landscape required unconventional battlefield tactics and naval technology. In 1552, it instructed subordinates that the 300 vessels built to fight in the southern marshes “should not be like the rest of vessels that typically ply on the Euphrates’ water” (kabil olan Fırat suyunda yürüyen gemiler gebi olmayıp). Instead, Istanbul recommended a specialized vessel design called “derya sandalı,” which could easily pass through the region’s reed thickets (vilayet-i Cezayir’de sazlık içinde yürümeye kabil olup), like modern icebreakers.

Its ecological idiosyncrasies aside, Iraq was a political edge, a reality repeatedly highlighted in correspondence between fidgety Ottoman officials. It seemed from the shores of the Bosporus exceptionally distant, at “the edge of the eastern frontiers” (intiha-i serheddat-i sharqiyye). This geographical anomaly made Iraq “unlike any other country” (qutr-i Iraq sayire-i qiyas olmayıp) and easy prey to the machinations of “the masters of hypocrisy and discord inside

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176 BOA, MD 3, no. 1021, p. 346 (3 Ş 967/29 April 1560).
178 See, for example, BOA, C.AS 1083/47752 (7 M 1174/18 August 1760). Note that Iraq was more distant from the Ottoman capital than the western borderland regions of Hungary and Bulgaria.
and outside” (dirun ve biruni erbab-i nifaq ve shiqaq ile mashhun).\textsuperscript{179} “Malevolent enemies in search of an opportunity” (a’da-i bedkhah ve duşmenan furset nigahi) were always on the lookout.\textsuperscript{180} Provincial officials, such as Basra’s governor in May 1579, felt besieged and helpless, complaining to their superiors in Istanbul that Basra was far away and “surrounded by enemies from four directions” (etraf arba’asi a’da olmak).\textsuperscript{181} Iraq as a country besieged by hostile actors from all sides would become a trope invoked in official correspondence until the nineteenth century.\textsuperscript{182}

Iraq’s autonomous tribal groups saw their political situation differently. From four directions, they found themselves surrounded by potential partners, be they Turks, Portuguese, Persians, or other Arabs, from whom they could pick and choose partners to forge alliances and wage wars. The imperial administration accused them of collaborating with the “Franks” in 1565, a plausible charge given their contacts with the Portuguese on earlier occasions.\textsuperscript{183} Others collaborated with the Persians, as the Zubayd tribe’s sheikh did during Nadir Shah’s siege of Baghdad in 1744. When the siege was over, the city’s governor captured and crucified him for his act of treason.\textsuperscript{184} From this geopolitical accident emerged the Ottoman stereotype of Iraq’s tribesmen as “cohorts of the devils” (sheyatin-i ahzab), wicked and unscrupulous, the whimsical

\textsuperscript{179} BOA, HAT 160/6678 (1 CA 1217/29 August 1802).
\textsuperscript{180} BOA, HAT 664/32310C (1226/1811-1812).
\textsuperscript{181} BOA, MD 36, no. 591, p. 223 (6 RA 987/3 May 1579).
\textsuperscript{182} See BOA, C.DH 323/16139 (Evahir ZA 1175/14-23 June 1762); BOA, HAT 396/20880F (17 Z 1225/13 January 1811).
\textsuperscript{183} BOA, MD 6, no. 1269-1272, pp. 578-580 (13 ZA 972/12 June 1565). Tribesmen in Basra pleaded to Portuguese authorities to form an anti-Ottoman alliance on the eve of the Ottoman conquest of Basra in 1546. See Casale, The Ottoman Age of Exploration, 77-78; Özbaran, Ottoman Expansion toward the Indian Ocean, 188.
\textsuperscript{184} Kerküklü Resul Havi Efendi, Tarihu Devhatül Vüzerə ve Zeyli Gülşen-i Hulefa (Baghdad: Dar al-Tiba’a, 1246/1830), 80. For a similar case of Arab-Persian collaboration during the Zand conquest of Basra in 1776, see John R. Perry, Karim Khan Zand (Oxford: Oneworld, 2006), 78.
arbitrariness of their political loyalties always presumed to shift with the wind. In the words of Kerküklü Resul Havi Efendi (d. 1826), an Ottoman official in Baghdad: “From old [times], the tribes of Iraq are predisposed to hypocrisy and given to error and discord.” Bureaucrats found support for this view in the oft-quoted Quranic verse: “The desert Arabs are the most stubborn of all peoples in their disbelief and hypocrisy. They are the least likely to recognize the limits that God has sent down to His Messenger” (9:98).

Lastly, in human terms, Iraq was “a refuge for Arab nomadic tribes” (meʿva-i aṣayir ve qabayil-i ʿurban) and marked the edge between, as Ottoman officials saw it, civilization and barbarism. The Arab of this world, unlike the refined Sunni minority in Baghdad or Basra, was a barefoot and naked savage (ʿurban-i ʿuryan/hufat ve ʿurat-i aʿrab) who spoke the barbarian’s language, an unintelligible speech Ottoman authorities could hardly comprehend. He seemed to literally burble, uttering “gibberish talk and unknown words” (bōn bōn kelam ve na maʾlum sözler). He and his kin “babbled like crows” (surat ghurab qil ve qal), according to a sixteenth-century Ottoman author. The official discourse of the Ottoman and Baghdad’s Sunni elite

185 BOA, MD 5, no. 933, p. 353 (19 B 973/9 February 1566).
186 Kerküklü, Tarihu Devhatül Vüzerä, 94.
187 BOA, HAT 820/37374f (21 RA 1244/1 October 1828).
188 BOA, HAT 118/4774 (1215/1800-1801).
191 Lokman bin Hüseyin, “Mücmel-ul-Tumar,” fol. 68b. Domenico Sestini, one of the most astute European observers visiting the country in our period, took note of the Arab tribes’ unique dialect, which he described as “different from Arabic” and “understood only by the inhabitants of the desert.” Domenico Sestini, Voyage de Constantinople à Bassora en 1781 par le Tigre et
reduced him to the state of an animal, using zoological terms to describe him: pig, dog, and rat.\(^{192}\)

The dog in particular was a favorite simile to describe Iraq’s Arab nomad because the plural form of both nouns rhymed with each other: \(A'\text{rab}, \text{kilab}.\)

Ecologically, politically, and socially quirky, Iraq became the Ottoman Empire’s dark underbelly in the east, comparable to its position within the Assyrian Empire during the early first millennium BC.\(^{193}\) When required to venture into this mystifying world, Ottoman expeditions tended to include significant naval force. Beyond the needs of the battlefield, maintaining a squadron was critical to police and govern the area. In a letter addressed to the newly appointed governor of Basra in 1704, the imperial administration outlined his duties and the benefits he could derive from the fleet at his disposal. “With the force of the Imperial Navy’s vessels,” it explained, “it is easier to collect the customs of Basra and the tax dues of the marshes.”\(^{194}\) In the words of Teixeira in 1604, Ottoman galleys in Basra “are for use in the river and thereabouts, to keep in order the rebellious Arabs, from whom they [the Turks] exact heavy tribute.”\(^{195}\) To crush the Arab tribes at war and exact tribute from them at peace, Istanbul placed numerous small and large construction and renovation orders in Birecik and Basra, as well as Raqqa and Baghdad, between the sixteenth and eighteenth centuries (see Table 14).

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\(^{194}\) BOA, MAD 10306, pp. 183-184 (10 M 1116/14 May 1704).

\(^{195}\) Teixeira, \(The Travels of Pedro Teixeira,\) 28.
Table 14. Ottoman Naval Buildup in the Tigris-Euphrates Basin

<table>
<thead>
<tr>
<th>Year</th>
<th>Project Type</th>
<th>Shipyard</th>
<th>Number of Vessels</th>
<th>Vessel Types</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1552</td>
<td>Construction</td>
<td>Birecik</td>
<td>300</td>
<td>Sandal</td>
<td>Not reported</td>
</tr>
<tr>
<td>1559-1560</td>
<td>Construction</td>
<td>Basra</td>
<td>5</td>
<td>Galliots</td>
<td>Portugal</td>
</tr>
<tr>
<td>1565-1567</td>
<td>Construction</td>
<td>Birecik</td>
<td>400</td>
<td>250 army boats + 150 cargo boats</td>
<td>Iraq</td>
</tr>
<tr>
<td>1571</td>
<td>Construction</td>
<td>Basra</td>
<td>5</td>
<td>Galliots</td>
<td>Portugal</td>
</tr>
<tr>
<td>1575</td>
<td>Construction</td>
<td>Basra</td>
<td>8</td>
<td>Galleys</td>
<td>Portugal</td>
</tr>
<tr>
<td>1629</td>
<td>Construction</td>
<td>Birecik</td>
<td>100</td>
<td>Cargo boats</td>
<td>Persia</td>
</tr>
<tr>
<td>1637-1638</td>
<td>Construction</td>
<td>Birecik</td>
<td>610</td>
<td>Not reported</td>
<td>Persia</td>
</tr>
<tr>
<td>1695-1696</td>
<td>Construction</td>
<td>Raqqa</td>
<td>10</td>
<td>Army boats</td>
<td>Iraq</td>
</tr>
<tr>
<td>1699</td>
<td>Construction</td>
<td>Raqqa</td>
<td>30</td>
<td>Army boats</td>
<td>Iraq</td>
</tr>
<tr>
<td>1699-1701</td>
<td>Construction</td>
<td>Birecik</td>
<td>98</td>
<td>60 frigates + 25 felucca and sandal + 5 kayak + 8 üstüaçık</td>
<td>Iraq</td>
</tr>
<tr>
<td>1703</td>
<td>Construction</td>
<td>Basra</td>
<td>“a few” (bir kaç)</td>
<td>Galleons</td>
<td>Iraq</td>
</tr>
<tr>
<td>1706</td>
<td>Renovation</td>
<td>Basra</td>
<td>?</td>
<td>Galleon</td>
<td>Iraq</td>
</tr>
<tr>
<td>1706</td>
<td>Renovation</td>
<td>Baghdad</td>
<td>16</td>
<td>14 iškampoye + 2 frigates</td>
<td>Iraq</td>
</tr>
<tr>
<td>1709</td>
<td>Renovation</td>
<td>Basra</td>
<td>12</td>
<td>Frigates</td>
<td>Iraq</td>
</tr>
<tr>
<td>1709</td>
<td>Construction</td>
<td>Birecik</td>
<td>16</td>
<td>Üstüaçık</td>
<td>Iraq</td>
</tr>
<tr>
<td>1711</td>
<td>Renovation</td>
<td>Basra</td>
<td>11</td>
<td>iškampoye</td>
<td>Iraq</td>
</tr>
<tr>
<td>1719-1720</td>
<td>Construction</td>
<td>Birecik</td>
<td>20-39</td>
<td>Not reported</td>
<td>Iraq</td>
</tr>
<tr>
<td>1728</td>
<td>Construction</td>
<td>Basra</td>
<td>20</td>
<td>Frigates</td>
<td>Iraq</td>
</tr>
<tr>
<td>1730</td>
<td>Construction</td>
<td>Basra</td>
<td>15</td>
<td>5 frigates + 10 iškampoye</td>
<td>Iraq</td>
</tr>
<tr>
<td>1734-1735</td>
<td>Construction</td>
<td>Birecik</td>
<td>300</td>
<td>Not reported</td>
<td>Persia</td>
</tr>
<tr>
<td>1743-1746</td>
<td>Construction</td>
<td>Birecik</td>
<td>124</td>
<td>Not reported</td>
<td>Persia</td>
</tr>
<tr>
<td>1777</td>
<td>Construction</td>
<td>Birecik</td>
<td>150</td>
<td>Not reported</td>
<td>Persia</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

In a nutshell, security anxiety and conflicts with Portugal, Persia, and Iraqi tribesmen created incentives for the Ottoman Empire to maximize its naval strength and maintain a provincial squadron in the Tigris-Euphrates basin. The agitated state of affairs was unique to the early modern era, in which the river basin was dominated in its entirety by a Sunni Turkish empire in frequent conflict within and on every side with Christian Europeans, Shi‘i Persians, and tribal Arabs of
mixed Muslim persuasions. In other historical periods, a naval industry on the scale the Ottomans established was either unnecessary or impossible to set up. It was unnecessary when the river basin was remote from a ruling power’s frontier conflicts, as was the case during the Umayyad and Abbasid periods. Likewise, the Ottomans’ comprehensive naval infrastructure could not have emerged without political cohesion that the region lacked for most of its history.

**Rivercraft**

The Tigris and Euphrates and the opportunities they provided for irrigation and communication facilitated the rise of a complex society in its alluvial plain during the fourth millennium BC. Yet both rivers, with their rapids, shallows, and prevailing northerly wind, arrested nautical development in the region and posed geomorphic obstacles to the widespread use of large ships. For most of history, the river basin’s predominant vessels remained small and light, made of local materials such as animal skin, reed, timber, and brushwood. With its immense human, natural, and fiscal resources, the Ottoman Empire broke the innovation bottleneck and introduced a highly-developed squadron based on the more advanced nautical traditions of the Mediterranean that it had inherited from Byzantium and acquired through its rivalries at sea with other maritime powers, particularly the Venetians. Vessels of the Ottoman Shatt fleet, moreover, acquired greater offensive lethality by adopting the latest improvements in ship design to tap into the combined capabilities of streamflow energy, human and animal muscle, and heavy ordnance.

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## Table 15. Size of the Shatt Fleet

<table>
<thead>
<tr>
<th>Date</th>
<th>Vessel Types</th>
<th>Crew</th>
</tr>
</thead>
<tbody>
<tr>
<td>1565</td>
<td>2 galleys</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>5 galliots</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Total: 7 vessels</td>
<td>?</td>
</tr>
<tr>
<td>1567</td>
<td>9 galleys</td>
<td>?</td>
</tr>
<tr>
<td>1573</td>
<td>14 galleys</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>2 galliots</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Total: 16 vessels</td>
<td>?</td>
</tr>
<tr>
<td>1576</td>
<td>14 galleys</td>
<td>?</td>
</tr>
<tr>
<td>1705</td>
<td>10 frigates</td>
<td>400 (40 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>5 işkampoye</td>
<td>55 (11 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>3 kayık</td>
<td>27 (9 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>Total: 18 vessels</td>
<td>Total: 482 persons</td>
</tr>
<tr>
<td>1706</td>
<td>15 frigates</td>
<td>525 (35 on each vessel)</td>
</tr>
<tr>
<td>1707</td>
<td>1 frigate (başarda)</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>19 frigates</td>
<td>675 (on average 35 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>5 işkampoye</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>2 kayık kırıncı</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>2 kayık piyade</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>3 üstüaçıç</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Total: 32 vessels</td>
<td>Total: 725 persons</td>
</tr>
<tr>
<td>1709</td>
<td>1 frigate (başarda)</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>16 frigates</td>
<td>400 (on average 25 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>1 şayka</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>3 işkampoye</td>
<td>30 (10 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>1 kırıncı</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total: 22 vessels</td>
<td>Total: 484 persons</td>
</tr>
<tr>
<td>1709-1710</td>
<td>20 firqa tta</td>
<td>725 (on average 35 on each vessel)</td>
</tr>
<tr>
<td>1711</td>
<td>20 frigates</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>5 işkampoye</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>4 kırıncı</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Total: 29 vessels</td>
<td>?</td>
</tr>
<tr>
<td>1713</td>
<td>20 frigates</td>
<td>?</td>
</tr>
<tr>
<td>1731</td>
<td>5 large frigates</td>
<td>175 (35 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>20 small frigates</td>
<td>155 (on average 8 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>10 işkampoye</td>
<td>170 (17 on each vessel)</td>
</tr>
<tr>
<td></td>
<td>Total: 35 vessels</td>
<td>Total: 500 persons</td>
</tr>
</tbody>
</table>

Note and sources: see Appendix A

In the sixteenth and seventeenth centuries, the galley and galliot formed the backbone of the Ottoman navy in the drainage basin and throughout the empire. In 1573, the Shatt fleet included
fourteen galleys and two galliots (see Table 15). They constituted a salient feature of the Ottoman order in the region, noted by a British merchant visiting in 1583: “The chief strength [of the Turk] is of gallies which are about five and twenty or thirty very faire and furnished with goodly ordnance.”¹⁹⁷ The galley (kadırğa) was a large seagoing oared vessel developed during the second millennium BC and refined over time by civilizations of the eastern Mediterranean.¹⁹⁸ The Turks became familiar with it following the rise of the first Turkish principalities on the Marmara and Aegean coasts in late medieval times.¹⁹⁹ On the Tigris and Euphrates, the Ottoman galley was armed with one cannon fitted into the prow (baş topu), two culverin-type guns (kolumburina), and four light battering guns called darbzen.²⁰⁰ The galliot (kalyata), a favorite of Mediterranean corsairs, was smaller than the galley and a much more recent innovation. In the sixteenth century, the Ottomans introduced it to the Tigris and Euphrates, as well as the Black and Red Seas, after adopting it a century earlier in their first naval base in Gallipoli.²⁰¹ The Ottoman galliot on the Tigris and Euphrates came in different sizes, the smallest with sixteen and largest with twenty-two oar benches.²⁰² It could carry nearly as many cannon as the galley did.²⁰³ In action, the firepower

¹⁹⁸ Casson, Ships and Seamanship, 30-76.
²⁰⁰ BOA, MAD 2775, p. 618 (14 CA 973/7 December 1565). On the kolumburina and darbzen, see Ágoston, Guns for the Sultan, 81-85.
²⁰¹ İdris Bostan, Kürekli ve Yelkenli Osmanlı Gemileri (Istanbul: Bilge, 2005), 224-228.
²⁰² Willem Floor, The Persian Gulf, 173; Özbaran, “The Ottoman Turks and the Portuguese,” 56; Özbaran, Ottoman Expansion toward the Indian Ocean, 192.
²⁰³ BOA, MAD 2775, p. 618 (14 CA 973/7 December 1565).
of galleys and galliots destroyed local boats and mudbrick forts that had helped tribes of the alluvial plain remain independent for many centuries.\textsuperscript{204}

The second half of the seventeenth century marked the Ottoman navy’s transition from oar-powered to sail-powered ships, a move that began during the Cretan War with Venice (1645-1669) and was adopted as a policy by Grand Vizier Merzifonlu Kara Mustafa Pasha (d. 1683) a year before his death.\textsuperscript{205} Istanbul became convinced of the sailing galleon’s advantages over traditional oared galleys, such as its ability to better utilize wind energy, accommodate artillery, and minimize the need for oarsmen and warriors (along with their food and water barrels) on board. Previously used solely for transport purposes, the galleon would displace the galley as the empire’s main fighting ship by late eighteenth century.\textsuperscript{206} The ripple effect of this transition extended to the Basra Shipyard around 1703, when it received the first order for the construction of galleons.\textsuperscript{207} A large ship like the galleon, however, was more suitable to the open sea and made little headway in the river basin, where its use was always limited.

More successful on the Tigris and Euphrates than the large galleon was another military innovation that became prevalent around the same time—the frigate (\textit{firkate}). Powered by oars and sails, the frigate was a long, narrow, and fast ship that could operate successfully on rivers and

\begin{itemize}
\item \textsuperscript{204} For accounts on the use of boat cannon in conflicts with Iraq’s tribesmen, see “Tarih-i Al-i Osman,” fol. 240b-243a; Lokman bin Hüseyin, “Mücmel-ul-Tumar,” ff. 67b-69a; BOA, MD 46, no. 49, p. 25 (27 B 992/4 August 1584); BOA, MD 69, no. 75, pp. 43-1 (22 R 1000/6 February 1592).
\item \textsuperscript{205} Jonathan Grant, “Rethinking the Ottoman ‘Decline’: Military Technology Diffusion in the Ottoman Empire, Fifteenth to Eighteenth Centuries,” \textit{Journal of World History} 10, no. 1 (1999): 179-201; Bostan, \textit{Osmanlı Gemileri}, 103-147, 278-291.
\item \textsuperscript{207} BOA, MAD 7915, pp. 416-418 (22 S 1115/7 July 1703); BOA, AE.SMST.II 2/171 (22 S 1115/7 July 1703).
\end{itemize}
at sea. The Imperial Naval Arsenal adopted it in the Mediterranean, Black Sea, and on the Danube after 1689, after which the frigate became indispensable in the wars with Europe during the eighteenth and nineteenth centuries.\(^{208}\) A decade later, the first frigates (sixty in total) were ordered and completed in the Birecik Shipyard.\(^{209}\) They proved their effectiveness and became since then the backbone of the Shatt fleet (see Table 15). Frigates came in different sizes but on average were some sixty-five feet (20.5 meters) long and ten feet (3.5 meters) wide and had sixteen oar benches.\(^{210}\) They could carry a crew of seventy individuals, a number authorities mustered only in major campaigns.\(^{211}\) The largest frigate was called \(başarda\) and likely served as the Shatt admiral’s official ship, which normally carried fifty persons. The vast majority were slightly smaller and carried thirty-five: one steersman, two tenders of sails, two gunners, and twenty-eight other persons, perhaps serving as fighters and oarsmen.\(^{212}\) The Tigris-Euphrates frigate could carry seven cannons: two at the bow and stern, one broadside, and four others with small caliber firing grapeshot (\(saçma\) topu).\(^{213}\)

Supplementing the frigate were three riverboats that the Ottoman Empire transplanted from the Danube to the Tigris and Euphrates during the early eighteenth century. The first was called \(şayka\), a word derived from Russian (\(chayka\)) meaning seagull. It was a flat-bottomed, wide, and oared ship built in the shipyards of the Danube since the sixteenth century and used on the Black

\(^{208}\) Bostan, \(Osmanlı\) Gemileri, 228-233.
\(^{209}\) BOA, MAD 4879, p. 118 (29 \(Z\) 1110/27 June 1699); BOA, MAD 7915, pp. 268, 272-275, 375-376, 392 (2 \(R\) 1111-1 Ramazan 1112/26 September 1699-18 February 1701); BOA, D.BŞM.TRE 14598, p. 8 (16 \(R\) 1112/29 September 1700); BOA, MAD 5433 (6 \(N\) 1112/14 February 1701).
\(^{210}\) Size measurements are found in BOA, C.BH 90/4305 (18 CA 1112/31 October 1700); BOA, MAD 7915, p. 268 (11 \(B\) 1111/2 January 1700).
\(^{211}\) See, for example, BOA, MAD 975, p. 15 (28 Safar 1112/14 August 1700).
\(^{212}\) BOA, MAD 7915, pp. 350-351 (17 \(B\) 1143/26 January 1731).
\(^{213}\) BOA, C.BH 90/4305 (18 CA 1112/31 October 1700). On \(saçma\), see Ágoston, \(Guns\) for the \(Sultan\), 86-87.
Sea and Dnieper River as well. The şayka appeared in the Basra Shipyards in 1709, manned by eight individuals. Around the same time, two other Danubian vessels became part of the Shatt fleet, the işkampoye and üstüçık, both oared and used for communication and the transport of soldiers, carriages, and other heavy loads (Table 15). None of these vessels could have appeared in the drainage basin without the free movement of labor across regions once politically divided and now part of a unified empire.

**Labor**

As major industrial sites, the arsenals of Birecik and Basra needed a large and reliable supply of men capable of designing, building, and manning the boats, something both places lacked. Birecik was a small fort with only four neighborhoods (mahalle) and a taxable population that did not surpass 1,000 for most of the sixteenth century (see Table 16). The Basra fortress’s larger population, about four times the size of Birecik’s, was handicapped by a low population density (see Table 17). Recruiting locals to Basra’s shipyard, provincial officials noted in 1572, could reduce the labor force needed to cultivate the land. On another occasion, authorities found a shortage of carpenters and sawyers available in the city and had to recruit them from Anatolia. Basra’s population makeup was another problem for shipyard officials. Crewmen from the city were either Arabs or Qizilbash whom the Ottomans regarded as “neither safe nor reliable” (emniyet ve i’timad olmamak) to man the vessels. Istanbul maintained a similar attitude toward Christian

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214 Bostan, Osmanlı Gemileri, 236-242.
216 BOA, MD 19, no. 293, p. 139 (13 S 980/24 June 1572).
217 BOA, MD 27, no. 511, p. 223 (26 L 983/28 January 1576).
218 BOA, MAD 7915, pp. 350-352 (17 B 1143/26 January 1731). In this context, Qizilbash could mean Shi’is in general.
crewmen in the Black Sea and Mediterranean, whom it could not trust in battles against Europe’s Christian powers.\textsuperscript{219}

Table 16. Birecik’s Taxable Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Households</th>
<th>Bachelors</th>
<th>Imams</th>
<th>Shipyard Personnel</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1520</td>
<td>770</td>
<td>61</td>
<td>0</td>
<td>0</td>
<td>831</td>
</tr>
<tr>
<td>1536</td>
<td>533</td>
<td>111</td>
<td>4</td>
<td>0</td>
<td>648</td>
</tr>
<tr>
<td>1552</td>
<td>574</td>
<td>243</td>
<td>8</td>
<td>45</td>
<td>825</td>
</tr>
<tr>
<td>1570</td>
<td>644</td>
<td>257</td>
<td>8</td>
<td>63</td>
<td>972</td>
</tr>
</tbody>
</table>

Source: see Appendix A

Table 17. The Basra Fortress’s Taxable Population

<table>
<thead>
<tr>
<th>Year</th>
<th>Households</th>
<th>Bachelors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1552</td>
<td>2,860</td>
<td>16</td>
<td>2,876</td>
</tr>
<tr>
<td>1590</td>
<td>3,779</td>
<td>70</td>
<td>3,849</td>
</tr>
</tbody>
</table>

Source: see Appendix A

The local populations of Birecik and Basra alone could not fulfill the demands of an imperial naval arsenal. Ottoman authorities had to adjust the natural population distribution of the land to carry out the sultan’s wishes and maintain his navy in the east. They did so by mobilizing laborers from provinces near and far and moving them around like pieces on a chessboard.\textsuperscript{220}

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A. Artisans

The populations of nearby towns partially fulfilled Birecik’s demand for artisans. In 1701 and 1734, Diyarbakır, Maraş, Ayntab, Kilis, Ruha, Malatya, and Aleppo dispatched dozens of carpenters, caulkers, loggers, and cutlers to work along with local artisans in Birecik’s shipyard.\(^{221}\) When needed, artisans from the Birecik area served in Basra’s shipyard, as happened in 1576, when Istanbul ordered the governor of Ayntab to send fifteen carpenters and sawyers to assist in a construction project.\(^{222}\)

Ottoman authorities deployed artisan and maritime populations from the far corners of the empire to serve in the region. Some were hauled from Europe without consent. In 1565, for instance, the governor of Basra petitioned the imperial administration to send a cooper and an experienced carpenter to his shipyard. Istanbul forwarded the request to the grand admiral of the Mediterranean fleet, ordering him to dispatch the requested workforce from among the “infidel” prisoners he held in custody, likely captured from a European naval force.\(^{223}\)

A less coerced group came from Istanbul. Steward of the Imperial Naval Arsenal (tersane emini), sometimes in collaboration with officials at the Imperial Arsenal of Ordnance and Artillery (Tophane-i Amire), recruited missions from the capital comprised of a diverse group of artisans, including caulkers, carpenters, blacksmiths, and makers of oars, pulleys, lanterns, and sail cloth (see Table 18).\(^{224}\) Those recruited hailed from different neighborhoods in Istanbul. In the mission to Basra in 1728, for instance, the heads of the corps of carpenters and caulkers were from

\(^{221}\) BOA, MAD 5433 (6 N 1112/14 February 1701); BOA, C.AS 922/39875 (20 Z 1146/24 May 1734).
\(^{222}\) BOA, MD 27, no. 511, p. 223 (26 L 983/28 January 1576).
\(^{223}\) BOA, MAD 2775, p. 642 (6 CA 973/29 November 1565). For the use of prisoners of war in the Imperial Naval Arsenal, see Imber, “The Navy of Süleyman the Magnificent,” 269.
\(^{224}\) On the Imperial Naval Arsenal’s steward, see Bostan, Osmanlı Bahriye Teşkilati, 33-38.
Tozkoparan (Güngören) and Hacıahmet (Beyoğlu), the latter having two caulkers from Eyüp working under his supervision. Artisans from Tophane, Kasımpaşa, Samatya, Galata, and Acıçeşme also appear in Birecik and Basra during different missions.

Table 18. Naval Missions from Istanbul to Birecik and Basra

<table>
<thead>
<tr>
<th>Year</th>
<th>Mission Size</th>
<th>Mission Composition</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1565</td>
<td>10</td>
<td>1 architect, 3 carpenters, 3 oar makers, 2 caulkers, 1 blacksmith</td>
<td>Birecik</td>
</tr>
<tr>
<td>1566</td>
<td>4</td>
<td>4 caulkers</td>
<td>Basra</td>
</tr>
<tr>
<td>1579</td>
<td>3</td>
<td>3 shipwrights</td>
<td>Basra</td>
</tr>
<tr>
<td>1699-1701</td>
<td>10</td>
<td>1 captain, 1 captain’s servant, 1 carpenter, 1 mountain architect, 2 blacksmiths, 1 oar maker, 1 caulk, 1 auger, 1 carriage maker</td>
<td>Birecik</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>20 caulkers, 20 carpenters, 20 kayık makers, 4 pulley makers, 3 makers of sail cloth, 2 lantern makers, 3 mast makers, 2 oarsmen</td>
<td>Birecik</td>
</tr>
<tr>
<td>1702</td>
<td>30</td>
<td>10 caulkers, 10 carpenters, 10 oar makers</td>
<td>Birecik</td>
</tr>
<tr>
<td>1706</td>
<td>35</td>
<td>5 captains, 15 carpenters, 10 caulkers, 1 pulley maker, 2 blacksmiths, 2 riggers</td>
<td>Baghdad</td>
</tr>
<tr>
<td>1708</td>
<td>2</td>
<td>2 captains</td>
<td>Basra</td>
</tr>
<tr>
<td>1711</td>
<td>15</td>
<td>8 carpenters, 7 caulkers</td>
<td>Basra</td>
</tr>
<tr>
<td>1719</td>
<td>15</td>
<td>7 carpenters, 6 caulkers, 2 rowers</td>
<td>Basra</td>
</tr>
<tr>
<td>1728</td>
<td>28</td>
<td>10 carpenters, 10 caulkers, 8 carpenters</td>
<td>Basra</td>
</tr>
<tr>
<td>1730</td>
<td>12</td>
<td>5 carpenters, 5 caulkers, 1 foundry man, 1 cauldron maker</td>
<td>Basra</td>
</tr>
<tr>
<td>1731</td>
<td>204</td>
<td>200 seasonal workers, 4 captains</td>
<td>Basra</td>
</tr>
<tr>
<td>1734</td>
<td>26</td>
<td>15 carpenters, 10 caulkers, 1 logger</td>
<td>Birecik</td>
</tr>
<tr>
<td>1737</td>
<td>1</td>
<td>1 carpenter</td>
<td>Basra</td>
</tr>
<tr>
<td>1744</td>
<td>5</td>
<td>5 caulkers</td>
<td>Birecik</td>
</tr>
<tr>
<td>1767</td>
<td>8</td>
<td>4 carpenters, 4 caulkers</td>
<td>Basra</td>
</tr>
<tr>
<td>1780</td>
<td>12</td>
<td>6 carpenters, 6 caulkers</td>
<td>Basra</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

The Imperial Naval Arsenal brought to the region artisans from outside the capital in other parts of the Ottoman Empire, notably coastlines and straits with rich maritime traditions. In 1560,

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225 BOA, MAD 7915, pp. 346-347 (20 C 1140/1 February 1728).
the Imperial Council ordered the governor of the Greek island of Rhodes to dispatch forty to fifty shipwright masters (ustad gemici) and caulkers from Rhodes and Kos (İstanköy) to serve in Birecik’s shipyard.  

226 Officials in Cyprus, Sidon, Tripoli, and Beirut received orders in 1699-1700 to recruit and send to Birecik an unspecified number of shipwrights, carpenters, oarsmen, caulkers, and augerers (a person who uses an auger to drill holes in timber).  

227 During a construction project in Birecik in 1777, Istanbul ordered officials in the east Mediterranean towns of Payas, Antakya, and Latakia to recruit ten caulkers.

On many other occasions, the identities of artisans deployed to the region are not explicit but can be recognized from their toponymic nicknames recorded in the registers. In one mission to Birecik in 1699-1700, thirty percent of the artisans were from the Black Sea, Greece, and Kocaeli (İzmit) (see Table 19).  

229 Out of sixty captains, each leading a frigate on the Euphrates in 1702, three were from Rhodes and one each from Kos, Lesbos, and Egypt.  

230 Lastly, eight carpenters from Ganja (Azerbaijan) and one from Izmir joined different naval missions from Istanbul to Basra in 1728 and 1730, respectively (Table 19).

Among foreign maritime populations arriving in Birecik and Basra, the prominence of Greek artisans stands out, given the great distance they had to traverse and their repeated deployments since the sixteenth century. Their vital role in the Naval Arsenal in Istanbul, in

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226 BOA, MD 3, no. 751, p. 259 (5 CA 967/2 February 1560). The location for the construction project later moved from Birecik to Basra. See BOA, MD 3, no. 849, p. 290 (12 C 967/10 March 1560).

227 BOA, D.BŞM.TRE 14598, p. 2 (16 R 1112/26 September 1700); BOA, MAD 9885, pp. 177-178 (15 R 1111/10 October 1699); BOA, C.BH 149/7106 (15 R 1111/10 October 1699).

228 BOA, MAD 10017, 39 (19 S 1191/29 March 1777).

229 For a useful guide to Greek names as transcribed in Ottoman documents, see Fariba Zarinebaf, John Bennet, and Jack L. Davis, A Historical and Economic Geography of Ottoman Greece: The Southwestern Morea in the 18th Century (Athens: The American School of Classical Studies at Athens, 2005).

230 BOA, MAD 7915, p. 409 (15 CA 1114/7 October 1702).
missions to Birecik and Basra, and in the maritime history of the Ottoman Empire more generally is comparable to the role they played under the shadow of other empires in control of the Dodecanese islands, including ancient Rome, which actively recruited Hellenized sailors to its imperial fleet.231

Table 19. Artisan Identities in Imperial Missions to Birecik and Basra

<table>
<thead>
<tr>
<th>Year</th>
<th>Artisans and Their Identities</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1699-1700</td>
<td><strong>Mission A</strong>&lt;br&gt;• <strong>The Danube River:</strong> 1 admiral (from Vidin)&lt;br&gt;• <strong>Greece:</strong> 1 carpenter (from Chios)&lt;br&gt;• <strong>Istanbul:</strong>&lt;br&gt;  - Beyoğlu: 1 blacksmith (from Kasımpaşa), 1 oar maker (from Tophane)&lt;br&gt;<strong>Mission B</strong>&lt;br&gt;• <strong>Istanbul:</strong>&lt;br&gt;  - Beyoğlu: 1 caulker and 3 shipwrights (from Tophane), 3 mast makers and 1 pulley maker (from Galata), 1 carpenter and 3 shipwrights (from Kasımpaşa)&lt;br&gt;  - Eyüp: 2 shipwrights&lt;br&gt;  - Fatih: 1 pulley maker (from Acıçeşme), 1 carpenter (from Samatya)&lt;br&gt;• <strong>Black Sea:</strong> 2 caulkers and 1 carpenter (from the Black Sea in general), 1 caulker and 1 carpenter (from İnebolu), 1 caulker (from Çatalzeytin), 1 carpenter (from Amasra), 1 carpenter (from Araklı)&lt;br&gt;• <strong>Greece:</strong> 3 carpenters (from Chios), 2 carpenters (from Kos), 1 carpenter (with Greek name –Mihalis—but from unknown town)&lt;br&gt;• <strong>Marmara Sea:</strong> 1 carpenter (from Kocaeli, İzmit)&lt;br&gt;• <strong>Other:</strong> 2 lantern makers (Jews)</td>
<td>Birecik</td>
</tr>
<tr>
<td>1728</td>
<td><strong>Istanbul:</strong> head of the corps of carpenters (from Tozkoparan, Güngören), head of the corps of caulkers (from Hacıahmet, Beyoğlu), 2 caulkers (from Eyüp)</td>
<td>Basra</td>
</tr>
<tr>
<td>1730</td>
<td><strong>Azerbaijan:</strong> 8 carpenters (from Ganja)</td>
<td>Basra</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

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Most missions the Imperial Naval Arsenal organized to the region were destined for the Basra Shipyard, where vessels built in Birecik also docked due to their inability to return once dispatched downstream. The Imperial Arsenal’s superintendent sometimes appointed a captain in command of an entire mission but typically divided the mission in groups based on skill (caulking, carpentry, etc.), each headed by its own leader (qalfa, derived from khalifa). On one occasion, men at the Imperial Arsenal dreaded the prospect of a deployment to Iraq. “Baghdad is faraway,” five captains complained in 1706 to their superiors before requesting additional funding for their families and children during their travels.

A look at artisan wages offers some insight into recruitment practices (Table 20). Pay changed with workers’ position and place of residence. Heads of artisan corps were paid about ten to thirty percent more than those serving under them. Artisans coming from nearby towns, such as Maraş, Ayntab, and Diyarbakır, were paid about twenty-five percent less than their peers from more distant locations such as Istanbul or Sidon. Paymasters upheld these standards regardless of workers’ faith. The head of the carpenters’ corps in 1699-1700 was Greek, yet he was still paid more than the Muslim workers under his authority. Likewise, in 1700, two Jewish lantern makers received for their work as much as their Muslim co-workers performing comparable tasks, such as pulley making.

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232 BOA, MAD 7915, p. 276 (15 R 1111/9 October 1699).
233 BOA, MAD 7915, p. 327 (19 L 1117/3 February 1706).
234 BOA, MAD 7915, p. 278 (1111/1699-1700).
235 BOA, MAD 7915, p. 369 (28 B 1111/19 January 1700). The absence of wage discrimination based on religion is noted in the Imperial Arsenal in Istanbul as well. See Çizakça, “The Ottoman Empire,” 219-220.
Table 20. Artisan Wages in the Birecik and Basra Shipyards (Guruş)

<table>
<thead>
<tr>
<th>Position</th>
<th>1699-1701</th>
<th>1708</th>
<th>1728-1730</th>
<th>1734</th>
<th>1744</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head of Carpenters</td>
<td>45/day</td>
<td>-</td>
<td>60/day</td>
<td>60/day</td>
<td>-</td>
</tr>
<tr>
<td>Carpenter (general)</td>
<td>40/day</td>
<td>-</td>
<td>45/day</td>
<td>40/day</td>
<td>-</td>
</tr>
<tr>
<td>Carpenter (local)</td>
<td>30/day</td>
<td>-</td>
<td>-</td>
<td>30/day</td>
<td>-</td>
</tr>
<tr>
<td>Head of Caulkers</td>
<td>50/day</td>
<td>-</td>
<td>60/day</td>
<td>60/day</td>
<td>70/day</td>
</tr>
<tr>
<td>Caulker (general)</td>
<td>45/day</td>
<td>-</td>
<td>45/day</td>
<td>40/day</td>
<td>45/day</td>
</tr>
<tr>
<td>Caulker (local)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30/day</td>
<td>-</td>
</tr>
<tr>
<td>Captain</td>
<td>750/year</td>
<td>750/year</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Head of Pulley Makers</td>
<td>50/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pulley Maker</td>
<td>45/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Head of Shipwrights</td>
<td>45/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shipwright</td>
<td>40/day</td>
<td>-</td>
<td>-</td>
<td>60/day</td>
<td>-</td>
</tr>
<tr>
<td>Tender of Sails</td>
<td>45/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lantern Maker</td>
<td>45/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Blacksmith</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30/day</td>
<td>-</td>
</tr>
<tr>
<td>Logger</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30/day</td>
<td>-</td>
</tr>
<tr>
<td>Steersman</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30/day</td>
<td>-</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

B. Crews

Artisans were a minority in the shipyards. The vast majority were crewmen called levendat, who worked on a seasonal basis and performed menial tasks, mostly oaring and manning ships. When active, each shipyard employed between 400 and 5,000 crewmen. They were among the lowest-paid workers, making in a year nearly what a caulker could make in two days (see Tables 21 and 22). Even the meager pay they received was subject to occasional appropriation by higher officials in Basra, leading many to run away. A crewman was typically placed on a hardtack regimen, whereas janissaries serving in Baghdad frequently received rations of meat. Light and durable, hardtack could easily travel across long distances and maintain its nutritional value to feed large

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236 BOA, AE.SAMD.III 91/9069 (Evail S 1121/12-21 April 1709).
237 For a representative case of meat provisioning for Baghdad’s janissaries, see BOA, C.AS 316/13099 (17 Rajab 1198/6 June 1784).
numbers of workers. Each member of the crew staffing the frigates of Birecik in 1699-1700 was fed 0.5 *vukiyye* (1.5 pounds) of hardtack per day baked in Ayntab and Aleppo.

Table 21. Crews in the Basra Shipyard (Guruş)

<table>
<thead>
<tr>
<th>Year</th>
<th>Size of Crew</th>
<th>Pay/Year</th>
<th>Pay/Person/Year</th>
<th>Pay/Person/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1705</td>
<td>482</td>
<td>40,276</td>
<td>83.56</td>
<td>0.23</td>
</tr>
<tr>
<td>1707</td>
<td>725</td>
<td>59,027.5</td>
<td>81.41</td>
<td>0.22</td>
</tr>
<tr>
<td>1708</td>
<td>500</td>
<td>37,500</td>
<td>75</td>
<td>0.21</td>
</tr>
<tr>
<td>1709-1710</td>
<td>725</td>
<td>59,027.5</td>
<td>81.41</td>
<td>0.22</td>
</tr>
<tr>
<td>1731</td>
<td>500</td>
<td>37,500</td>
<td>75</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Table 22. Crews in the Birecik Shipyard (Guruş)

<table>
<thead>
<tr>
<th>Year</th>
<th>Size of Crew</th>
<th>Pay/Year</th>
<th>Pay/Person/Year</th>
<th>Pay/Person/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700-1701</td>
<td>4,200</td>
<td>272,250</td>
<td>75</td>
<td>0.21</td>
</tr>
<tr>
<td>1744</td>
<td>600</td>
<td>48,000</td>
<td>80</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Like artisans, crewmen tended to be diverse in their composition. In 1709, for instance, seven captains leading individual frigates in the Shatt fleet once served in a similar capacity in the Danubian fleet, two of whom were from Rhodes, one from Crete, and another from Kasımpaşa (Istanbul). In 1731, some 500 men, 200 from Istanbul and 300 to be recruited from the surroundings of Raqqa, Birecik, Süpürgeç, and Diyarbakır, manned Basra’s vessels. Particularly in Birecik, many crewmen were from tribes with no nautical experience, recruited to fill jobs that

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239 BOA, MAD 7915, p. 380 (1111/1699/1700); BOA, MAD 7915, pp. 400-401 (27 N 1113/24 February 1702); D.BŞM.TRE 3/8 (8 L 1111/29 March 1700); BOA, MAD 9885, pp. 295-296 (28 L 1111/18 April 1700). For *vukiyye* conversion, I rely on Halil İnalcık, “Weights and Measures,” in *An Economic and Social History of the Ottoman Empire*, xli.
240 BOA, AE.SAMD.III 173/16926 (29 Z 1120/11 March 1709).
241 BOA, MAD 7915, pp. 350-351 (17 B 1143/26 January 1731).
did not appeal to many. For example, in 1637, to staff 600 ships being built in Birecik, the imperial administration asked officials in the districts of Ana, Haditha, Selimiye, and Deir Rahbe to recruit 400 individuals from among the Arab tribes to serve as oarsmen and steersmen.\footnote{BOA, MD 87, no. 465, p. 144 (1 B 1047/19 November 1637); BOA, MD 87, no. 479, p. 149 (18 N 1047/18 February 1638).} In 1699-1700, Istanbul sought to staff sixty frigates in Birecik with 4,200 fighters and oarsmen, 2,280 of whom to come from the tribes of Ruha, Birecik, Maraş, Ayntab, Aleppo, and Rumkale and the rest from Istanbul. In this occasion at least, tribal crewmen were paid as much as their peers from Istanbul.\footnote{BOA, MAD 7915, p. 273 (2 R 1111/26 September 1699); BOA, MAD 7915, p. 398 (9 B 1113/9 December 1701); BOA, MAD 9885, p. 306 (10 ZA 1111/30 April 1700); BOA, C.BH 149/7106 (2 B 1111/24 December 1699).} For the more distant Basra Shipyard, central authorities frequently asked officials in Aleppo, Diyarbakır, and Baghdad to sentence convicted criminals in their prisons to forced labor in the galleys.\footnote{BOA, MD 5, no. 825, p. 317 (28 C 973/20 January 1566); BOA, MD 5, no. 826, p. 317 (28 C 973/20 January 1566); BOA, MD 22, no. 636, pp. 320-321 (15 CA 981/12 September 1573); BOA, MD 24, no. 228, p. 85 (14 Z 981/6 April 1574); BOA, MD 27, no. 805, p. 336 (3 Z 983/4 March 1576); BOA, MD 53, no. 556, p. 191 (993/1558).} Widespread in the Mediterranean world, the measure was one of the most common forms of punishment Ottoman judges resorted to in all kinds of crimes, from armed robberies, sexual assaults, to selling adulterated bread. It allowed the Ottoman navy to staff its shipyards in Basra, as well as Lepanto, Nauplion, Kavala, and Istanbul at an acceptable cost, and to overcome the perpetual shortage of manpower in the shipyards along the Euphrates.\footnote{Fariba Zarinebaf, \textit{Crime and Punishment in Istanbul, 1700-1800} (Berkeley: University of California Press, 2011), 164-168. For punishment by condemnation to the galleys in the Imperial Arsenal, see Bostan, \textit{Osmanlı Bahriye Teşkilatı}, 213-220; Imber, “The Navy of Süleyman the Magnificent,” 268.}
C. Admiral of the Shatt al-Arab

The highest official in the Ottoman naval bureaucracy was the grand admiral of the Mediterranean fleet (kapudan-ı derya). He was the chief officer of his squadron and of the Imperial Arsenal in Galata and governed coastland areas sometimes confined to Gallipoli but often stretching between North Africa and southeastern Europe, together called the Archipelago (Cezayir). Some regional Ottoman squadrons, such as those at Suez and on the Danube, had their own admirals. Like the Ottoman squadron in Algiers, that of the Shatt lacked a permanent admiralty. Throughout the sixteenth and seventeenth centuries, it remained an ad hoc position, created temporarily to accomplish a particular mission, such as a major military campaign or a shipping order. In 1567, for instance, the imperial administration designated Canbulad Bey, the governor of Kilis and Aʿzaz, as admiral of the squadron joining an expedition against the marsh Arabs. In 1577, one Darende Mahmud received a grant of 8,500 akçe (a small Ottoman silver coin) to serve as admiral on boats transporting timber from Birecik to Basra and Lahsa.

A shift in policy occurred in the aftermath of a lengthy war with the Holy League at the turn of the eighteenth century, when the imperial administration decided to reconstitute its Shatt

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249 Feridun Bey, Nüzhet, 279b-281b.
fleet to deal with a tribal uprising throughout Iraq. In late 1699, it appointed a steward (*kethüda*) of the Danube River named Murad Bey to serve as “the Euphrates’ admiral and steward” (*nehr-i Fırat’a kapudan ve kethüda*) once a new squadron was built.\(^{251}\) For reasons that remain unclear, Istanbul conferred the position six months later upon another person, Aşçızade (Son of the Cook) Mehmed Pasha, who had been admiral of the Danube fleet in Vidin for the past five years.\(^{252}\) From March 1700, Aşçızade’s title in official correspondence became admiral of the Shatt River (*kapudan-i nehr-i Şatt*).\(^{253}\) He distinguished himself in his new post and played a decisive role in restoring Ottoman control over Iraq in the first two years of his appointment.\(^{254}\) He died in 1704 while still serving in his post not only as an admiral but also as governor of Basra, a position he obtained a year before his death.\(^{255}\)

Aşçızade’s impact on the Shatt fleet was more lasting than his four-year tenure as its chief officer. From his appointment onwards, admiralty of the Shatt became an institutionalized position regularly staffed well into the nineteenth century.\(^{256}\) Moreover, Aşçızade’s appointment in 1700

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\(^{251}\) BOA, MAD 7915, 276 (15 R 1111/9 October 1699); BOA, C.BH 90/4305 (18 CA 1111/10 November 1699); BOA, C.BH 149/7106 (15 R 1111/10 October 1699).


\(^{253}\) BOA, IE.BH 7/632 (15 N 1111/6 March 1700); BOA, MAD 9885, pp. 218-219 (23 N 1111/14 March 1700); BOA, MD 111, no. 1194, p. 346 (Evail ZA 1111/11-20 March 1700); BOA, MD 111, no. 1199, p. 351 (Evahir M 1112/8-17 July 1700).


\(^{255}\) BOA, AE.SMST.II 2/171 (12 CA 1115/24 September 1703); BOA, MAD 10306, p. 181 (28 CA 1116/28 September 1704).

\(^{256}\) Aşçızade’s name remained closely associated with the Shatt admiralty after his death. At least two of his successors to occupy the post were close family members. Following his death, Istanbul tapped Aşçızade’s nephew to the post in 1706, a position he held for about six years until he was sacked due to his incompetence and neglect.\(^{256}\) Half a century later in 1763, one of Aşçızade’s grandsons, Salih Bey, was promoted to the post to reform what was at the time a mismanaged fleet. See BOA, C.BH 1/7 (CA 1177/November-December 1763); BOA, AE.SMST.III 297/23775 (24 B 1177/28 January 1764).
facilitated the transfer of naval technology and skills cultivated in the Danube basin, where the Ottoman Empire and its admiralty had experience dating back to the late fifteenth century.\textsuperscript{257} During the first two years of his appointment in the Tigris-Euphrates basin, officials calculated the pay for the Shatt fleet and its personnel based on calculations made for the Danube.\textsuperscript{258} More importantly, it was after Aşçızade’s appointment that Danubian vessels were introduced to the Tigris and Euphrates, including the şayka, işkampoye, and üstüaçık (discussed above).

Admiral of the Shatt was, first and foremost, the highest-ranking military officer operating on the Tigris and Euphrates. An estate list from 1738, belonging to an occupant of the position named Musa Pasha, contains mainly arms and related accessories, including twenty-one arquebuses, seventeen swords, eight pistols, three plate armors, four chains, as well as four rowboats.\textsuperscript{259} Those and many arms were not his property but at his disposal, meant to aid the admiral in his duties, first and foremost to deal with Arab nomads and the threat they posed to the established Ottoman order. An imperial decree appointing a new admiral in 1751 outlined his major responsibilities: implementing the sultan’s will, preventing injustice and oppression, and protecting vessels plying the rivers from nomads.\textsuperscript{260} To these ends, the admiral had to forswear “softness and reconciliation” (rakhawat ve musalehet) and be both “bold and daring” (cesur ve ceri).\textsuperscript{261} On one occasion, an admiral grew too bold and daring and turned against his comrades-

\textsuperscript{258} BOA, IE.BH 10/908 (2 N 1111/21 February 1700).
\textsuperscript{259} BOA, D.BŞM.MHF 12484 (15 ZA 1150/6 March 1738).
\textsuperscript{260} BOA, C.BH 274/12649 (15 RA 1164/21 February 1751).
\textsuperscript{261} BOA, C.BH 1/7 (CA 1177/November-December 1763); BOA, AE.SMST.III 297/23775 (24 B 1177/28 January 1764).
in-arms in Baghdad and his superiors in Istanbul; in 1751, Mustafa Pasha briefly seized Basra in a rebellion that was quickly crushed by Baghdad’s governor, causing the admiral to escape for his life to the Persian port of Bushehr.\textsuperscript{262}

The Shatt admiral’s authority extended from the Persian Gulf to as far north as the rivers could conveniently take him, Baghdad on the Tigris and Hilla on the Euphrates. Within this area, the admiral’s responsibility was not solely to contain the Arab tribal threat but included overseeing the imperial fleet’s budget and distributing the pay of crews.\textsuperscript{263} In addition, according to a British visitor in 1774-1775: “All ships that trade to and from Bussora… pay him [the admiral] a duty per ton on arrival and departure, as do all vessels that trade to and from Bagdad or Helah, or any intermediate place: even the fishing boats pay him so much per month.”\textsuperscript{264}

The Ottoman administration’s ability to assemble all the artisans and crewmen it needed to operate its navy in the Tigris-Euphrates basin was nothing short of extraordinary. The fusion of their knowledge and practical experiences, based on the nautical traditions of the Mediterranean, Danube, Black Sea, and Mesopotamia, brought the software needed to generate a hybrid fleet that proved instrumental in uniting the eastern borderlands through which the rivers flowed. Acquiring the natural resources necessary to assemble the gunboats, the primary hardware of the Ottoman navy, was no less onerous, expensive, and impressive.

\textsuperscript{262} BOA, AE.SMHD.I 214/16914 (7 S 1164/5 January 1751); Kerküklü, \textit{Tarihu Devhatül Vüzera}, 138-140.
\textsuperscript{263} BOA, IE.BH 10/908 (2 N 1111/21 February 1700).
\textsuperscript{264} Abraham Parsons, \textit{Travels in Asia and Africa} (London: Longman, Hurst, Rees, and Orme, 1808), 159.
Natural Resources

A construction project in the shipyards ended the same way it began—with the sacrifice of two animals to the Divine.\textsuperscript{265} They were among a slew of other commodities and valuables that had to be given up for the sake of a gunboat. Above all, boat building in pre-industrial times required massive quantities of timber.\textsuperscript{266} Forests on the Marmara and Black Sea coasts fulfilled the Imperial Naval Arsenal’s demands due to their accessibility to Istanbul by sea.\textsuperscript{267} For Birecik and Basra, the Ottoman administration earmarked landlocked forests in southern Anatolia located within 100 miles of Birecik. Maraş and Malatya supplied most of the timber, but other forested regions around them took part as well, including Rumkale, Ayntab, Andırın, Hısn-ı Mansur (Adıyaman), Elbistan, Behisni (Besni), Gökçemağara, and Süpürgeç.\textsuperscript{268} Their abundant pine groves (çamlık), many privately owned by villages and individuals (koru), attracted Birecik’s naval officers and carpenters alike, who refused to take mulberry wood and insisted that pine is best suited to the construction of riverboats used as platforms for artillery and warriors.\textsuperscript{269}

Documents related to the provisioning of timber to Birecik and Basra abound. Taken together, they reveal a general pattern. Istanbul typically issued an order to authorities in Maraş and Malatya asking them to mobilize carpenters, loggers, and cutlers and send them in detachments

\textsuperscript{265} BOA, D.Şмысл.ŞTE 14598, p. 7 (16 R 1112/26 September 1700). See also Öğüt, Birecik, 268; Orhonlu and İşksal, “Osmanlı Devrinde Nehir Nakliyatı,” 80-83.
\textsuperscript{267} Bostan, Osmanlı Bahriye Teşkilati, 102-118.
\textsuperscript{268} BOA, MD 12, no. 413, p. 195 (10 ZA 978/5 April 1571); BOA, MD 12, no. 431, p. 203 (18 ZA 978/13 April 1571); BOA, C.BH 104/5049 (25 S 1160/8 March 1747).
\textsuperscript{269} BOA, C.BH 193/9048 (1110/1599-1700); BOA, MAD 7915, p. 372 (21 B 1111/12 January 1700). On koru forests, see Selçuk Dursun, “Forest and the State: History of Forestry and Forest Administration in the Ottoman Empire” (Ph.D. diss., Sabancı University, 2007), 335. For a list of the predominant forest trees in the Taurus Mountains in the upper Tigris and Euphrates, see William Ainsworth, Researches in Assyria, Babylonia, and Chaldea (London: John W. Parker, 1838), 24-25.
to different mountain zones where trees are to be felled. Even though pine was their chief target, they tended to add smaller quantities of other types, including oak, elm, nut, and mulberry trees, as well as poplar on one occasion. After the felling, they hired groups of pack animals, several thousands in size and composed of geldings, mules, camels, and oxen to carry the load to different points along the Euphrates’ shores or its upstream tributaries. Rafts and floats would pick up the logs from each spot and transport them downstream to Birecik and, if needed, all the way to Basra. At the shipyard, workers sawed the logs into the needed forms: boards, beams, rudders, keels, masts, oars, and hull floorings, among others. Wages and transport by land and river were the main expenses. To cut trees in private groves, the logging detachment had to pay the property’s owners and obtain their consent.

Like all organic matter, timber decays, and so did wooden vessels. Chief among their natural enemies were fire and worms. In Basra, torrid heat was a particularly destructive influence. A strategy adopted by shipwrights in southern Iraq since the third millennium BC was to import teak from India. They sought teak because of its unique properties; lighter than oak, yet more

270 BOA, MAD 7915, p. 334 (2 Z 1120/12 February 1709); BOA, MAD 5433, p. 19 (10 N 1112/18 February 1701); BOA, C.BH 149/7106 (2 R 1111/27 September 1699); BOA, MAD 9885, p. 130 (4 R 1111/29 September 1699); BOA, C.BH 222/10313 (26 RA 1156/20 May 1743).  
271 BOA, MD 12, no. 413, p. 195 (10 ZA 978/5 April 1571); BOA, MD 12, no. 431, p. 203 (18 ZA 978/13 April 1571).  
272 BOA, MAD 7915, p. 273 (15 R 1111/9 October 1699); BOA, MAD 7915, p. 334 (2 Z 1120/12 February 1709); BOA, C.BH 193/9048 (1110/1699-1700); BOA, AE.SMHD.I 192/14977 (Evahir S 1160/4-13 March 1747). Floats (sal) were cheap devices that cost between three and five guruş in the upper Euphrates. BOA, MAD 5433, p. 9 (10 N 1112/18 February 1701).  
273 BOA, MAD 2775, p. 619 (14 CA 973/7 December 1565); BOA, MAD 7915, p. 334 (2 Z 1120/12 February 1709).  
274 BOA, C.BH 193/9048 (1110/1699-1700). For a useful discussion, see Öğüt, Birecik, 254-261.  
uniform in structure and akin in toughness and durability. Moreover, teak has an oily secretion that repels insects and protects iron fastenings from oxidation and its injurious effects on timber. Basra’s heavy and costly reliance on Indian timber stood out to foreign visitors. Imported teak served both as a principal building material and, more economically, as a reinforcement for decks and vessels made from Anatolian pine. Another measure to check the natural deterioration of pinewood vessels was frequent maintenance. Officials oversaw and financed annual caulking in the Basra Shipyard and numerous restoration projects.

Wood was essential not only as a building material but also, together with coal, as a source of heat for the processing of other raw material, notably iron, used for the manufacture of anchors, nails, hinges, and construction tools such as hammers. The Anatolian towns of Adana and Maraş supplied raw iron delivered by camels to blacksmiths in Birecik, where they smelted it for use locally and in Basra. A document dated to 1700 takes us inside one of Birecik’s forges, housed

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Times (Princeton: Princeton University Press, 1995), 90-91. Other Indian Ocean ports imported teak from India as well. For the use of teak in the Suez Shipyard, see Mikhail, Nature and Empire, 121-122.


279 For a representative group of cases, see Table 14; BOA, MD 10, no. 421, p. 270 (28 B 979/16 December 1571); BOA, MAD 7915, p. 350 (4 Ş 1143/11 February 1731).


281 For iron from Adana, see BOA, MAD 9885, p. 131 (7 R 1111/1 October 1699), p. 204 (12 N 1111/3 March 1700), p. 240 (4 L 1111/25 March 1700), p. 262 (16 L 1111/6 April 1700); MAD 7915, p. 376 (9 B 1111/31 December 1699), p. 392 (10 N 1112/18 February 1701); BOA, ÎE.BH
in an abandoned cave. It contained a cistern for holding tar, coal sacks made of haircloth, two water jars, drain pipes, a furnace, and an anvil. In some instances, shipyard brokers relied on third parties to meet the demand for iron. In 1743, they resorted to a Kurdish tribe near Birecik renowned for its practice of smelting iron on coal flames to make nails.

Caulking consumed a number of resources. The use of sheep and goat hides and oakum was common. Caulkers processed raw tar in copper cauldrons to obtain melted pitch, which they poured on the cracks between boards after inserting the fillers. Early in the sixteenth century, the imperial administration secured tar for Birecik from Rhodes and Kos. Another source of tar in the region was Hit, a Euphrates town (modern-day northwestern Iraq) vividly described by sixteenth-century travelers. Ottoman officers in 1565 complained that “man’s nose cannot breathe” because of the rotting smell of tar and sulfur around the town. Ralph Fitch, a London merchant visiting in 1583, wrote: “In a fielde neere unto it, is a strange thing to see: a mouth that doth continually throwe foorth against the ayre boyling pitch with a filthy smoke: which pitch doth runne abroad into a great fielde which is alwayes full thereof. The Moores say that it is the mouth of hell. By reason of the great quantitie of it, the men of that countrey doe pitch their boates two

10/914 (12 N 1111/3 March 1700). For iron from Maraş, see BOA, MD 27, no. 748, p. 315 (6 Z 983/7 March 1576), no. 752, p. 316 (6 Z 983/7 March 1576).
282 BOA, D.BŞM.TRE 14598, p. 2 (16 R 1112/26 September 1700).
283 BOA, MAD 9947, p. 375 (15 N 1156/2 November 1743).
284 For references to the use of animal hides in caulking, see BOA, D.BŞM.TRE 14598, p. 1 (16 R 1112/26 September 1700); BOA, C.AS 922/39875 (Evahir Z 1146/25 May-4 June 1734); BOA, MAD 5433, p. 4 (6 N 1112/14 February 1701). For references to oakum, see BOA, D.BŞM.TRE 14598, p. 1 (16 R 1112/26 September 1700); BOA, MAD 5433, p. 18 (6 N 1112/14 February 1701).
286 BOA, MD 3, no. 751, p. 259 (5 CA 967/2 February 1560).
287 Feridun Bey, Nüzhet, 286b.
or three inches thicke on the out side, so that no water doth enter into them.”

Despite the great benefits of Hit’s tar deposits, another London merchant in 1581 noted: “Divers Camels have fallen into these Springs, but none of them could be saved.”

On several occasions, the construction superintendent or one of his deputies did not obtain any of the necessary items from their original source. Be it nails, pitch, awning, hawser, coal, or sail cloth, they instead purchased them from nearby cities at market price. Since the sixteenth century, Aleppo had been the primary destination for shipyard brokers and occupied the role of the Ottoman navy’s marketplace in the east.

Through a shifting combination of imperial commands and trust in the marketplace, Ottoman officials mobilized the natural resources of broad regions to keep the Tigris-Euphrates shipyards supplied with material necessities required for the sustained projection of power in the drainage basin. In its central features, the system for supplying timber, pitch, and so forth was similar to the system in use for supplying carpenters and crewmen. Gunboats of the Shatt fleet, in many respects, embodied the ecological and human diversity of the Ottoman Empire.

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288 J. Horton Ryley, *Ralph Fitch, England’s Pioneer to India and Burma; His Companions and Contemporaries, with His Remarkable Narrative Told in His Own Words* (London: T. F. Unwin, 1899), 52-53.

289 John Newberie, “Two Voyages of Master John Newberie, One into the Holy Land; The Other to Balsara, Ormus, Persia, and Backe Thorow Turkie,” in *Hakluytus Posthumus; or, Purchas His Pilgrimes: Contayning a History of the World in Sea Voyages and Lande Travells by Englishmen and Others*, ed. Samuel Purchas (Glasgow: James MacLehose and Sons, 1905), 8:453.

290 “Hükümmname Mecmuasi,” ff. 340b-341a (10 Ș 959/1 August 1552); BOA, MD 27, no. 436, p. 191 (9 L 983/11 January 1576), no. 465, p. 202 (15 L 983/17 January 1576); BOA, MAD 7915, p. 275 (12 R 1111/6 October 1699), p. 344 (24 S 1123/13 April 1711); BOA, C.AS 922/39875 (Evahir Z 1146/25 May–4 June 1734); BOA, C.BH 66/3118 (20 CA 1160/30 May 1747); BOA, C.BH 83/3978 (6 Ș 1156/25 September 1743).
Finance

Early in the sixteenth century, the Imperial Treasury financed boat building projects in Birecik and Basra through its finance director (defterdar) in Aleppo, who looked after the financial affairs of remote Asian provinces.\(^{291}\) When funds were needed, he received a letter from Istanbul instructing him to provide money and material to the person designated to oversee the construction.\(^{292}\) As instructed, he kept records of all money transferred and expenses incurred in a register and handed it over to Aleppo’s governor, who had to dispatch it back to Istanbul.\(^{293}\)

Imperial and global transformations in the latter half of the sixteenth century caused a restructuring in the finances of Ottoman institutions. Population growth, urbanization, and commercialization of the rural economy, coupled with the influx of bullion from the Americas, caused a significant increase in the use of money and the prices of food and raw materials.\(^{294}\) In addition, following its long war with the Habsburgs between 1593 and 1606, the Ottoman Empire initiated a major overhaul in its military establishment, phasing out its traditional cavalry corps (sipahi), as well as the land grants supporting them, and expanding the number of musket-wielding foot soldiers paid in cash through the central treasury.\(^{295}\) Together, these economic and military

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\(^{291}\) İnalçık, “The Ottoman State,” 77-88; Encyclopaedia of Islam, 2nd ed. (Leiden: Brill Online, 2016), s.v. “Daftardar” (Bernard Lewis).

\(^{292}\) See, for example, BOA, MAD 2775, p. 116 (18 M 973/15 August 1565).

\(^{293}\) “Hükümanme Mecmuası,” fol. 340b (10 Ş 959/1 August 1552).


transformations caused an upward spiral in the demand for ready funds, which Ottoman tax officials sought to secure through three categories of state revenue: the poll tax on non-Muslims (cizye), extraordinary levies (avarız), and short-term tax contracts for the collection of different revenue sources (e.g., iltizam, mukata’a, and havale).296

As they came to finance the Ottoman state in the seventeenth century, these sources of cash funds, collected from Belgrade to Basra, would replace the Imperial Treasury and its provincial branches in financing the Shatt fleet.297 A payment made in February 1701 best illustrates the new financial arrangement.298 To pay the wages and provisions of a 4,200-strong crew stationed in Birecik for a six-month period, central authorities allocated eleven different cash funds in the form of tax farms, extraordinary levies, poll-taxes on non-Muslims, and other taxes from Tripoli (modern-day Lebanon), Sidon, Beirut, Adana, Aleppo, Maraş, Gümüşhane, Erzurum, and Sivas. Two chamberlains at the Ottoman court (ser-i bevvabin), Eyüp Ağa and Mustafa Ağa, were delegated to collect all those funds and later transfer them to Baghdad for the city’s officials to administer.

A similar arrangement existed to finance the crews of the Basra fleet and its repair and maintenance. However, in this case, the cash funds were smaller in number, collected only from districts within Basra itself, and apparently allocated on a long-term or permanent basis.299 These few nuances may explain why the financial arrangement in Basra was referred to in official records

298 BOA, IE.BH 11/952 (10 N 1112/18 February 1701); BOA, MAD 7915, p. 385 (10 N 1112/18 February 1701); BOA, MAD 1168, p. 18 (8 L 1112/18 March 1701).
299 BOA, MAD 7915, p. 414 (16 M 1115/1 June 1703); BOA, MAD 10151, p. 160 (21 CA 1119/19 August 1707).
as **ocaklık**, a system of revenue assignment frequently applied to support dockyards, stables, and other imperial enterprises.\(^{300}\)

**Crisis**

In May 1777, during the Zand occupation of Basra, a chamberlain at the Ottoman court dispatched a letter to Baghdad’s governor to vent his frustration over the lack of support he found in Birecik. None of the necessary material for construction was available in the shipyard. Timber from Maraş, Elbistan, Behisni, and Ayntab did not arrive, nor did the needed provisions from Aleppo and Raqqa. He had to purchase timber from the market at a high price, with which he constructed a mere twenty vessels. Had he had the necessary timber and provisions, he claimed he could have constructed and loaded 150 vessels to be dispatched to Baghdad. “By God I am bewildered!” (*alimallah müteheyyir kalmıştım*), he grumbled, helpless to change a bitter reality.\(^{301}\)

The chamberlain’s letter is one of the last records of an Ottoman attempt to build gunboats on the Tigris and Euphrates. By the 1770s, Istanbul was no longer able to provision its eastern naval bases, nor was it able to meet the exigencies of its debilitating wars in eastern Europe without the goodwill of independent local grandees in the provinces. A few years later, the Ottoman Empire ceased all naval production operations in Birecik and Basra and relied instead on ships called up and imported from foreign shipyards. A modest squadron remained in the waters of Iraq under the command of Baghdad’s governor and Basra’s admiral but with virtually no ties with the Imperial Naval Arsenal in Istanbul.


\(^{301}\) BOA, HAT 6/212 (23 R 1191/31 May 1777).
The breakdown in Ottoman military logistics, once the envy of Europe, was most visible during the Russo-Ottoman War of 1768-1774, a humiliating defeat that cost the Ottoman army tens of thousands of lives and its entire Mediterranean fleet in the bay of Çeşme. Many perished in the crossfire, but countless others died from famine and malnutrition caused by confusion and disorder in the supply system.\textsuperscript{302} The Birecik Shipyard was both far from Istanbul’s main war theater and prohibitively expensive to maintain. As early as 1701, Ottoman officials complained that building a frigate in Birecik was about 40 percent costlier than building it in Istanbul due to the land route that separates the town from forests and the need to procure most labor and construction material from out of town.\textsuperscript{303} The costs became more unaffordable and unwarranted than ever in the late eighteenth century when the imperial administration had to focus its resources and energies on fighting Russia, reforming its land and naval forces along Western lines, and relieving a strained central treasury, a crisis that prompted deliberations over raising a foreign loan for the first time in Ottoman history.\textsuperscript{304} The change in priorities is best illustrated in Istanbul’s decision to assign a number of Baghdad’s tax farms in the early nineteenth century to support not the Shatt fleet but rather that of the Danube.\textsuperscript{305}


\textsuperscript{303} BOA, MAD 7915, p. 393 (10 N 1112/18 February 1701); BOA, MAD 5433 (6 N 1112/14 February 1701).


\textsuperscript{305} BOA, C.BH 115/5553 (16 L 1234/8 August 1819); BOA, C.BH 155/7387 (28 Safar 1233/7 January 1818); BOA, C.BH 191/8950 (22 RA 1236/28 December 1820).
Amid the mounting political and financial pressures of the late eighteenth century that crippled its war machine, the central administration resorted to the naval production capabilities of three ascending maritime powers in the Persian Gulf to supplement its debilitated Shatt fleet. One was the Shi‘i Arab tribe of Banu Ka‘b, which built a power base in Khuzistan, the southern borderland region between Iraq and Persia, following the collapse of the Safavid Empire in 1722. At the zenith of their power in the 1760s, the Banu Ka‘b expanded their control to the mouth of the Shatt al-Arab and established a formidable fleet of about eighty boats, larger than the Ottoman fleet in the region at the time. The Banu Ka‘b’s navy posed a major military threat to Ottoman authorities in Iraq and even destroyed the house of Basra’s admiral and much of his fleet in 1773. Nevertheless, as with all Arab tribes in the region, Ottoman authorities had a fluid relationship with the Banu Ka‘b and solicited their naval support during a campaign waged by the deputy of Basra against the Muntafiq tribe in 1769, during which the Banu Ka‘b provided a fleet of fourteen gallivats.

The second maritime power to occasionally serve as an auxiliary for the Shatt fleet was that of the Imam of Oman, Ahmad ibn Sa‘id. Two years after the death of Nadir Shah in 1747, Ahmad expelled a Persian occupation force and founded the Al Bu Sa‘id Dynasty, which has ever since ruled the country. During his reign, a considerable portion of the Persian Gulf trade shifted to Oman due to the political unrest in Basra and Persia and the abandonment of the British factory in Bandar Abbas. The commercial realignment made Oman an attractive destination to foreign merchants and allowed Omani merchants to build a fortune through the export of Mocha coffee.

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306 IOR/G/29/21, Henry Moore to the Court of Directors, ff. 1a-4b (16 January 1774), especially fol. 1b.
and the transport of Batavian products to the Persian Gulf and western Indian Ocean. Around 1775, the fleet owned by Oman’s Imam comprised four ships of forty guns each, twenty-five ketches and gallivats of eight to fourteen guns each, and a large yet unspecified number of dhows and trankies. During the Persian siege of Basra by the Zands in 1775, Ottoman officials in Iraq wrote to the Imam of Oman asking for his naval support to relieve the city. He dispatched a fleet of some thirty ships under the command of his two sons. The fleet broke the blockade on Basra and offered limited relief after a long involvement with Persian forces that exhausted the fleet’s provisions. Nevertheless, Abdülhamid I (r. 1774-1789) appreciated Oman’s aid and expressed his gratitude in a letter to its Imam.308

The third and most consequential maritime power was the British East India Company. During intervals since the seventeenth century, it maintained a factory and resident in Basra, importing metal ware and woolens and bartering them for cash and Persian silk. First set ablaze by a French corsair and then involved in a bloody skirmish with the khan of Lar, the Company’s factory in Bandar Abbas was evacuated and moved to Basra in 1763, where its representative was promoted from resident to agent and strengthened by the grant of consular status.309 Ottoman authorities in Iraq immediately started to enlist the naval support of the Company’s agents in their conflicts with domestic and foreign enemies. In one campaign against the Banu Ka’b in 1765, for instance, the Company contributed a private vessel to the Ottoman army and recruited two young Englishmen to command two vessels in the Ottoman squadron. In 1775 during the Zand siege of

309 The promotion, according to a British historian, was to protect the East India Company in Iraq from “the jealous bickering of the Frenchman.” Stephen Longrigg, Four Centuries of Modern Iraq (Oxford: Oxford University Press, 1925), 188. See also IOR/L/P&S/20/C236, Jerome A. Saldanha, “Précis of Turkish Arabia Affairs, 1801-1905,” ff. 57r-64r.
Basra, British commanders took charge of two gallivats in the Ottoman squadron, each carrying eight guns and eighty to a hundred men, and hoisted British flags.\textsuperscript{310}

Aside from hiring vessels out and providing mercenaries, the East India Company sold to Ottoman authorities in Iraq brand new ships built by the Bombay Presidency. In 1773, its agent sold two ketches.\textsuperscript{311} Another order was placed in 1780, after Baghdad’s governor pleaded to Istanbul early in the year that he needed ten new vessels with six guns each to regain territories he lost to Arab tribesmen. He said one “Pablus” could oversee and complete the construction in Bombay within six months and asked the imperial administration to make the payment to the British ambassador in Istanbul or to the consul in Aleppo.\textsuperscript{312} Istanbul and Baghdad ended up purchasing six armed gallivats, which the Company’s agent delivered to Baghdad’s governor in 1782 and 1783.\textsuperscript{313} After the Wahhabi sack of the holy city of Karbala, Baghdad’s governor asked the central administration in 1802 to order more gunboats from the Bombay Presidency to repel further Wahhabi encroachments.\textsuperscript{314} The British resident in Baghdad, in a letter to the ambassador in Istanbul, supported the request, but there is no indication that the order was fulfilled.\textsuperscript{315}

The East India Company supported the Ottoman Empire in Iraq with its vessels and crews for different reasons. The Ottomans’ Arab and Persian enemies often constituted a direct threat to the Company’s commercial interests in the area. Even when its interests were not directly at stake,

\textsuperscript{310} IOR/L/P&S/20/C91/1, John Gordon Lorimer, “Gazetteer of the Persian Gulf, ‘Oman, and Central Arabia,” 1219, 1252-1257.
\textsuperscript{311} IOR/G/29/21, Henry Moore to the Court of Directors, fol. 1b (16 January 1774); Risso, Oman and Muscat, 89.
\textsuperscript{312} BOA, C.BH 68/3245 (9 RA 1194/15 March 1780); BOA, C.BH 230/10714 (9 RA 1194/15 March 1780); BOA, BŞM.BSH 3/106 (19 S 1194/25 February 1780). See also IOR/G/29/21, William D. Latouche to the Court of Directors, ff. 388a-390a (5 December 1780).
\textsuperscript{313} Saldanha, “Précis,” fol. 49v; Lorimer, “Gazetteer,” 1278.
\textsuperscript{314} BOA, HAT 93/3799 (17 M 1217/20 May 1802); BOA, HAT 241/13544 (n.d.).
agreements over pay and prizes for an intervention seemed attractive. The calculation radically changed when the Ottoman and Qajar dynasties were shaken by Napoleon’s invasion of Egypt in 1798 and Russia’s annexation of Georgia soon after, developments that Britain considered a threat to its position in India. Supporting the Ottomans and Qajars against their European rivals henceforward became an official British policy. Naval assistance aside, the East India Company began arming Ottoman forces in Iraq with mortars, shells, muskets, gunpowder, and other munitions of war and sent European bombardiers and gunners trained in the military service of the Company in India to serve in the army of Baghdad’s governor.\footnote{316}{Castlereagh, \textit{Correspondence}, 175-176, 185-188; Saldanha, “Précis,” fol. 56r.}

To sum up, political and financial crises and the arrival of three naval contractors near the shores of Basra during the late eighteenth century brought an end to an expensive naval industry in the region. Hiring or restocking with gunboats from foreign shipyards became more convenient and preferable than constructing them locally from scratch. The Ottoman naval sector’s dependence on foreign arms imports became more entrenched during the nineteenth century, when iron became the primary shipbuilding material and the steam engine replaced wind and human muscles as the primary means of propulsion.

\textit{Conclusion}

To paraphrase a renowned maritime archaeologist, the Ottoman gunboat was the largest and most complex machine in the early modern Tigris-Euphrates basin.\footnote{317}{Keith Muckelroy, \textit{Maritime Archaeology} (New York: Cambridge University Press, 1978), 3.} Putting it together was a capital-intensive enterprise that depended on the sophistication of a political administration, the goodwill of a subject population, and the bounties of nature. In tandem with the Ottoman gunboat’s
introduction and loss of influence between the sixteenth and eighteenth centuries, elaborate systems of finance, labor recruitment, and resource extraction rose and fell to meet the onerous demands and expectations of a Mediterranean power. Developing and sustaining production capabilities represented a major investment only a power like Istanbul could make, from which it received substantial returns. Gunboats creatively exploited the energy of wind and water flows to facilitate a more intensive marshaling of resources and to bring the explosive power of gunpowder to bear on rivals along the far-flung eastern borderlands.
PART II: THE WATER WIDE WEB

Territorial control through militarized fortresses and boats entailed control over land and its organic wealth. Within the Tigris-Euphrates basin, the southern alluvial plain was Istanbul’s agricultural crown jewel. The twin rivers mattered more to food production in this micro-region than anywhere else for three reasons. First, the alluvial lowlands made the river channels easier to manipulate and divide into small irrigation canals, through which flow could be led down the levee slopes to meet the needs of crops and forage. The rolling configurations of the northern plains, on the other hand, placed major hurdles to the construction of cross-country canals, an arduous endeavor only a few cruel and high-handed kings could pull off. Second, scanty and extremely variable rainfall in the arid south, falling below the 200-mm isohyet, forced farmers to depend more heavily on the Tigris and Euphrates, the wholesale distributors of water in the region. In the north, meanwhile, farming did not require river waters thanks to winter rains. Increasing in a north-easterly direction, annual precipitation reaches over 500 mm east of Mosul and offers a generous and reliable basis for dry-farming (see Figure 22). Lastly, only in the alluvium does the Tigris-Euphrates flood factor come into the equation. Once they reach this flat zone, the rivers break free from the steep cliffs that confine them upstream and become prone to flooding and movement, depositing and scattering around most of the rocks they scoured in the north. The annual flood and deposition of sediment sorted the land surface into marshes, levees, basins, and pastures and

created the entire alluvial landscape on which Mesopotamian history unfolded. Endowed with a suitable gradient for canal construction, without reliable rainfall, and liable to recurrent flooding, the alluvium over a span of more than six millennia was the focal point for most water management activity, until twentieth-century states acquired the diesel pumps and fossil fuel subsidies necessary to exploit the rivers’ headwaters in Anatolia and Syria.\(^{320}\)

Figure 22. Precipitation Levels in the Tigris-Euphrates Basin (mm)


In short, the Iraqi alluvial plain owed much of its physical character and living content to the work of the Tigris-Euphrates system. The following three chapters focus on three major biotic

provinces arranged by fluvial action: arable lands, grasslands, and wetlands. Each ecological zone harbored a unique community of plants and animals as permanent residents and welcomed visitors that stayed for only part of the year. From a bird’s-eye view, the rivers created in the alluvium what I call a Water Wide Web, a hydraulic network connecting farmers, pastoralists, and marsh dwellers through which they shared resources and information and enhanced the nutritional aggregate available to them. The Water Wide Web spread risks by expanding the spectrum of subsistence options and conferred greater capacity to adapt to profound and unexpected perturbations in the political and natural environments than possible under a mono-cultural system. As a framework, the Web concept widens the lens of inquiry and breaks free from the view that the alluvium was a uniform expanse of desert waste, highlighting instead ecological diversity and the success of human opportunism and ingenuity in integrating arid and wet zones along with arable areas into systems of production.

The central contention of Part II is that a relatively new biological hierarchy, fostered by political instability and violence in the previous three centuries, became entrenched in the Iraqi alluvium under early modern Ottoman rule. Wheat and barley, the region’s two principal grain crops for most of Mesopotamian history, remained biological giants but no longer enjoyed their former unassailable hegemony (see Table 23). A newcomer, rice, was more profitable than both in the late sixteenth century, and date palm was not far behind wheat, despite the fact that the latter was the highest crop in value per unit volume. Adding insult to injury were ascendant ungulates

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321 For a background to environmental conditions in the region before the Ottoman conquest in the sixteenth century, see Muhammad Rashid al-Feel, The Historical Geography of Iraq between the Mongolian and Ottoman Conquests, 1258-1534 (Najaf: al-Adab Press, 1965); Robert McC. Adams, “Historic Patterns of Mesopotamian Irrigation Agriculture,” in Irrigation’s Impact on Society, ed. Robert McC. Adams, Theodore E. Downing, and McGuire Gibson (Tucson: University of Arizona Press, 1974), 1-5.
that, as a group, became serious challengers to wheat. For a combination of reasons explained in Chapter 3, the Ottoman administration did not seek to fundamentally alter the balance of power between the plants and animals of Iraq with large scale and permanent irrigation works. Instead, it focused on profiting from the alluvium’s organic endowment by digging deeper into the resources of every biome, while offering entrepreneurs incentives to expand cultivation in small increments. Allocating investments among various ecological zones allowed Istanbul to manage risk and weather the volatility of the eastern frontier. The negative performance of arable lands in one year due to an extraordinary flood or pastoral raid, for instance, could be neutralized by the performance of wetlands and grasslands that come through the same perils unscathed. In some respects, the Water Wide Web that helped hold the Ottoman Empire in the Tigris-Euphrates alluvium resembled the “vertical archipelago” of the Andes. Farming at different elevations in the mountain system produced complementary crops that provided the Inca Empire with insurance against disaster.322

Table 23. Major Plants and Animals in the Alluvium, 1580-1590

<table>
<thead>
<tr>
<th>Item</th>
<th>Tax Potential (akçe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>3,618,388</td>
</tr>
<tr>
<td>Barley</td>
<td>3,420,770</td>
</tr>
<tr>
<td>Wheat</td>
<td>2,630,609</td>
</tr>
<tr>
<td>Date Palm</td>
<td>2,363,377</td>
</tr>
<tr>
<td>Caprids (Sheep and Goat)</td>
<td>1,403,543</td>
</tr>
<tr>
<td>Water Buffalo</td>
<td>812,913</td>
</tr>
<tr>
<td>Cow</td>
<td>198,483</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Different hydrologic conditions within the alluvial plain created different opportunities and challenges. As far as the sources permit, I will elucidate those most prevalent in every biome and the strategies the local inhabitants developed to cope with them. Disease, for example, features in my discussion about wetlands, where it was a rampant nuisance. Likewise, hydraulic engineering, a prerequisite for crop cultivation in basin landforms, is a major topic in Chapter 3, where I examine arable lands. Their differences notwithstanding, ecologies of the alluvial plain—arable, dry, and wet—formed a seamless tapestry, stitched into each other through the seasonal rise and fall of the Tigris and Euphrates.
Chapter 3: Arable Lands

“Si le paradis terrestre était ici comme on le prétend, Adam devait s’y trouver passablement bien.”


Far from the tempering influence of oceans or mountains, the lower Tigris and Euphrates maintained near monopoly power over life’s most precious commodity—water—and were the ultimate brokers of virtually every agrarian enterprise on the alluvial plain. Those who wished to grow crops and settle could not sustain their way of life without river water, which came at a high price in a closed marketplace. The price was greater vulnerability and fewer protections from the predatory acts of the Tigris and Euphrates, including late spring floods, clogged canals, salinized soils, and unstable channels. Without alternative sources of water, grain farmers had to succumb to the mischief of both rivers, find other means of earning a living, or leave.

Between the sixteenth and eighteenth centuries, tens of thousands of farmers stayed and battled on. This chapter pieces together the early modern agrarian order in the alluvial plain and its strategies to overcome the chronic instabilities of the Tigris-Euphrates regime. Two features predominated in the irrigation pattern upheld by the Ottoman administration: the use of lifting devices and the construction of short lateral canals. The emphasis on these homespun, age-old schemes allowed arable cells fed by the rivers to sustain themselves independently through basic social and institutional arrangements based on family ties and shared local interests. Operating haphazardly without the coordination or capital investment of a state bureaucracy, agricultural communities collectively were less effective in the utilization of water and land but exceptionally robust in their high-risk environment. Their fortunes largely untied to those of the dominant power,
they enjoyed greater immunity to the political as well as ecological vicissitudes of the early modern era.

The colossal canal projects for which Mesopotamia was once famous were now rare. Only a few traces of antiquity’s large waterworks survived beyond the sixteenth century. Scholars have often confused the disappearance of most great canals, the best documented in written sources and archaeological ruins, with the virtual disappearance of irrigation systems more generally. This chapter demonstrates that irrigation systems in the alluvial plain never actually vanished but rather persisted in a different form, less grandiose though that may have been. Compared to that of antiquity and the early Middle Ages, the early modern irrigation configuration was technologically crude and geographically restricted, yet less fragile and more environmentally sustainable.

**Imperial Imperatives**

The Ottoman Empire had to reconcile three imperatives to determine the degree to which it managed the alluvial plain’s hydrological commons. The first was a cultural attitude, dubbed


“traditionalism” by the historian Mehmet Genç, that cherished the status quo and resisted innovation. A traditional posture called for Ottoman intervention in water management to fulfill the sacred duty of following the example of ancient empires and thus preserving the “natural” order of things. Ottoman legal codes and authors frequently invoked the doctrine of precedent when issues of irrigation were under consideration, prefaced by conventional phrases such as: “from old times” (*kadim-ül-eyyamdan*), “in the times of former sultans” (*salatin-i maziye zamanlarında*), and “according to ancient custom” (*adet-i kadime üzerе*). A comment by Evliya Çelebi during his visit to Baghdad in 1656 encapsulates the traditionalist sentiment, claiming that a canal project recently undertaken by the governor had made “the land of Iraq more prosperous than it was in the age of the caliphs.” Like mosques and shrines, irrigation works buttressed Istanbul’s legitimacy in the river valley by creating a smooth lineage between the glorious past and the Ottoman present.

In a diligent effort to preserve Mesopotamia’s legacy in water management, the Ottoman administration recruited two longstanding corps of hydraulic engineers, whose deep roots, service to ancient rulers, and new terms of employment were highlighted in the law codes of Süleyman I and Murad III (r. 1574-1595). Members of the first corps had the title of *sekkar* and were deployed

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326 TKG.KK, TT 29, ff. 6a-b. For a detailed analysis of the “viscosity of precedent” in Ottoman Egypt, see Alan Mikhail, *Nature and Empire in Ottoman Egypt: An Environmental History* (New York: Cambridge University Press, 2011), 52-58.
in the Diyala region northeast of Baghdad. Their job was twofold: to excavate and clear canals three to four times a year and to repair dams and breaches in riverbanks. In return for their continued labor, the Ottoman finance director (defterdar) of Baghdad gave each one of them a document called temessük that entitled them to a percentage of the harvest in the district where they served.\textsuperscript{329} Members of the second corps of hydraulic engineers were called karikh, who specialized in gravity-flow irrigation and were deployed more widely throughout the Baghdad province, reportedly in every single village.\textsuperscript{330} They received tax exemptions on the harvest they cultivated for their service.\textsuperscript{331} Both the sekkar and karikh corps remained integral parts of the provincial bureaucracy well into the middle of the nineteenth century, when an Ottoman official visiting Baghdad encountered them and defined their titles to his Turkish readers as suları bend edeci (confiner of the waters) and su taksımcısı (water distributor), respectively.\textsuperscript{332}

Esteem for the status quo, therefore, steered the Ottoman Empire towards an active approach to water management, but restrained ventures to revamp irrigation in the alluvial plain. The desire to preserve preexisting facilities and arrangements took precedence over the potential rewards of transforming them. To kick-start the traditionalist agenda in the region, a judge named Kadızade Sheikh Mehmed compiled a report commissioned by Süleyman I detailing “the laws and rules governing the population in the past during the reign of former sultans known for exercising

\textsuperscript{329} BOA, TT 1028, p. 5; TKG.KK, TT 29, ff. 6a-b, 51a, 78a, 87a, 121a; “Kanunname Mecmuası,” Bayezid Kütüphanesi, Istanbul, Veliyüddin Efendi MSS 1970, ff. 105a-b.
\textsuperscript{330} On the karikh in charge of Husayniyya River in Karbala, see BOA, D.BŞM.BGH 4/57 (10 C 1196/23 May 1782).
\textsuperscript{331} “Kanunname Mecmuası,” ff. 105a-b.
Based on the report’s findings, Süleyman formulated his first law code for Baghdad in 1537, in which he declared his intentions to uphold the rules and customs that governed the province until the reign of Uzun Hasan (r. 1453-1478), leader of the Türkman Akkoyunlu Dynasty. “Innovations” (bidatlar) introduced by the Shi’i Safavids, Baghdadis in all gathering places had to hear out loud, were hereafter null and void.

The second imperative for Ottoman hydraulic management in the alluvial plain was what the writer Kinalizade Ali Çelebi (d. 1572) first called the “Circle of Justice” (daire-i ‘adliyye), a concept of state comparable to the Chinese Mandate of Heaven that provided a model for good government in the Middle East since ancient times. For the Ottoman Empire in particular, the Circle of Justice was “a foundational element” in its political ideology. A shorthand version of it states: “No power without troops, no troops without money, no money without prosperity, and no prosperity without justice and good administration.” Seen within this concept, irrigation agriculture, as a major source of wealth in a fluvial environment, had a higher moral purpose beyond personal enrichment; it empowered the Muslim sovereign to protect his realm, dispense justice, and legitimate his rule.

Consequently, the prevalent political theory made the Ottoman sultan ultimately responsible for the welfare of the peasants and their irrigation needs. This sense of royal duty was on full display during the reign of Süleyman I, who portrayed himself as the restorer of justice and prosperity in Iraq after what he decried as a Safavid dark age dominated by the “Qizilbash rabble”

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333 “Sinin maziyede salatin adalet ayin devirlerinde reaya ve berayaya mukarrar olan qava’id ve qavanin.” “Kanunname Mecmuasi,” ff. 104a-b.
One of his most important reforms pertained to lands owned by the state (miri), leaving privately owned properties (malikane) in the hands of their owners. In a proclamation issued around 1540, he wanted subjects to know that Baghdad was open for agrarian enterprise, writing: “Whoever comes and irrigates desolate and vacant lands to bring them under cultivation will be exempted [from taxation] for three years,” an extension to the one-year exemption he had initially offered a few years earlier. The Imperial Council asked provincial authorities on behalf of Süleyman to search in particular for people willing to reclaim canals that had been abandoned and left to ruin (khalı ve kharab). To those who responded positively, the administration awarded possession (tasarruf) and usufruct (istīghlāl) rights but retained eminent domain (rakaba). The bargain, available to farmers in Baghdad and Basra through an arrangement called the tapulama (leasing under tapu), conferred privileges on land owners that ordinary tenants lacked, including transfer and heritable rights and security of tenure as long as contract conditions were observed. Soon after ascending the throne, Selim II (r. 1566-1574) added an important element to his father’s reforms by lowering the annual tax (bedel) on harvests in the Basra province from one-third to one-fifth.

Tax breaks and a favorable legal framework for private landholding made agricultural development in the alluvium an attractive investment. Basra gives the clearest signal of growth in arable production during the early phase of Ottoman rule, witnessing between 1550 and 1590 an upsurge in the tax revenue estimates for date palm (80%), rice (55%), wheat (30%), and barley

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339 BOA, MD 22, no. 9, pp. 3-4 (17 M 981/19 May 1573). See also BOA, MD 22, no. 278, p. 139 (10 S 981/10 June 1573).
340 BOA, MD 7, no. 375, p. 147 (10 CA 975/11 November 1567).
(10%) (Tables 24 and 25). Baghdad has only one surviving detailed cadaster (*mufassal defteri*) and lacks the data necessary to calculate agricultural trends during the same period. Nonetheless, the positive response to Ottoman incentives can be inferred from forty extant cases of land reclamation both in Baghdad and Basra between 1550 and 1590, which spell out how officials applied Süleyman’s policies on the ground. In all cases, individuals interested in reviving a particular canal or wasteland had first to obtain a *tapu* (a title deed) from the local treasury for a lump sum payment. The acquisition occurred either by formal application (*talep*) or through an auction (*mazad*) that granted the *tapu* to the highest bidder. Once the *tapu* was secured, the *tapu*-holder began reclamation work with his own men and capital (*kendü mal ve rical ile*) and paid the state a percentage of his annual harvest called *vacib-i divaniyyesi*, after which he received a document called *temellük* confirming his ownership. Both the statistical data on crop revenues and the anecdotal evidence of canal and land reclamation attest to the tangible results of Ottoman agrarian reforms.

Table 24. Tax Revenue Estimates on Major Crops in Basra, 1552-1590 (Akçe)

<table>
<thead>
<tr>
<th>Crop</th>
<th>1552</th>
<th>1590</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>301,086</td>
<td>399,212</td>
</tr>
<tr>
<td>Barley</td>
<td>641,397</td>
<td>713,662</td>
</tr>
<tr>
<td>Date Palm</td>
<td>871,964</td>
<td>1,588,817</td>
</tr>
<tr>
<td>Rice</td>
<td>601,731</td>
<td>946,086</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

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341 BOA, TT 282, pp. 79-80, 152, 238, 278; “Hükümanme Mecmuası,” TSMK, Koğuşlar 888, ff. 56b (11 S 959/6 February 1552), 346b (15 Ş 959/6 August 1552); BOA, MD 6, no. 276, p. 131 (20 RA 972/26 October 1564); BOA, MAD 2775, p. 1272 (12 N 973/3 April 1566); BOA, MD 22, no. 9, pp. 3-4 (17 M 981/19 May 1573), no. 253, p. 124 (4 RA 981/4 July 1573), no. 278, p. 139 (10 Safar 981/10 June 1573); BOA, MD 30, no. 628, p. 271 (20 S 985/9 May 1577); TKG.KK, TT 29, ff. 9a, 74b-75a, 96b, 98b-99a, 109a, 233b, 236b-237a, 264b, 288a-b, 301b, 302b, 331b, 350a, 435b, 440a; TKG.KK, TT 30, fol. 134b.
Table 25. Production Estimates for Major Crops in Basra, 1552-1590 (Weight)

<table>
<thead>
<tr>
<th>Crop</th>
<th>1552</th>
<th>1590</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>1,455 tağar + 1,177 vezne</td>
<td>1,656 tağar + 556 vezne</td>
</tr>
<tr>
<td>Barley</td>
<td>4,065 tağar + 412 vezne</td>
<td>4,425 tağar + 1,023 vezne</td>
</tr>
<tr>
<td>Date Palm</td>
<td>10,492 tağar + 35 vezne</td>
<td>19,636 tağar + 751 vezne</td>
</tr>
<tr>
<td>Rice</td>
<td>4,388 tağar + 538 vezne</td>
<td>4,653 tağar + 510 vezne</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Finally, Istanbul’s commitment to water management in the Tigris-Euphrates alluvium had to reckon with the novel map of the early modern Middle East. Süleyman I had completed a radical geopolitical reconfiguration that brought the region’s three major imperial heartlands together under one administrative roof: western Anatolia and the southeastern Balkans, Egypt, and Iraq. With its Anatolian, Balkan, and Egyptian territories, the Ottoman administration could easily dispense with Iraq, which lacked its rivals’ access to the Mediterranean, proximity to the capital, and water resources, be it rainfall in the case of Anatolia and the Balkans or a streamflow in tune with the agricultural cycle in the case of Egypt. This state of affairs sharply contrasted with the privileged status Iraq had enjoyed under Persian tutelage in classical antiquity. The compact wealth of its alluvial land stood out in a polity poorly endowed in agricultural resources, dispersed in smaller concentrations among inland basins, mountain valleys, and the Caspian Sea littoral. No farming region could vie with Iraq for royal attention in the Persian imperial framework, which gave rise to the most extravagant irrigation infrastructure in the Tigris-Euphrates alluvium before the twentieth century. The Ottoman reconfiguration of the Middle East alienated irrigation

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agriculture in Iraq by dragging it into an unpropitious competition with far more attractive options for agricultural investment.343

Beyond economic interests, Ottoman water management in the Tigris-Euphrates alluvium was a balancing act between cultural, ideological, and political considerations. Fidelity to the precedent of ancient states and the desire to fulfill its role as a just government inspired Istanbul to be continuously engaged in matters related to agricultural development and irrigation. On the other hand, caution about change or innovation and the availability of more promising opportunities for agricultural investment around the Mediterranean curbed whatever commitments the imperial administration could make to the Tigris-Euphrates basin. The calculus would considerably change during the nineteenth century, when Western models came in vogue as sources of inspiration in competition with those from the ancient past and the loss of Egypt and most of the Balkans from the Ottoman Empire, giving greater prominence to Iraq in the eyes of Istanbul.

The Farmer’s Imperatives

The local farmer’s overriding concerns revolved around water and land, the primary factors of production. If Egypt was the gift of the Nile, Iraq was a precarious adaptation to the Tigris and Euphrates, the fortune of its farms and cities tied to a flow cycle out of phase with the agricultural calendar. It peaks mostly during the first half of the year, the first rise occurring between November and March because of rainfall and the second rise occurring between April and May because of

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snowmelt. Both peaks originate in the Taurus and Zagros mountains. The second peak occurs when the winter crops are ready for harvest and threatens the standing grain with destruction. Meanwhile, minimum flow occurs between June and October, when the summer crops are sown and the need for water is paramount.344

Organisms evolve adaptations to survive and exploit different flow regimes.345 Humans are no exception. To extract fresh water from the peculiar flow of their riverine ecosystems and unlock the agricultural wealth of their alluvial land, Iraqi farmers had to work harder than their Egyptian counterparts and engineer a more sophisticated and costly irrigation infrastructure. The overall goal of their individual efforts was creating an artificial peak coinciding with the sowing rather than harvest seasons—synchronization, in other words. The endeavor may seem an overly ambitious modification of natural flow patterns for a pre-industrial society to undertake, but it could be achieved through canal diversions and water-lifting devices, which conducted water to fields when it was most in demand.

Land morphology was a master variable governing a farmer’s choice between canal and uplift irrigation, as well as crop preferences. As their slopes flatten out south of the Samarra-Hit line, the Tigris and Euphrates lose velocity and the power to transport their sediment load, most of which they jettison over the surrounding country en route to the Persian Gulf. The entire alluvial plain is the product of this depositional process. Within it, two prominent landforms took shape, the levee and the basin, with different soil compositions, elevations, and distances from the rivers

(see Figure 23). The variations between both were subtle, imperceptible to the eye of a casual
observer, but consequential to the farmer and the natural flora.

Figure 23. Diagram of River Levees (L) and River Basins (B)


A. The Levee

The Tigris and Euphrates deposit their largest and heaviest sediment particles first adjacent to their
channels, building up narrow ridges called levees on both sides of each river (Figure 23). They
rise to a height of as much as ten feet (three meters) above the land surface, making irrigation
difficult without the use of a mechanical device to lift water from the rivers running below. A
prominent device was the waterwheel, referred to in Ottoman documents as *dolab* or *natule* (from
*noria*).346 The largest example on the Euphrates encountered by Abraham Parsons in 1774 had six
wheels, each twenty-eight feet in diameter with multiple earthen jugs two quarts in size fastened
to their rims. “The wheel being moved by the current,” the commercial consul painstakingly
described, “each jug fills with water as it dips in, and empties itself as it comes up to the top, into
the stone channel, from whence it runs to the shore, where it is received into a channel in the earth,

346 The sixteenth-century law codes of Baghdad and Basra explicitly mention land elevation
caused by the annual flood as the reason behind the use of waterwheels on the Tigris and
Euphrates, without which irrigation was impractical. See TKG.KK, TT 29, fol. 29b; BOA, TT
534, fol. 10.
and from thence is distributed into various other channels cut among the grounds, which are either naturally level, or made so by art.” An Ottoman cadaster dated to around 1580 registered eight waterwheels operating on the Tigris near Baghdad and twenty-four others on the Euphrates in the district of Zubayd Gharbi. Provincial authorities imposed a charge on their use, assessed based on the number of their pulleys (bekre) and collected either directly from those using them or through tax farmers. Other devices integrated power from animal and human muscle and were called okuz dolabı, charad, and dalya, the latter better known in the West by the Egyptian term shaduf (Figure 24). According to two British travelers on their way to Persia in 1599, farmers on the Tigris and Euphrates “have four bulls yoked together, and a device with a wheel set hard to the river side, with two great ropes; and, at the end of either rope, two long buckets made of the hide of a buffalo, and as the one cometh up the other goeth down, which bringeth up the water, that runneth in little trenches, and watereth the ground, in some places ten miles, some more, some less.”

348 TKG.KK, TT 29, ff. 29b, 450b-455a.
349 TKG.KK, TT 29, fol. 29b; BOA, İE.EV 22/2578 (11 B 1099/11 May 1688); BOA, C.ML 448/18133 (7 L 1182/14 February 1769); D.BSM.BGH 2/8 (28 RA 1148/17 August 1735).
350 TKG.KK, TT 29, fol. 314b.
351 George Manwaring, The Three Brothers; or, The Travels and Adventures of Sir Anthony, Sir Robert, and Sir Thomas Sherley, in Persia, Russia, Turkey, Spain, etc. (London: Printed for Hurst, Robinson, & Co., 1825), 46-47. See also Teixeira, The Travels of Pedro Teixeira, 56; J. S. Buckingham, Travels in Mesopotamia, including a Journey from Aleppo, across the Euphrates to Orfah, (the Ur of the Chaldees) through the Plains of the Turcomans, to Diarbekr, in Asia Minor; from thence to Mardin, on the Borders of the Great Desert, and by the Tigris (London: H. Colburn, 1827), 426-427.
Levee soils are prized for their coarse textures and elevation, which keep them well drained and safely distant from the saline groundwater. Farmers dedicated these precious areas to trees and crops least tolerant of drying conditions, notably the date palm (*Phoenix dactylifera*), whose ecological requirements are pithily summarized by the saying, “its head is in the fire, its feet in the water.” Fire came in the form of an intense and sustained summer heat under a cloud-free sky. Beyond the northern edge of the alluvium, colder winters and higher precipitation levels prevent the fertilization of the tree flowers and destroy the ripening fruits. Its crown bathed in optimal sunshine in the south, the date palm could immerse its roots in water through the porous subsoil.

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of the Tigris-Euphrates levee crests year-round without fear of salinization, earning the nickname “friend of the fountain.”

“The loftiest and most stately of all vegetable forms,” according to Alexander von Humboldt, the date palm belonged to a privileged caste in Iraq’s plant kingdom, comparable to the cedar in Lebanon and to the mango in Bangladesh. The tree became frequently mentioned in Mesopotamian literary and economic texts in the third millennium BC and was omnipresent by the time Herodotus visited Babylon in the fifth century BC. Around 1540, the Ottoman law code for Baghdad was unusually meticulous about the number of palm trees in the province—305,253, of which, 7,232 were in Baghdad City on the Tigris and 21,653 in the town of Hilla on the Euphrates. This figure must have been less than half of the entire palm population in the alluvium, for it excludes Basra and the Shatt al-Arab region, which had historically boasted a far higher concentration of palm groves naturally irrigated twice a day by the Persian Gulf tidal action. In the late sixteenth century, for instance, the Ottoman administration projected to collect

354 Simon, The Date Palm, 73; Paul B. Popeneoe, Date Growing in the Old World and the New (Altadena: West India Gardens, 1913), 36.
357 BOA, TT 1028, p. 11.
358 Katib Çelebi, Cihannûma (İstanbul: Darü’-Tibaati’l-Amire, 1145/1732), 452; V. H. W. Dowson, Dates and Date Cultivation of the Iraq, pt. 1, The Cultivation of the Date Palm on the Shat Al ‘Arab (Cambridge: W. Heffer and Sons Ltd., 1921), 20; Nawal Nasrallah, Dates: A Global History (London: Reaktion Books, 2011), 95. On tidal inundation, a traveler in 1797 observed that “the ground [in Basra] is full of cuts for the purpose of letting in the water from the river at tide-time; for without this the dates would not thrive, as they require much moisture.” John Jackson, Journey from India, Towards England, in the Year 1797 (London: Printed for T. Cadell, Jun. and W. Davies, Strand, 1799), 15-16.
four times more tax revenues on Basra’s date palms than Baghdad’s (see Table 26). As a whole, therefore, the alluvial plain was home to possibly no fewer than a million date palms in the sixteenth century, yielding nearly seven percent of Baghdad’s and Basra’s total estimated tax revenues.\textsuperscript{359} The abundance of date palms in the region dazzled foreign visitors, one of whom claimed in 1774 that the tree was more plentiful “than perhaps in any other part of the world.”\textsuperscript{360} The assertion is difficult to verify before the early twentieth century, when the Iraq Mandate did in fact have the largest palm population in the world, numbering some thirty million.\textsuperscript{361}

\begin{flushright}
\footnotesize
\textsuperscript{359} Revenues from date palms were undoubtedly much higher since the available figures were based on tax revenues imposed on the harvest only and do not take into account considerable duties the provincial administration collected on the sale and transport of dates. See BOA, TT 534, pp. 5-10; BOA, TT 282, pp. 221, 241; TKG.KK, TT 29, ff. 4a, 5b, 304b.


\textsuperscript{361} V. H. W. Dowson, \textit{The Varieties of Date Palms of the Shatt al ‘Arab}, pt. III of \textit{Dates and Date Cultivation of the Iraq} (Cambridge: W. Heffer and Sons Ltd., 1923), 17.
\end{flushright}
Table 26. Date Palm Revenue Estimates in the Alluvium, 1580-1590

<table>
<thead>
<tr>
<th>District</th>
<th>Province</th>
<th>Tax Estimate (akçe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cenub</td>
<td>Basra</td>
<td>877,038</td>
</tr>
<tr>
<td>Shemal</td>
<td>Basra</td>
<td>412,571</td>
</tr>
<tr>
<td>Hilla</td>
<td>Baghdad</td>
<td>260,032</td>
</tr>
<tr>
<td>Ashar</td>
<td>Basra</td>
<td>214,086</td>
</tr>
<tr>
<td>Mandalijin</td>
<td>Baghdad</td>
<td>168,000</td>
</tr>
<tr>
<td>Madine-i Cezayir</td>
<td>Basra</td>
<td>79,320</td>
</tr>
<tr>
<td>Cezire-i Muharrari</td>
<td>Basra</td>
<td>62,850</td>
</tr>
<tr>
<td>Rahmaniyya</td>
<td>Basra</td>
<td>52,696</td>
</tr>
<tr>
<td>Bani Mansur</td>
<td>Basra</td>
<td>37,658</td>
</tr>
<tr>
<td>Qurna</td>
<td>Basra</td>
<td>36,520</td>
</tr>
<tr>
<td>Abu Araba</td>
<td>Basra</td>
<td>33,200</td>
</tr>
<tr>
<td>Waqi</td>
<td>Basra</td>
<td>26,968</td>
</tr>
<tr>
<td>Kapan</td>
<td>Basra</td>
<td>23,600</td>
</tr>
<tr>
<td>Kil we Kinbad</td>
<td>Basra</td>
<td>21,480</td>
</tr>
<tr>
<td>Firatiyyat Baghdad</td>
<td>Baghdad</td>
<td>17,010</td>
</tr>
<tr>
<td>Tawil</td>
<td>Basra</td>
<td>16,756</td>
</tr>
<tr>
<td>Sheresh</td>
<td>Basra</td>
<td>16,080</td>
</tr>
<tr>
<td>Sadr Süveyb</td>
<td>Basra</td>
<td>6,192</td>
</tr>
<tr>
<td>Qannasiyya</td>
<td>Basra</td>
<td>1,000</td>
</tr>
<tr>
<td>Remle</td>
<td>Basra</td>
<td>320</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2,363,377</strong></td>
</tr>
</tbody>
</table>

Note and sources: see Appendix A

Both Ottoman and European authors attested to the alluvium’s status as a preeminent center for date production in the early modern world. “Unmatched date palms grow on the soil of Baghdad,” “much better than [those] of Egypt and Barbary,” wrote Katib Çelebi (d. 1657) and Guillaume Antoine Olivier (d. 1814), respectively.362 “So good, and so abundant,” Teixeira wrote about the dates of Basra, “that they are exported yearly in great quantity to Bagdad, the ports of Persia and Harmuz, and are a staple food.”363 Evliya Çelebi noted that Iraq had seventy varieties

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of dates, exported every year in hundreds of ships to India and by hundreds of thousands of camels overland to Hamadan and Isfahan in Safavid Iran. According to Captain Alexander Hamilton during his visit to Basra in 1721: “Bassora exports yearly for foreign Countries, above 10000 Tuns of Dates, which employ Abundance of Seamen for their Exportation, besides many more Poor in gathering and packing them in Mats made of the Leaves of the Date Tree, and likewise in drying them.” About fifty years later, Parsons added that dates “give bread to an innumerable quantity of people, who are employed in gathering, packing, and transporting them to every port and place in the Persian gulph and India.”

Between the sixteenth and eighteenth centuries, Evliya Çelebi provides one of the most detailed descriptions of the Iraqi date palm, informed by conversations he had with Ottoman provincial officials and local gardeners during his Baghdad visit in 1656. “By God’s verdict, the date palm is male and female,” he explained to his readers. In modern biological jargon, it is dioecious, the male and female flowers being borne on different trees, similar to the fig and wild grape vine. A single male tree yields sufficient pollen grains to impregnate a harem of forty to fifty female palms, but, if haphazardly transported by wind, only a lucky few could hit a target. For thousands of years, the species survived through anemophily (wind propagation). Among Iraqi

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366 Parsons, *Travels in Asia and Africa*, 158.
farmers desiring maximum harvest, however, the pollination process was entirely artificial, salaciously described by Çelebi. “The female palm cannot bear fruit by herself,” he wrote. “Like having coitus, she is gratified by having a sprig from the male palm inserted into her heart and [thus] bears thirty new date bunches, each weighing forty to fifty batman [295 to 385 kg].”

Virtually every part of the palm tree yields products of dietary and practical value; outlining all of them “would take a long volume,” Çelebi remarked. The main product is the date fruit, a berry rich in sugar (over eighty percent) and made up of dietary fibers and some protein. It served not only as a sweetmeat but also as a staple article of diet comparable to bread and potato, the sole food for the poor masses. Highly nutritious and affordable and easily stored and transported, the fruit made a perfect foodstuff for Ottoman armies in the east. Parsons summarized a few other uses of the date palm: “The brandy made of the dates is exceedingly good and cheap, and in many places they have mills to grind the date stones, of which they make oil, and with the paste which is left they feed the cattle and sheep… With the leaves of this tree they cover the houses of the poor people in small towns and villages, which are built of the wood, while the branches are split to make baskets and frailts.”

The most engrossing aspect of the Iraqi palm for Çelebi was not its reproductive organs or mating system but rather its graceful height. “I have not seen a palm this tall and excellent, neither

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370 Evliya Çelebi, Evliya Çelebi Seyahatnamesi, 4:261.
372 Sestini, Voyage de Constantinople à Bassora, 204-205; Olivier, Voyage dans l’Empire Othoman, 4:419.
373 BOA, MD 7, no. 1312, p. 454 (2 ZA 975/30 April 1568).
374 Parsons, Travels in Asia and Africa, 159. See also Olivier, Voyage dans l’Empire Othoman, 4:419; Sestini, Voyage de Constantinople à Bassora, 202.
in Egypt, the Sudan, nor in Tlemcen,” he wrote.375 It grew to a height of sixty to eighty feet, with feather-like leaves at the top ranging between ten and twenty feet in length.376 The local population had long realized that, when strategically planted, the giant date palm could lower the surface and air temperatures by providing a natural shade canopy and through evapotranspiration. In this respect, the Iraqi date grove was not simply a natural phenomenon but also an artificially-designed cooling amenity and heat sink for towns and fields (see Figure 25). It allowed farmers to establish multi-story gardens on levee crests, comprised of the date palms themselves at the top, smaller fruit trees such as pomegranate and citrus in the middle, and plots of cereals, vegetables, and legumes at the bottom.377 In 1797, a British traveler in Basra took note of the interplanting of crops, writing, “The date-trees being planted about ten feet from each other, and full of leaves at top, afford a very good shade; and the people are enabled to cultivate the ground during the whole day, without suffering much in convenience from the heat of the sun, which out of the shade, and in the middle of the day, is at this season not to be endured.”378

375 Evliya Çelebi, Evliya Çelebi Seyahatnamesi, 4:260.
376 Charles, “Onions, Cucumbers and the Date Palm,” 2; Simon, The Date Palm, 53.
378 Jackson, Journey from India, 22-23.
To summarize, farmers relied heavily on water lifting devices to bring under cultivation the Tigris-Euphrates levees, zones they largely devoted to date palm horticulture. Levees offered excellent soil and proximity to the rivers, and palms gave in return incalculable economic, nutritional, and practical benefits that few other plants could offer. The tree reshaped life around it by providing an auspicious micro-climate, cooler and more humid than the rest of the country, for the cultivation of other fruits and vegetables. Neither orange nor apricot could have proliferated in the alluvium without the aid of palms. The investment ultimately led to the development of one of the largest date groves in the world, to the modern era an aesthetic heritage and the scene of folktales and songs.

**B. The Basin**

After depositing the heaviest sediments nearby to form levees parallel to their channels, the Tigris and Euphrates scattered the fine clay particles further away, forming natural depressions called basins throughout the alluvium (Figure 23). Distance from the rivers and high levee barriers
complicated efforts to irrigate basin landforms and make them productive. Until the nineteenth century, Egyptian farmers faced a similar dilemma but could count on the annual Nile flood, which naturally irrigated their basins on schedule and prepared them for the sowing of winter crops. With the late flood peak of the Tigris and Euphrates, the Egyptian system of basin irrigation was out of the question in Iraq. Instead, for 6,000 years, Mesopotamian farmers relied on perennial irrigation to expand the frontiers of cultivation into alluvial basins. The system was highly elaborate, dependent on a network of branching canals that deflected the main flow to agricultural units behind the levees. Canal construction entailed the installment of additional water-control devices, a combination of weirs, dams, and sluices that assisted in raising and diverting the rivers into the distributary canal intakes during the low flow period.  

The flat alluvial plain tied a Gordian knot around canal excavation. Much of it slopes at gradients between 1:5,000 and 1:10,000, severely constraining the efforts of basin farmers to establish an irrigation canal at a higher gradient (ideally about 1:1,000) to avoid excessive sedimentation. Local engineers had two traditional solutions to this engineering conundrum. The first was to excavate a diversion canal running parallel to the rivers and following the plain’s declining longitudinal grade (Figure 26). To achieve a slope sufficiently steep and conductive to

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flow on this gentle gradient, the canal had to be long, its tail end far distant from the head gate upstream. Due to its length, the parallel canal could bring together separate agricultural communities to cultivate a larger surface area than what an individual community could handle alone. On the other hand, the canal’s scale and complexity made it in most cases reliant on the resources and administrative apparatus of a state with deep pockets for its construction and subsequent maintenance. The most extreme illustration of a parallel canal in the region comes from the Nahrawan complex east of the Tigris between Samarra and Kut (Figure 27). The length of its two main canals, the Katul al-Kisrawi (upper course) and the Nahrawan proper (lower course), totaled more than 185 miles and irrigated around 1,500 square miles, an area roughly the size of Rhode Island. The canal complex was a state-directed undertaking, reaching its fullest growth during the reign of Khosrow I (r. 531-579), and tied to the support and stability of the Sasanian bureaucratic machinery.\footnote{Adams, \textit{Land Behind Baghdad}, 76-80, 99-105; Guy Le Strange, \textit{The Lands of the Eastern Caliphate: Mesopotamia, Persia, and Central Asia from the Moslem Conquest to the Time of Timur} (Cambridge: Cambridge University Press, 1905), 29, 49-50, 57-62; Jaafar Jotheri, “Holocene Avulsion History of the Euphrates and Tigris Rivers in the Mesopotamian Floodplain” (Ph.D. diss., Durham University, 2016), 127-128.}
Figure 26. Layout of a Large Longitudinal Canal and Short Lateral Canals


Figure 27. The Tigris-Euphrates Nahrawan and Transverse Feeder Canal Systems

The ancient system of feeder canals survived under Ottoman rule, but on a much more restricted geography (see Figure 28). Its most precious fragment was the Dujayl (the Little Tigris), a canal about sixty miles long and 165 feet wide derived from the Tigris below Samarra and terminating in Baghdad’s northwestern suburbs. In the late sixteenth century, the Dujayl was the primary source of water for an entire district by the same name, home to 1,500 taxpayers, fifty villages, and fifty marginal lands (mezra’ā). The district was the most profitable farming region on the Tigris after Diyala northeast of Baghdad (Table 27). A smaller yet more symbolic parallel canal was located on the Euphrates and called the Shahi, named after Shah Ismail I who built it soon after his conquest of Iraq in 1508 to supply drinking water to the holy city of Najaf. An elevated platform (thus the Arabic term najaf, in reference to a hill) made the city an ideal burial site for a number of prophets and saints in the Shi‘i tradition, well-protected from the Euphrates flowing below it, but complicated the work of canal excavators, who had to circumvent Najaf’s high ground in a composite canal. Its first section ran in an open channel taken south of Musayyib and terminating in Kufa northeast of Najaf. From Kufa to Najaf, the Shahi Canal

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384 The Imam Ali Shrine in Najaf’s old city center and its portion of the Euphrates are about 220 and 90 feet above sea level, respectively. For an accessible introduction to Najaf, see Yasser Tabbaa and Sabrina Mervin, Najaf, the Gate of Wisdom: History, Heritage and Significance of the Holy City of the Shi‘a (Paris: UNESCO, 2014).
displayed the trappings of Persian hydraulic engineering. In a scheme believed to be first introduced by the Shi‘i Buyid Dynasty (945-1055) from south of the Caspian Sea, it flowed in a subterranean channel called kariz in Ottoman documents, the Persian word for qanat.\textsuperscript{385} In total, the canal was likely some twenty-five miles long and, in the late sixteenth century, irrigated an entire district named “the Najaf River,” populated by 1,300 taxpayers and contributing nearly one million akçe to the provincial treasury.\textsuperscript{386} Because of their exceptional scale, complexity, profitability, and symbolism, both the Dujayl and Shahi canals fell under the direct oversight of the Ottoman Empire and were classified as part of the havas-ı hümayun, their revenues being reserved for the sultan and sent to the central state treasury in Istanbul every year.\textsuperscript{387}


\textsuperscript{386} TKG.KK, TT 29, ff. 266b-303b.

\textsuperscript{387} For the Dujayl Canal, see BOA, Í.E.ML 5/353 (Evasit C 1075/29 December 1664-7 January 1665); BOA, MD 12, no. 893, pp. 465-466 (2 RA 979/24 July 1571). In the post-Tanzimat period, it was classified as part of the emlak-ı seniyye. See BOA, BEO 622/46597 (19 ZA 1312/14 May 1895). The Ottoman administration initially endowed the Shahi Canal to the two holy shrines in Najaf and Karbala but by 1575 changed its status into havas-ı hümayun based on the recommendation of Baghdad’s governor Elvend Beg-oğlu Ali Pasha. See TKG.KK, TT 29, fol. 268b.
Figure 28. Major Ottoman Canals in the Tigris-Euphrates Alluvium

Credit: Faisal Husain, 2018.

Table 27. Tax Projections for the Dujayl District

<table>
<thead>
<tr>
<th>Year</th>
<th>1540</th>
<th>1544</th>
<th>1580</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount (akçe)</td>
<td>219,861.5</td>
<td>1,428,540</td>
<td>1,446,943</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

The parallel diversion, exemplified by the Dujayl and Shahi canals, was an extravagant and rare solution to the alluvium’s flat surface. Another formula, cheaper and more popular, took advantage of the raised levees adjacent to both trunk and branching channels. Between levee crests and basin depressions, water could flow downslope and transform its potential energy into kinetic form more efficiently and within a shorter distance than possible along the plain’s longitudinal gradient. Farmers simply needed to create a break (*kharq* in Ottoman jargon) in the levee wall to
divert the flow and a short canal (šube) to carefully manage the distribution of water between fields and gardens.388

The lateral spur canal was the dominant feature of the alluvial plain’s irrigation landscape between the sixteenth and eighteenth centuries, numbering in the dozens and perhaps hundreds. Compared to the Dujayl and the Shahi, it serviced smaller areas and thus generated modest harvests, but its excavation and subsequent maintenance fell within the capacities and resources of kin groups and local communities. The scheme spared bureaucrats the hassle and costs of maintaining a permanent presence in rural areas. Mediating their relationship with each agricultural unit were tax farmers, both males and females, who held contracts (mukataʿa) that entitled them to collect a negotiated share of the canal’s annual revenues on behalf of the provincial government.389 In these respects, Iraq’s short lateral canals resembled the baladi canals of Egypt, defined by Alan Mikhail as those which “served the irrigation needs of one particular community and no one else” and were “maintained by local leaders.”390

The length of the lateral canal averaged less than three miles. In exceptional circumstances during the Ottoman period, however, it was multiple times longer.391 The Isa River was a case in point, a remnant of the transverse feeder canal system that channeled the Euphrates waters to the heart of the alluvial plain (Figure 28). Named after an Abbasid prince, it originated north of Falluja and, with the aid of a topographic decline from west to east, reached Baghdad’s western suburbs

389 For cases of females acting as canal tax farmers, see BOA, C.ML 584/24030 (24 C 1190/11 July 1776); BOA, C.ML 251/10364 (7 ZA 1215/22 March 1801); BOA, C.ML 236/9894 (4 C 1222/8 August 1807); BOA, C.ML 507/20612 (21 RA 1225/25 April 1810).
390 Mikhail, Nature and Empire in Ottoman Egypt, 42.
every year for several months during peak flood.392 The river’s tactical location and length (roughly twenty miles) served vessels approaching from the Euphrates in Anatolia and Syria as a seasonal highway to Baghdad and the lower Tigris.393 In the first decades of Ottoman rule, provincial authorities made an effort to keep the Isa River flowing, facilitating in the spring of 1560 the passage of sixty vessels carrying Anatolian timber from the upper Euphrates to Baghdad on the Tigris.394 Soon, however, they realized that dealing with the chronic instabilities of the large canal was overly cumbersome, auctioning it off to the highest bidder about a decade later.395 Another exceptionally long lateral canal (about 10 miles) was the Süleymani River, west of the Euphrates dug soon after Süleyman I’s conquest of Baghdad to supply the holy city of Karbala with fresh water. Despite offers to acquire it as a tax farm, the canal remained an endowment to

393 During the flood season in May 1812, the British East India Company resident Claudius James Rich witnessed rafts laden with lime moving from the Euphrates near Falluja to the northern gate of Baghdad called Imam Musa. Sir Robert Ker Porter, Travels in Georgia, Persia, Armenia, Ancient Babylonia, & c. & c. during the Years 1817, 1818, 1819, and 1820 (London: Longman, Hurst, Rees, Orme, and Brown, 1822), 2:405.
395 BOA, MD 12, no. 588, p. 287 (17 ZA 978/12 April 1571); BOA, MD 22, no. 9, pp. 3-4 (17 M 981/19 May 1573).
the shrine of Husain (d. 680) under Ottoman custody, while subsidiary branches dug from it were readily farmed out.396

Basins, whether irrigated by large or small canals, were the primary zones of cereal crop cultivation, dominated by wheat and barley.397 Tables 28 and 29 list revenue estimates for both crops in Baghdad and Basra during the late sixteenth century, generating nearly eighteen percent of the alluvium’s revenue potential. To contextualize the crops’ geographic distribution, the alluvial plain can be divided into two parts: the river plain in the north (the Baghdad province) and the delta plain in the south (the Basra province), with the Gharraf River (a lower Tigris branch draining towards the Euphrates) marking the boundary between them (Figure 27). The difference between the two alluvial subunits is crystalized in the form of extensive marshes that dominate the delta plain, where sea level falls below fifteen feet (five meters).398 The northern river plain was far more productive in both cereal crops than the delta plain in the south, where the popularity of date palm (Table 26) and rice (Chapter 5) stifled the expansion of competing grains. Even though a few districts generated more revenue for wheat (e.g. Mandalijin in Baghdad and Sheresh in

396 BOA, MD 24, no. 652, p. 245 (28 M 982/20 May 1574); BOA, MD 25, no. 592, p. 57 (21 L 981/13 February 1574); Nazmizade, “Gülşen-i Hulefa,” 80b. For an offer to acquire the Süleymani Canal by one of the inhabitants of Baghdad, rebuffed by Selim II, see BOA, MD 26, no. 131, p. 51 (9 RA 982/1574). For cases of branches of the Süleymani Canal farmed out to private individuals, see BOA, C.ML 395/16167 (16 CA 1179/31 October 1765); BOA, C.ML 584/24030 (24 C 1190/11 July 1776); BOA, C.ML 241/10070 (20 Ş 1192/12 September 1778). For a history of the Süleymani Canal, see Abdulhusain Al Tuʿma, Bughyat an-Nubalaʾ fi Tarikh Karbalaʾ (Baghdad: Matba’at al-Irshad, 1966), 97-100.
397 Farmers pushed the cultivation of cereal crops down to the basins in part because they were less demanding of water than date palms and other vegetables. Postgate, Early Mesopotamia, 177.
398 The division of the alluvial plain into two parts is adopted by Susan Pollock, Ancient Mesopotamia: The Eden That Never Was (Cambridge: Cambridge University Press, 1999), 32. Buringh provides a more detailed analytical scheme of the region, dividing it into eight physiographic units based on soil conditions. See Piet Buringh, Soil and Soil Conditions in Iraq (Baghdad: Ministry of Agriculture, 1960), 115-191.
Basra), overall barley reigned supreme in the entire alluvial plain. Its high salt tolerance and suitability as a fodder crop particularly appealed to farmers in the marshy delta plain, where salinization was more chronic than in the north.

Table 28. Tax Projections for Cereal Crops in Baghdad, c. 1580 (Akçe)

<table>
<thead>
<tr>
<th>District</th>
<th>Wheat</th>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dujayl</td>
<td>559,743</td>
<td>569,870</td>
</tr>
<tr>
<td>Khalis</td>
<td>388,107</td>
<td>601,765</td>
</tr>
<tr>
<td>Shahraban</td>
<td>349,780</td>
<td>353,798</td>
</tr>
<tr>
<td>Mahrud</td>
<td>234,791</td>
<td>266,822</td>
</tr>
<tr>
<td>Tariq-i Khurasan</td>
<td>149,943</td>
<td>233,049</td>
</tr>
<tr>
<td>Baghdad City</td>
<td>131,544</td>
<td>227,025</td>
</tr>
<tr>
<td>Furatiyyat Baghdad</td>
<td>107,694</td>
<td>73,105</td>
</tr>
<tr>
<td>Mandalijin</td>
<td>108,000</td>
<td>71,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,029,602</td>
<td>2,396,434</td>
</tr>
</tbody>
</table>

Source: see Appendix A

Table 29. Tax Projections for Cereal Crops in Basra, c. 1590 (Akçe)

<table>
<thead>
<tr>
<th>District</th>
<th>Wheat</th>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimal</td>
<td>82,610</td>
<td>140,492</td>
</tr>
<tr>
<td>Janub</td>
<td>18,428</td>
<td>127,628</td>
</tr>
<tr>
<td>Turre-i Cezayir</td>
<td>58,008</td>
<td>126,728</td>
</tr>
<tr>
<td>Zakiyya</td>
<td>121,780</td>
<td>125,756</td>
</tr>
<tr>
<td>Cezire-i Muharrari</td>
<td>2,322</td>
<td>95,760</td>
</tr>
<tr>
<td>Kapan</td>
<td>65,760</td>
<td>60,920</td>
</tr>
<tr>
<td>Ashar</td>
<td>20,172</td>
<td>54,126</td>
</tr>
<tr>
<td>Abu Araba</td>
<td>34,416</td>
<td>50,088</td>
</tr>
<tr>
<td>Qurna</td>
<td>23,688</td>
<td>45,840</td>
</tr>
<tr>
<td>Sheresh</td>
<td>50,640</td>
<td>40,260</td>
</tr>
<tr>
<td>Sadr Süveyb</td>
<td>37,500</td>
<td>36,560</td>
</tr>
<tr>
<td>Gharraf</td>
<td>-</td>
<td>32,160</td>
</tr>
<tr>
<td>Iskele-i Aqqara</td>
<td>26,880</td>
<td>25,600</td>
</tr>
<tr>
<td>Remle</td>
<td>21,120</td>
<td>20,800</td>
</tr>
<tr>
<td>Qannasiyya</td>
<td>-</td>
<td>16,000</td>
</tr>
<tr>
<td>Rahmaniyya</td>
<td>17,040</td>
<td>13,600</td>
</tr>
<tr>
<td>Hammar</td>
<td>15,600</td>
<td>8,640</td>
</tr>
<tr>
<td>Madine-i Cezayir</td>
<td>2,796</td>
<td>2,648</td>
</tr>
<tr>
<td>Bani Mansur</td>
<td>2,247</td>
<td>730</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>601,007</td>
<td>1,024,336</td>
</tr>
</tbody>
</table>

Source: see Appendix A
To recapitulate, early modern Iraqi farmers configured their agrarian landscape around two fundamental natural forces that had shaped agriculture in the region for millennia—flooding and sedimentation. Their strategies, as a logical result, drew on the proven methods and experiences of former generations that had to deal with the same fluvial processes. Sediment deposition by the Tigris and Euphrates divided the alluvial plain into two major agricultural landforms, the levee and the basin. The local inhabitants relied on uplift irrigation to turn the former into flourishing orchards and kitchen gardens but faced numerous obstacles in the attempt to cultivate the latter. Before the diesel pump, irrigating basins in low-lying river valleys was a universal engineering problem. The lack of natural means to supply them with water, whether in the form of sufficient rainfall or an annual flood coinciding with the sowing season, had given an otherwise ubiquitous complication a distinctive notoriety in the Tigris-Euphrates alluvium. To expand the perimeters of cultivation beyond river levees, farmers had to devise a perennial irrigation system based on large and small gravity-flow canals and control installations designed to keep the canals serviceable.

In the light of works that emphasize agrarian decay in the post-Mongol period, what is striking about early modern irrigation agriculture in the alluvium, as meticulously portrayed in Ottoman documentation, is not the transformation it experienced, be it negative or even positive. Rather, more remarkable is the persistence of elaborate irrigation works based on ancient custom and knowledge, on which the prosperity of the Ottoman administration and provincial society depended. By pre-industrial standards, the Tigris-Euphrates alluvium under Ottoman rule boasted a highly artificial and complex perennial system of production. Like all complex social and economic systems, however, it was riddled with vulnerabilities.
Silt

The inherent vulnerability of perennial irrigation, compared to the basin variety on the Nile, stems from its highly interventionist approach to the natural flow regime. The water diverted by the system’s canals, regardless of their size, is never proportional to the diversion of the sediment load carried in from the rocky uplands. Constant human intervention is critical to artificially maintain the necessary balance between the twin supplies of water and sediment in any given canal. When the diverted ratio of water-to-sediment was high, the river persistently widened the canal mouth and made the diversion unmanageable, causing enhanced erosion and in some cases a channel shift, a phenomenon that will be discussed at length in Part III. On the other hand, when the diverted water-to-sediment ratio was low, the main channel threw up a bank that blocked the receiving waterway and triggered enhanced sedimentation, the focus of this section.399

Sediment deposition within the channel is a natural process on the reduced gradient of river valleys. What made it more severe and persistent in the Tigris-Euphrates alluvium was the numerous canal diversions and water-control devices associated with perennial irrigation, all of which imposed additional impediments to flow and turned Baghdad and Basra into giant sediment traps. Making matters worse was the unusual high silt content of the Tigris and Euphrates, four to five times more than that of the Nile.400 The perpetual problem captured the attention of keen outside observers such as Strabo (c. 63 BC-AD 23), who wrote about the Tigris-Euphrates canals: “there is need of much labor to keep them up, for the soil is so deep and soft and yielding that it is

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easily swept out by the streams, and the plains are laid bare, and the canals are easily filled, and their mouths choked, by the silt.”¹⁴⁰¹ Farmers or otherwise, the local population had to deal with the rivers’ high silt content for daily consumption. “The Euphrates is continually muddy,” wrote one traveler in 1574, “and therefore almost not fit to be drunk, except you let it stand Two or Three Hours, until the Sand and Mud is sunk down to the bottom, which sometimes is of the thickness of an Inch: So that in every House where they have no Wells, all along the River in Towns and Villages, they have several great Pots which they fill out of the River, and let them stand until it be setled [sic], but if they have occasion to drink of it before, they drink through their Towels.”¹⁴⁰²

Not surprisingly, one of the main tasks of the Ottoman provincial administration was to ensure that the waterways of Iraq were regularly cleared from the accumulated silt and kept flowing. The Imperial Council in Istanbul made the expectation explicit in an order it dispatched to Baghdad’s governor in October 1579, concluded with the conventional reminders to guard and protect the province and ensure the safety and prosperity of subjects, as well as to “excavate and clear the rivers that require excavation and widening.”¹⁴⁰³ The way provincial officials sought to fulfill their duty depended on the canal type. The vast majority of canals were short and farmed out to local leaders, whose title deeds entailed their responsibility to oversee their canals’ regular clearance and repair. Otherwise, members of their communities would not have been able to

¹⁴⁰² Dr. Leonhart Rauwolff, “Travels into the Eastern Countries,” in A Collection of Curious Travels and Voyages, ed. John Ray (London: Royal Society, 1693), 1:127. In 1673, another traveler wrote that the population puts river water “through large filters of earth. As it passes from one to the next, it becomes clear and purifies itself so as to be left clean and healthful.” Bembo, The Travels and Journal of Ambrosio Bembo, 125. See also Jackson, Journey from India, 57.
¹⁴⁰³ “Hafır ve tevsi’i lazım olan enharın dahi hafır ve tathirsin.” BOA, MD 40, no. 436, p. 194 (17 Ş 987/8 October 1579).
produce the harvest necessary to fulfill their contract obligations and would thus risk being stripped of their tax collection privileges. In a few cases, nonetheless, a tax farm contract would explicitly stipulate not only the annual payments to the government, whether in cash, in kind, or both, but also the number of canal excavators (haffar) and sometimes even “meadow watchmen” (çayır bekçisi) who had to be employed to oversee the canal. 404

Large parallel canals, in particular, tended to fill more rapidly with silt due to their low gradient and large size and the inability of a single community to keep the problem in check. Coordination by a state bureaucracy to assemble the necessary manpower for the task was critical. The Baghdad administration employed a corps of excavators and deployed them every year to clear canals owned by the sultan. 405 Arrangements specifically made for the highly-lucrative Dujayl Canal further highlight Ottoman-sponsored sediment-clearing efforts. Since the conquest of Baghdad in 1534, a common complaint was the tendency of the canal mouth to clog and become stony. 406 Süleyman I, in response, placed a quota on seventeen villages around Iraq, each based on its capacity, to send workers for a period of forty days every year to dredge the Dujayl Canal. In total, he recruited 900 villagers just for this purpose and for this canal. The recruitment arrangement discontinued at some point but was later revived in 1660 by the governor of Baghdad.

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404 The common number of canal excavators that tax farmers had to employ was two. See BOA, MAD 9968, p. 235 (24 C 1163/30 May 1750); BOA, C.ML 38/1732 (26 M 1178/26 July 1764); BOA, C.ML 257/10600 (22 M 1190/13 March 1776); BOA, C.ML 251/10364 (7 ZA 1215/22 March 1801); BOA, C.ML 236/9894 (4 C 1222/8 August 1807). Some tax farmers had to employ as many as six excavators. See D.BŞM.BGH 4/1 (2 Z 1189/23 January 1776).

405 BOA, MD 33, no. 364, p. 183 (9 ZA 985/18 January 1578); BOA, AE.SMMD.IV 9/900 (24 R 1075/13 November 1664). For tertiary lateral canals dug from larger canals such as the Dujayl, tax farmers were in charge of sediment clearance. See, for example, BOA, MAD 2926, p. 180 (15 Z 1093/15 December 1682).

406 “Düçeyl Nehri’ nin harkı boğazı taşı olup.” BOA, MD 26, no. 434, p. 164 (9 R 982/29 July 1574).
Murtaza Pasha. Workers deployed to the Dujayl Canal occasionally complained about abuse at the hands of Ottoman officials, leading many of them to ignore orders and never report to work. The imperial administration sought to deal with these conflicts either by financial punishments of the workers or by admonishing provincial officials to treat subjects according to the Islamic sharia and Ottoman law. When specialized expertise was necessary, the Imperial Council in Istanbul intervened to provide it. In 1574 and 1579, for instance, it ordered Diyarbakır’s governor to dispatch a sufficient number of master workers in stone (ustad taşçı) to “cut the channel and have its mouth excavated.” In early 1688, after a period of neglect and a great flood in the Tigris that blocked the Dujayl, officials gave up on the idea of reopening the old mouth and created an entirely new one in a nearby location.

The Ottoman mobilization of resources and labor was equally essential to maintain the long Shahi Canal irrigating Najaf. Officials in Baghdad established and endowed several shops (dükkanlar) along the canal’s subterranean section between Kufa and the holy shrine to keep it clear and functioning and appointed two individuals, Mevlana İbrahim and Selman, as


408 BOA, MD 6, no. 220, p. 105 (5 RA 972/11 October 1564); BOA, MD 12, no. 893, pp. 465-466 (2 RA 979/24 July 1571).

409 “Boğaz kesilip harkin kazdırmak.” BOA, MD 26, no. 434, p. 164 (9 R 982/29 July 1574); BOA, MD 40, no. 665, p. 290 (15 Ş 987/7 October 1579).

410 BOA, MAD 2935, p. 174 (13 CA 1099/16 March 1688).
superintendents (nazir ve mübaşir) to regulate destructively random attempts by land owners to divert the canal to their private properties.\(^{411}\) In addition to the main canal, officials had to dig and maintain a branch designated for water carriers, who made four trips a day to Najaf to supply its inhabitants with drinking water. The water carriers’ branch required its own annual clearing campaigns that cost 20,000 akçe, an amount that officials struggled to pay.\(^{412}\) Frequent reports and petitions by the local authorities and inhabitants reveal the large canal’s fragility and its constant need for clearance and repair.\(^{413}\)

Removing silt from the Shahi Canal ensured the prosperity of Najaf, burnished the image of the Ottoman sultan, and, surprisingly, kept the Safavid menace at bay. The failure of Najaf’s water-supply system always created an opportunity for Safavid royals to offer their help and intervene in the affairs of the holy Shi‘i city, to the chagrin of the Ottoman Sunni elite. Tahmasp I’s patronage of Najaf seems to have been particularly considerable. When Teixeira visited the city in 1604, he remarked that the Ottoman “aqueduct” was foul and choked up, brackish wells being the population’s only source of drinking water. “Some inhabitants told me,” he wrote, “that [Najaf] had declined in every way after the death of Xa Thamás [Shah Tahmasp], king of Persia, who favoured the place greatly.”\(^{414}\)

A Safavid request to revive the choked Shahi Canal made by Shah Sultan Husayn (r. 1694-1722) to Ahmed III (r. 1703-1730) reveals how the Ottoman state felt about its Shi‘i rival’s

\(^{411}\) BOA, MD 7, no. 2316, p. 846 (1 CA 976/22 October 1568), no. 2331, p. 851 (1 CA 976/22 October 1568).
\(^{412}\) BOA, MD 26, no. 389, p. 148 (24 R 982/13 August 1574); BOA, MD 27, no. [illegible], p. 305 (28 ZA 983/28 February 1576).
\(^{413}\) BOA, MD 12, no. 656, p. 319 (3 Safar 979/26 June 1571); BOA, MD 14-1, no. 73, p. 57 (3 M 979/27 May 1571); BOA, MD 23, no. 767, p. 342 (5 ZA 981/26 February 1574); BOA, MD 33, no. 434, p. 213 (12 ZA 986/10 January 1579); Yitzhak Nakash, The Shi‘is of Iraq (Princeton: Princeton University Press, 1995), 18-21.
\(^{414}\) Teixeira, The Travels of Pedro Teixeira, 48.
attempts to intervene in the hydraulic affairs of Najaf. After receiving the formal request from a Safavid embassy to Istanbul in October 1705, the central administration forwarded it to Baghdad’s governor in December, asking him to form a commission to inquire into the implications that the proposed Safavid project could have.\footnote{BOA, AE.SAMD.III 208/20076 (Evacit N 1117/28 December 1705-7 January 1706). The most comprehensive account of the Safavid embassy delivering the request and Ottoman deliberations is provided by Selim Güngörürler, “Diplomacy and Political Relations between the Ottoman Empire and Safavid Iran, 1639-1722” (Ph.D. diss., Georgetown University, 2016), 390-406.} The commission, comprised of Baghdad’s prominent Sunni clerics and military officers, concluded within two months that the Shi‘i Safavids were using the canal as a pretext (bahane) to meddle in the affairs of the Ottoman (and Islam’s) frontiers. Granting the Safavids permission, the commission added, would bring to the Ottoman state “utter disgrace and damage” (mahz qubh ve zarar) and entail “dangers and evils” (mahzarat ve mefasid).\footnote{BOA, A.DVN 305/23 (27 L 1117/11 February 1706).} The central administration readily accepted the commission’s recommendation and informed Isfahan that supplying Najaf with water was the exclusive honor of the Ottoman sultan.\footnote{Güngörürler, “Diplomacy and Political Relations,” 403.} Later in the century, as Chapter 7 will show, Russian expansion would force Istanbul to forfeit this prerogative. A canal project for Najaf sponsored by a Shi‘i Indian royal would fulfill the prophecy of the Baghdad commission in 1705-1706, bringing “utter disgrace and damage” to the Ottoman state in the east.

In short, perennial canals made the irrigation of basin depressions possible when the Tigris-Euphrates discharge was minimal but had unintended environmental and political consequences. By slowing or impeding the flow, they intensified the accumulation of silt and clay and required constant human intervention to keep the canals functioning. Maintaining long diversion canals, in particular, imposed a prohibitive social and financial toll and largely depended for their survival
on the additional resources and coordination of the Ottoman bureaucracy. When not attended to regularly, canals clogged and threatened to cause bigger natural disasters, including the breaking of river banks. The practical problem of silt control was identical for the Ottomans as for all others who had earlier controlled the Tigris and Euphrates, but the political stakes, at least in the case of Najaf’s Shahi Canal, were higher because of the Safavid Empire. Neglecting sediment clearance created additional regional tensions by giving grounds for the Shiʿi power to intervene in the local affairs of an Ottoman town symbolically important to both rivals.

Salt

“All our prospect consisted of a burning desert covered with a crust of salt, making a noise under the feet similar to that caused by walking on frozen snow,” wrote John Jackson, a British traveler passing by Basra in the summer of 1797. The accumulation of salts in the soil, or salinization, occurred to varying degrees throughout the entire alluvium and highlighted one of perennial irrigation’s biggest design failures. Human disturbance of the natural hydrological cycle with canal diversions inadvertently caused a breakdown in the mineral’s movement, transferred together with silt by streamflow from the sedimentary rocks in the north. Unlike the basin system in the Nile Valley, which inundated Egypt every year for limited span of several weeks to a few months depending on the flood level, perennial irrigation opened the Tigris-Euphrates alluvium to a steady, year-round supply of river waters that burdened its soil and fertility. Low-lying basin landforms were particularly vulnerable due to their proximity to the groundwater table and the low permeability of their fine textured soils, which make them ill-equipped to drain surplus irrigation

418 Jackson, Journey from India, 16. Similarly, Olivier wrote: “On ne voit partout, dans ce vaste desert, que des terres grisâtres et blanchâtres, imprégnées de selenite et même de sel marin.” Olivier, Voyage dans l’Empire Othoman, 4:382.
water. As the stagnant water evaporates and transpires, its salt concentrations remain on the surface, forming in some cases a thick salt crust similar to that trod upon and vividly described by Jackson near Basra.419

Salinized soil in the alluvium, according to the Italian numismatist Domenico Sestini in 1781, made cultivation “painful and expensive.”420 It obstructed the absorption of water and key nutrients by crop plants and caused far-reaching damage to agricultural yields. Officials and farmers developed a wide range of mechanisms to cope with the environmental hazard. A common one was the general preference throughout the Baghdad and Basra provinces for cultivating salt-tolerant grain crops such as barley (see Tables 28 and 29). Another ancient technique, attested to in Sumerian agriculture, reclaimed contaminated soil by leaching salts out with sufficient water.421 Sestini offers a rare glimpse of a more onerous measure undertaken when leaching was impractical, which involved digging up and removing the salinized topsoil to work the deeper soil layers. “Toute la superficie étant imprégnée de parties salines,” he wrote, “il faut l’enlever et creuser jusqu’à la terre productive. On ne peut que par ce moyen, avoir du bled, de l’orge et du riz; les moissons en sont ensuite abondantes.”422 Around 1552, the Basra cadaster documents ten cases of

420 Sestini, Voyage de Constantinople à Bassora, 203.
422 Sestini, Voyage de Constantinople à Bassora, 203.
salt flats (*sabkha*), described as “derelict, idle, and useless” (*kharab atil ve batil*), successfully reclaimed by different individuals, likely by either leaching or excavation.\(^{423}\)

Farmers could, in addition, mitigate the deleterious accumulation of salts using traditional crop husbandry, such as farming in crop-fallow rotation. By leaving the salinized soil of a grain field fallow (idle) to rest every second year, they allowed salt-tolerant weeds and other deep-rooted annuals to grow naturally, dry out the subsoil to a depth of five to ten feet (two to three meters), and lower the water table. Among those soil-healing plants was *Salsola*, a saltwort that, according to Sestini, was collected by locals and used to make soda, soap, and glass.\(^{424}\) In the following cultivation cycle, the dry subsoil would allow irrigation water to wash salts out from the surface and rehabilitate the soil.\(^{425}\) The fallow system was in operation in the region by the third millennium BC and has been documented in modern agricultural studies. Evidence of its application during the early modern era can be inferred from widespread arrangements that divided agricultural and pastoral labor within the same tribe and local community, detailed at a greater length in Chapter 4. Fallow fields were central to such arrangements, providing flocks with weeds and stubble during the summer and receiving in return droppings that enabled the salinized soil to recover nutrients. In the late sixteenth century, the Khafaja, Bani Kilab, Bani Zayd, Al Yasar, and ʿUbada, to name only a few, were among the tribes that had both agricultural and pastoral components and likely relied on the traditional fallow scheme to maximize their production.\(^{426}\)

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\(^{423}\) BOA, TT 282, pp. 79-80.  
\(^{424}\) Sestini, *Voyage de Constantinople à Bassora*, 203.  
\(^{426}\) TKG.KK, TT 29, ff. 143b-145a, 173a, 178a-b, 194a-b, 197b, 230a, 237b-239a, 403a-b.
Lastly, like carbon in the atmosphere, salt in and of itself was not an enemy to the population. Rather, what made the mineral toxic was its presence in the wrong place within the root zone of plants at the wrong dose.\textsuperscript{427} Instead of simply disposing of the salt in the soil, the Ottoman provincial administration made efforts to use it profitably. A prominent initiative was the Basra saltworks (\textit{memlaha-i Basra}, or \textit{memlaha-hane}), one of the city’s major sources of revenues where the mineral was refined and prepared for commercial purposes (Table 30 and Figure 29).\textsuperscript{428} Another saltworks appears south of Hit along the Euphrates on an Ottoman map drawn in the middle of the seventeenth century (Figure 30). In addition to establishing saltworks, the administration imposed a specific toll on private vessels engaged in the salt trade on the Tigris, Euphrates, and Shatt al-Arab.\textsuperscript{429}

Table 30. Revenue Projections for the Basra Saltworks

<table>
<thead>
<tr>
<th>Year</th>
<th>1552</th>
<th>1589</th>
<th>1670</th>
<th>1675</th>
<th>1705</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>116,666 akçe</td>
<td>90,009 akçe</td>
<td>1,000 guruş</td>
<td>1,000 guruş</td>
<td>1,000 guruş</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

\textsuperscript{427} For a similar approach that highlights the benefits of carbon, see William McDonough, “Carbon is not the Enemy,” \textit{Nature} 539 (17 November 2016): 349-351.

\textsuperscript{428} Sestini took note of the Basra saltworks during his trip in 1781. See Sestini, \textit{Voyage de Constantinople à Bassora}, 203.

\textsuperscript{429} BOA, TT 282, fol. 241; BOA, TT 534, fol. 6.
Farmers intended diversion canals to distribute water to river basins, but a wide range of organic and inorganic matter slipped through them, including salt. In more humid settings, frequent rains assisted farmers in washing out the accumulated salts and draining them back to the river and, ultimately, to the sea. In the arid Tigris-Euphrates alluvium, however, officials and farmers...
were deprived of rainfall’s draining effect and suffered additionally from the searing heat of summer season, when high evaporation rates quickly concentrated salt on the surface. Salinized soil did not prevent cultivation but placed a great pressure on the scale and quality of the region’s harvests and on farmers themselves. In addition to tilling the soil, they had to continuously leach, excavate, and fallow it.

**Conclusion**

Robert Adams once argued that the history of agriculture in the Mesopotamian alluvium, throughout its long historical record, could be viewed as an oscillation between strategies of maximization and flexibility. Maximizing strategies were in ascendancy when political conditions were stable and highly complex and centralized states, such as the Third Dynasty of Ur (2112-2004 BC) and the Sasanian Empire (224-651 CE), directly exploited arable lands through substantial investments in labor, draft animals, and tools. Flexible strategies, on the other hand, prevailed in times of prolonged political fragmentation and upheaval, such as the Isin-Larsa period (2004-1763 BC) following the breakdown of the Third Dynasty of Ur under the increasing pressure of Amorite nomadic invasions. In these conditions, smaller states tended to delegate the exploitation of arable lands to subjects through land grants and tenant farming.⁴³⁰

On the spectrum between these two poles, the early modern Ottoman period combined elements of both but stood closer to the flexible end, due to the alluvium’s position as a hotspot along the eastern frontier and the availability of safer and more attractive options for agricultural

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investment in Egypt, the Balkans, and Anatolia. Istanbul was committed to maintaining and, whenever possible, amplifying arrangements to cultivate the Tigris-Euphrates alluvial plain that predated the sixteenth century, thereby striking a balance between its economic, cultural, and geopolitical priorities. It recruited corps of hydraulic engineers, organized annual salt-clearing campaigns, and maintained a handful of saltworks and large irrigation canals. Nevertheless, irrigation in the region remained largely in the hands of kin groups and local communities that relied on their own resources to carry out the everyday tasks of agricultural life. Under such circumstances, practical and flexible schemes easier to manage by local effort, notably the short spur canal and water sweep, dominated the irrigation landscape. They did not fully exploit the available land and water but empowered Iraq’s agrarian order to endure in a politically volatile region and to better contain the ecological risks associated with perennial irrigation, such as enhanced sedimentation and soil salinization.

Because of the inherent instability of perennial irrigation’s artificial canals, agricultural subsistence in the alluvial plain, whether directed by the state or local effort, always remained “a system of low return and high risk” to the individual farmer. More environmentally sustainable were subsistence strategies that adapted to the natural flow regime instead of seeking to modify it, the subjects of the next two chapters.

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431 Adams, “Historic Patterns of Mesopotamian Irrigation Agriculture,” 2.
“At the heart of the secret of civilization lies the domestication of animals, training man unconsciously in the ways of government and control, adding a new tenderness and regard for life to his nature, guiding him from barbarism to civilization, and impelling him along the ascending pathway of humanity with a force he has been slow to recognize and acknowledge.”


Outside the settled, arable clusters watered by the Tigris and Euphrates lay the more arid parts of the alluvium, where biological activity was low and the stock of organisms limited. A variegated layer of native grasses, herbs, and flowers fluctuated over time and spread thinly across the open river plain, in sharp contrast to the densely-packed stands of cereal grains along streams and canals. The diversity, transience, and dispersal of this vegetation cover complicated the monitoring and assessment of the urban scribe and defied monopolization and rationing by any central authority. The inedibility of grass minimized the rewards of its appropriation.

Rural groups chiefly based on a family nucleus filled the void left by the functionaries of urban bureaucracy. Over millennia, they devised and honed a remarkable set of strategies designed to chase and exploit this frustratingly intractable flora, notably, through the intermediacy of gregarious, migratory mammalian herbivores, domesticated during the first few thousand years after the end of the last Ice Age. The husbandry and herding of ruminant animals, or pastoralism,

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evolved as the most viable economic activity in zones lacking irrigation and sufficient rainfall and operated as a rapid response system, finely tuned to seize hold of a fugitive resource such as pasture. Dependence on herds, in turn, transformed human social organization and conferred mobility, a condition borne out of the tension between the regular needs of the livestock for fodder throughout the year and the marked seasonality of plant growth. Under chronic shortages of labor and capital necessary to produce, harvest, and store fodder, seasonal migration was the best strategy for groups whose lives revolved around the welfare of their flocks.

This chapter focuses on the growth and exploitation of grass, among the most important plant associations in the botany of the Tigris-Euphrates alluvium. It reconsiders a fundamental premise in Ottoman historiography, that the empire was an agrarian polity, its political and economic expansion based on the pillars of the land grant (dirlik) and peasant household (çift hane). The assumption explains why the cultivation of grain crops has dominated Ottoman economic history, taking the spotlight from grass and other vegetation difficult to quantify and tax. In the words of one historian, “The Ottoman dream of a sedentary paradise with its regular,

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predictable revenues from pacific farmers had no place for pastoral nomads.”

The discussion herein demonstrates how Ottoman agrarian predilections could be tempered with realism in a peripheral zone such as Iraq, giving a free rein to a pastoral engine of economic development no less important than arable production, with grass (otlak) and tribe (cemaat) serving as its basis. The approach demonstrates the economic utility of grass and highlights the overlooked role of Ottoman pastoral tribes, not as warriors, purveyors of pack animals, or migrant workers, but as managers and modifiers of the natural environment. Animal (particularly sheep and goat) husbandry was an inherently unstable mode of production that demanded maximum flexibility. The tribe, with its network of relationships based on segmentary lineages, offered a sure and firm operational unit, an anchor for households regularly displaced in a world void of a stable territorial framework. Where the agrarian system failed, the triad of pastoralism, mobility, and tribalism

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the Middle Danube, 1526-1690 (Leiden: Brill, 2006); Wolf-Dieter Hütteroth and Kamal Abdul fattah, Historical Geography of Palestine, Transjordan and Southern Syria in the Late 16th Century (Erlangen: Fränkische Geographische Gesellschaft, 1977).

436 Rudi Paul Lindner, Nomads and Ottomans in Medieval Anatolia (Bloomington: Research Institute for Inner Asian Studies, Indiana University, 1983), 65.

triumphed and became an economic force to be reckoned with. They went hand in hand and formed a coherent package able to conquer all but the harshest landscapes.438

**The Hydro-Logic of Mobility**

German doctor and botanist Leonhard Rauwolff spent nearly two months in the spring of 1574 sailing down the Euphrates towards Baghdad. The journey afforded him time to observe the riparian vegetation as well as life in the desert, which seemed to him utterly preposterous. “But it is no wonder that the *Arabians* are so restless,” he wrote, “for they are full of Want and Nakedness, have not to fill their Belly, nor to cover their Body withal; besides, they have nothing else to do, and are used to idleness from their very infancy, and then because they hate to Work, they are forced to wander like Vagabonds from one place to another.”439 In other words, Arab tribesmen were “so restless” and mobile simply because they were lazy and, given their abject poverty, had nothing to lose by wasting their time wandering in the desert as vagabonds. Observing at a distance from a moving deck, Dr. Rauwolff was oblivious to the rules and aims underlying migration habits overland.

Not to be confused with wandering, pastoral mobility, along with its associated tents, hearths, and dunghills, was an organized social scheme regulated in the alluvium by the hydrologic algebra of the Tigris and Euphrates. Winter and spring floods acted as a centrifugal force on pastoralists and their herds, forcing them to withdraw to the safety of dry plains and deserts.

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between the rivers, along the southwestern flank of the Euphrates, and in the Zagros foothills east of the Tigris. By the time they arrive, these zones would reach their peak in forage production due to bursts of rainfall and favorable temperature, carpeting them with perennial herbs (e.g. bulbous bluegrass and sedge), annuals (e.g. mallow and little barley), and woody perennials (e.g. Haloxylon and Atriplex) that served as bountiful grazing grounds for livestock.  

When the Tigris-Euphrates floods subsided and most desert vegetation burned in the summer and fall, the rivers beckoned shepherds and flocks from all directions to converge back around the green pastures their receding waters left behind. These included Tamarix pentandra and Capparis spinosa on river banks and irrigation canals, young Phragmites communis and Typha angustata around marshlands, weeds and stubble of spring (legumes) and summer (Lotus tenuifolius, Bermuda, and Johnson grass) crops in cultivated fields, and camel thorn, Sueda, and Schanginia in salinized areas. Aside from forage, these often-neglected plants were sources of firewood, nitrogen-fixation, and fertilization. In 1781, the British East India Company servant Eyles Irwin summarized the annual pastoral calendar in the alluvium as follows: “[Spring] is the season, when the expected rising of the Euphrates and Tygris, drives the Arabs into the desart, to seek for pasture for their flocks. It is so designed by Providence, that the waste we have travelled over, shall become verdant in many places in another month. When the summer heats have burnt up the grass, the tribes return to the river, which has by this time shrunk to his former bounds.”

“This is the only variation in their pastoral lives,” he continued, “War and bloodshed give a different color to their political ones.”

This pastoral system (see Figure 31) suited the rivers’ flat alluvial plain, a landscape with minimal difference in altitude that could not support transhumance in the classical sense, with its seasonal movement between valley and hill. Like their counterparts in the Mediterranean coastlands, only herders in the mountainous north had the option of taking their flocks to hilltops during the spring and summer, where livestock would graze on nutritious high pastures that had enough time to grow after the winter snows had melted. Between rain-fed submontane plains and high summits, northern tribes including many Kurdish groups moved without regard to the tyranny of rivers and states in the valley. In contrast, the Tigris and Euphrates defined the rhythm of pastoral movement in the southern lowlands and enclosed herders and flocks within a horizontal

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442 Eyles Irwin, A Series of Adventures in the Course of a Voyage Up the Red-Sea, on the Coasts of Arabia and Egypt; and of a Route through the Desarts of Thebais, in the Year 1777: With a Supplement of a Voyage from Venice to Latichea; And of a Route through the Desarts of Arabia, by Aleppo, Bagdad, and the Tygris, to Busrah, in the Years 1780 and 1781, 3rd ed. (London: Printed for J. Dodsley, 1787), 2:312. Writing some fifteen years later, John Jackson, a British traveler, provides a partial description of the system, as it unfolded in the summer: “These people have numerous flocks of cattle, sheep, and goats, which they drive every morning at sun-rise to the river side, where they find very good pasture. They are watched all day by men, women, and children, who frequently amuse themselves by bathing in the river; for an Arab, when he has an opportunity, will bathe five or 6 times a day. The flocks are always driven back at sun-set to the villages, where they remain all night.” John Jackson, Journey from India Towards England in the Year 1797 (London: Printed for T. Cadell, Jun. and W. Davies, Strand, 1799), 17. Around the same period, French naturalist Guillaume Antoine Olivier (d. 1814) offers a brief summary of pastoral migration in the region, writing: “La population de cette partie de la Mésopotamie se réduit à deux ou trois villages situés sur le Tigre, et à quelques hordes peu nombreuses d'Arabes qui parcourent en hiver ces plaines, et y trouvent pour leurs troupeaux un pâturage, sinon abondant, du moins très-savoureux: ils s'approchent, l'été, des fleuves ou des lieux élevés de la seconds zône.” Guillaume Antoine Olivier, Voyage dans l’Empire Othoman, l’Égypte et la Perse: Fait par ordre du Gouvernement, pendant les six premières années de la République (Paris: Chez H. Agasse, 1804), 4:383. The annual growth cycle of pastures is described in D. Hywel Davies, “Observations on Land Use in Iraq,” Economic Geography 33, no. 2 (1957): 122-134, especially 125.
universe, a patchwork-quilt of sand and grass, wetland and dryland constantly rearranged by the rivers’ rise and fall. Every season, the Tigris and Euphrates opened certain areas for grazing in the alluvial plain and closed others. Because each zone was relieved from herbivory for a while every year, the broader landscape supported larger mammal populations than would otherwise be possible. Hungarian geographers working on the comparable Great Hungarian Plain, the Alföld, use the term “meadow transhumance” in reference to this river-dependent pastoral system.443

Figure 31. The Movement of Shepherds in the Tigris-Euphrates Alluvium


The roads of pastoral mobility were deeply carved into the Iraqi landscape. Unlike Egypt, constrained and protected by natural borders within the Nile Valley, the Tigris-Euphrates alluvium is geographically open to intrusion on all sides by mobile pastoralists coming from desert and mountain.\footnote{William C. Brice, \textit{South-West Asia} (London: University of London Press, 1966), 245; Hans J. Nissen and Peter Heine, \textit{From Mesopotamia to Iraq: A Concise History}, trans. Hans J. Nissen (Chicago: University of Chicago Press, 2009), 4; J. N. Postgate, \textit{Early Mesopotamia: Society and Economy at the Dawn of History} (New York: Routledge, 1994), xxii. Lewis Mumford argues that the Egyptian landscape had the features of a walled city, keeping Egyptians free from invasion with the natural ramparts of mountain, desert, and sea. The natural fortification of Pharaonic Egypt, he argues, explains why the region lacked actual walled cities comparable in grandeur to those that appeared in Mesopotamia. Lewis Mumford, \textit{The City in History: Its Origins, Its Transformations, and Its Prospects} (New York: Harcourt Brace Jovanovich, 1961), 81-85.} During the blistering heat of summer, the critical season when forage was an extremely scarce commodity and nearly depleted in the surrounding deserts, the Nile River swelled and closed Egypt’s gates to grazing. The subsiding waters of the Tigris and Euphrates, meanwhile, kept the vital summertime pass to Iraq open and bequeathed to pastoralists verdant green meadows, on which their flocks could subsist until winter’s first rains. The combination of open borders and stream hydrology turned Iraq into a theater on which one of the most epic plays of world history was staged in a most stirring form—the encounter between those who kept flocks, and those who worked the soil.

The calendar of their annual chores organized by the same fluvial force, pastoralists and farmers had to live in closer proximity than in most other places on earth. Sedentary enclaves existed within pastoral zones without broad natural boundaries separating them. Even by the standards of the Middle East, where both groups interacted so regularly, “what makes Iraq’s case unique,” a Middle East historian remarked, “is the intensity of the exposure and the swiftness of the oscillation.”\footnote{Rifaat Ali Abou-el-Haj, “The Social Uses of the Past: Recent Arab Historiography of Ottoman Rule,” \textit{International Journal of Middle East Studies} 14, no. 2 (1982): 185-201,} Physical proximity, conflicts of interest, and inveterate prejudices frequently
descended into outright wars between tribal confederations and states, the self-appointed ally and
guardian of the tax-paying peasant. Victories in battle and the remorseless destruction of the
pastoral enemy brought fame and distinction to Baghdad’s governors. Among them was Süleyman
Pasha (r. 1749-1762), a legendary figure who built his reputation on his ability to hunt down
tribesman during bloody night raids, a preoccupation that earned him the nicknames Abu Layla
(Father of the Night) and Dawwas al-Layl (Stomper of the Night). Symbolizing the ferocious
and gory relationship in the early nineteenth century were two pillars on each side of the road
leading out of Baghdad City, built of brick and inlaid with the heads of two hundred rebellious
tribesmen massacred by the Ottoman army.

Recurrent bloody episodes notwithstanding, the region’s fluvial landscape fostered a
cultural continuum between cultivator and herdsman unseen among Europeans and Indians,
Russians and Tatars, or Chinese and Mongols. In Iraq, they both spoke the same language,
professed the same religion, and sometimes even claimed the same tribal affiliation. “One brother often resides in a black tent and moves with the herds for the greater portion of the year while the other occupies a reed or mud-brick house and engages in cultivation,” according to Robert Adams. Every winter, an agricultural tribe could send a pastoral detachment in charge of taking flocks to better pasturelands in the desert, while the rest remained on irrigated fields engaged in the cultivation and harvest of wheat and barley. On return, flocks would graze within the boundaries of the tribal land. If not related, grain farmers negotiated with herdsmen and marsh dwellers seasonal grazing rights in return for rent, a share of the livestock’s dairy, meat, and textile products, the transportation of certain goods, or possibly news and information about the world around them. A coordinated visit by a flock of sheep generally benefited the land owner even when money and barter were not exchanged. Sheep droppings fertilized fields, and their grazing organically removed noxious vegetation that competed with crops and trees without resort to herbicides or machinery. These reciprocities strongly promoted economic diversity and encouraged the simultaneous pursuit of farming and herding within the same agricultural community, which often purposely devoted swaths of its arable lands to forage production. Passing by the Euphrates southwest of Baghdad in 1758, a British naval surgeon remarked: “All the country

449 The longevity of these arrangements, regulated by the laws of Hammurabi (d. 1750 BC) and witnessed by twentieth-century ethnographers, is a testament to the convenient rewards they yielded to farmer and herder. See Postgate, Early Mesopotamia, 158-159; Susan Pollock, Ancient Mesopotamia: The Eden That Never Was (Cambridge: Cambridge University Press, 1999), 70.
about us is neatly cultivated for pasturage, the river being with great care and judgment admitted, or shut out, agreeable to the necessity of the herdsman.”

The Tigris-Euphrates system was no less critical to mobile pastoralism than it was to irrigation agriculture in the alluvial plain. Its hydrology was the overriding natural force underpinning and governing both, pitting them against one another on some occasions and facilitating their peaceful coexistence on others. In fact, the twin rivers favored a pastoral way of life over other farming pursuits with a natural flow regime better synchronized with the needs of mammalian herbivores than those of winter grain crops. In other words, the average Iraqi pastoralist lived an easier life and enjoyed greater security from natural disaster than the average Iraqi cultivator. This is, perhaps, why Dr. Rauwolff claimed that Arab pastoralists “hate to Work,” largely because they did not have to toil away as much as those who tilled the land. Widespread claims that the Tigris-Euphrates floods are ill timed are, therefore, misleading, for they reflect the view of the grain farmer and not the shepherd.

_A Sheep-Shaped World_

In the desert tracts not reached by the Tigris and Euphrates, between the ruins of ancient cities and villages, only a few, tough species could survive the fierce competition over scarce and erratic

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451 Edward Ives, _A Voyage from England to India, in the Year 1754, and an Historical Narrative of the Operations of the Squadron and Army in India, under the Command of Vice-Admiral Watson and Colonel Clive, in the Years 1755, 1756, 1757; including a Correspondence between the Admiral and the Nabob Serajah Dowlah_ (London: Printed for Edward and Charles Dilly, 1773), 259.

452 Another reason that could explain Dr. Rauwolff’s misconceptions is that he came from a land with farmers but no mobile pastoralists.

453 This phrase is borrowed from Philip Armstrong, _Sheep_ (Reaktion Books, 2016), 79.
resources—the lion, jackal, eagle, hyena, and in antiquity the onager. Remarkably, the most celebrated character to thrive among those titans was sheep, first domesticated in the foothills of the Zagros Mountains some 10,000 years ago and thoroughly integrated into the economy of the Mesopotamian plain following its settlement in the early sixth millennium BC. From the repertoire of plants and animals they brought with them from the highlands, settlers of the alluvium ended up in an exceptionally happy marriage with *Ovis*, by virtue of its extraordinary versatility that allowed it to conquer continents and flourish in both scorching deserts and chilly mountaintops. Sheep’s hydrophilic, woolen coats insulate them against heat and cold through tiny pores that ventilate their bodies and trap moisture between fibers, effectively operating as a natural thermal regulator. Their relatively low water requirements (much less than cattle) made them better adapted to long-distance migration over rough pastures away from rivers and marshes under the searing heat of the sun. In addition, sheep are less disposed to fighting than pigs and easier to manage in large numbers. Making them even more amenable to large-scale management is their fondness of company and highly-developed flocking instinct behind a bellwether (often a black goat), a trait that greatly appealed to humans and, ironically, aroused their scorn, in their eyes proverbial for stupidity and lack of individuality. Few domestic animals satisfied as many of society’s needs as sheep, leading one scholar to make the bold (and exaggerated) claim that, “It is

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not too much of an exaggeration to say that the history of man is the history of sheep." Sheep offered blood, milk, wool, dung, meat, fat, bone, skin, horn, and gut.

Through these morphological, physiological, and behavioral adaptations, sheep triumphed in the hierarchy of life in Iraq, becoming its most important mammal in numeric and economic terms for most of the region’s recorded history. In the late sixteenth century, Ottoman surveyors accounted for some 1.1 million caprids (mostly sheep with a small proportion of goats) throughout Iraq and estimated that they would generate 1.4 million akçe, far greater than the bovid population combined (cattle and water buffalo) and its economic potential (see Tables 31, 32, 33).

Nearly 97 percent of the recorded sheep and goat population was owned by groups based in Baghdad’s drier river plain in the north, where larger herds thrived and enjoyed a greater range of movement than possible in the marshy delta plain of Basra.

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457 Ryder, Sheep & Man; Armstrong, Sheep.
458 Harriet Crawford, Sumer and the Sumerians, 2nd ed. (Cambridge: Cambridge University Press, 2004), 57-58; Postgate, Early Mesopotamia, 158-159. In the Ubaid period (5000-4000 BC), Pollock argues that “sheep and goats were little used, the emphasis being on cattle, pigs, and fish.” Pollock, Ancient Mesopotamia, 81. The triumph of sheep and goats appears to have occurred soon later following the development of specialized mobile pastoralism as a mode of production and the emergence of Mesopotamia’s textile industry during the late fourth millennium BC. See Lees and Bates, “The Origins of Specialized Nomadic Pastoralism,” 187-193; Joy McCorriston, “Textile Extensification, Alienation, and Social Stratification in Ancient Mesopotamia,” Current Anthropology 38, no. 4 (1997): 517-535.
459 By Mesopotamian standards, the caprid population of the Ottoman period, at least that recorded by Ottoman scribes, is modest. 2,350,000 sheep and goats are recorded during Ur III (2112-2004 BC). See Robert McC. Adams, Heartland of Cities: Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates (Chicago: University of Chicago Press, 1981), 149.
460 The division of the Tigris-Euphrates alluvium into a river plain and delta plain is detailed in Chapter 3.
Table 31. Cattle and Caprids in the Baghdad Province, c. 1580

<table>
<thead>
<tr>
<th>District</th>
<th>Region</th>
<th>Cattle Tax (akçe)</th>
<th>Cattle Population</th>
<th>Caprid Tax (akçe)</th>
<th>Caprid Population</th>
<th>Note on Caprids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firatiyyat Baghdad</td>
<td>Upper Euphrates</td>
<td>6,780</td>
<td>848</td>
<td>16,167</td>
<td>2,694</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Qaravul</td>
<td>Upper Euphrates</td>
<td>4,000</td>
<td>500</td>
<td>9,808</td>
<td>8,173</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Khalis</td>
<td>Diyala</td>
<td>10,548</td>
<td>1,319</td>
<td>13,043</td>
<td>10,869</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Mahrud</td>
<td>Diyala</td>
<td>4,054</td>
<td>507</td>
<td>4,811</td>
<td>4,009</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Tariq Khurasan</td>
<td>Diyala</td>
<td>4,896</td>
<td>612</td>
<td>5,758</td>
<td>4,798</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Shahraban</td>
<td>Diyala</td>
<td>4,720</td>
<td>590</td>
<td>5,400</td>
<td>4,500</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Mandalijin</td>
<td>Diyala</td>
<td>4,000</td>
<td>500</td>
<td>2,500</td>
<td>2,083</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Dujayl</td>
<td>Upper Tigris</td>
<td>7,182</td>
<td>898</td>
<td>6,833</td>
<td>5,694</td>
<td>Sheep and goats</td>
</tr>
<tr>
<td>Hilla</td>
<td>Middle Euphrates</td>
<td>7,626</td>
<td>953</td>
<td>8,415</td>
<td>16,830</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Nahr Najaf</td>
<td>Middle Euphrates</td>
<td>80</td>
<td>10</td>
<td>1,277</td>
<td>2,554</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Khalid</td>
<td>Middle Euphrates</td>
<td>-</td>
<td>-</td>
<td>12,587</td>
<td>25,174</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Kabsha</td>
<td>Middle Euphrates</td>
<td>-</td>
<td>-</td>
<td>21,872</td>
<td>43,744</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Malik</td>
<td>Middle Euphrates</td>
<td>-</td>
<td>-</td>
<td>31,473</td>
<td>62,946</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Zubayd Sharqi</td>
<td>Middle Euphrates</td>
<td>-</td>
<td>-</td>
<td>700</td>
<td>1,400</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Zubayd Gharbi</td>
<td>Middle Euphrates</td>
<td>-</td>
<td>-</td>
<td>9,391</td>
<td>18,782</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Ahshamat</td>
<td>Dispersed</td>
<td>122,189</td>
<td>15,273</td>
<td>874,200</td>
<td>728,500</td>
<td>Sheep only</td>
</tr>
<tr>
<td>Cemmasat</td>
<td>Dispersed</td>
<td>16,038</td>
<td>2,187</td>
<td>334,675</td>
<td>121,700</td>
<td>Sheep only</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>192,113</td>
<td>24,196</td>
<td>1,358,910</td>
<td>1,075,230</td>
<td></td>
</tr>
</tbody>
</table>

Note: To calculate animal populations, I divided the total tax estimate for each animal group by the tax rate for that animal mentioned in the district’s law code. When the tax rate is not mentioned in a particular district, I used the rate prevalent in the province.

Source: see Appendix A
Table 32. Cattle and Caprids in the Basra Province, c. 1590

<table>
<thead>
<tr>
<th>District</th>
<th>Cattle Tax (akçe)</th>
<th>Cattle Population</th>
<th>Sheep Tax (akçe)</th>
<th>Sheep Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheresh</td>
<td>-</td>
<td>-</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>Gharraf</td>
<td>-</td>
<td>-</td>
<td>42,500</td>
<td>26,563</td>
</tr>
<tr>
<td>Rahmaniyya</td>
<td>2,370</td>
<td>237</td>
<td>130</td>
<td>130</td>
</tr>
<tr>
<td>Medine-i Cezayir</td>
<td>4,000</td>
<td>400</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cezi-re-i Muharrari</td>
<td>-</td>
<td>-</td>
<td>983</td>
<td>983</td>
</tr>
<tr>
<td>Turre-i Cezayir</td>
<td>-</td>
<td>-</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,370</strong></td>
<td><strong>637</strong></td>
<td><strong>44,633</strong></td>
<td><strong>28,696</strong></td>
</tr>
</tbody>
</table>

Note: To calculate animal populations, I divided the total tax estimate for each animal group by the tax rate for that animal mentioned in the district’s law code. When the tax rate is not mentioned in a particular district, I used the rate prevalent in the province.

Source: see Appendix A

Table 33. Herbivores of the Tigris-Euphrates Alluvium, 1580-1590

<table>
<thead>
<tr>
<th>Mammal</th>
<th>Tax Potential (akçe)</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>198,483</td>
<td>24,833</td>
</tr>
<tr>
<td>Caprids</td>
<td>1,403,543</td>
<td>1,103,926</td>
</tr>
<tr>
<td>Water Buffalo</td>
<td>812,913</td>
<td>37,002</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Estimating the number of people engaged in sheep herding, one of the most popular economic activities in the region, is not more difficult than estimating the sheep population. The vast majority of rural households owned a flock of sheep usually mixed with some goats. Like Hungarian cattle traders in the Ottoman-Habsburg frontier, Iraqi farmers in the eastern frontier with Persia chose to invest in movable assets such as sheep and goats. In an active warzone, they could easily move their livestock if necessary ten miles a day to get away from approaching armies. Their crops, on the other hand, had to stay put and, if ripe, could easily be seized by soldiers.461

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Households recruited family members to graze their animals daily on fallow fields and young shoots within the village. If local pastures were not sufficient, herders had to travel considerable distances. Another option available to small farmers was to entrust a professional shepherd to tend to their flocks when nearby pastures ran low. Historians of ancient Mesopotamia have documented this practice relying on a large number of Old Babylonian contracts between sheep owners and herders that detail the composition of flocks and terms of employment.  

Sixteenth-century Ottoman archival sources hint at a similar arrangement between some urban families in Baghdad, which appear to have owned sheep as a form of capital, and shepherds and water buffalo herders, separately listed by scribes among the residents of several neighborhoods in the city. If seasonal employment was indeed what made those professional pastoralists appear in the crowded neighborhoods of Baghdad rather than its open markets, it would confirm earlier precedent and highlight another aspect of mobile pastoralism in the region—as a form of wealth management service for rich clients.

Three professional shepherd groups dominated the Tigris-Euphrates alluvium in the early modern period. The most formidable among them was collectively called the Ahşamat, a herders’ association of Arab, Türkmen, and Kurdish tribes set up by Ottoman authorities in the sixteenth

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463 TKG.KK, TT 29, ff. 9b-28a, 101b-104a, 198b. For a comparable case of animal ownership as a form of capital investment, see Alan Mikhail, “Animals as Property in Early Modern Ottoman Egypt,” *Journal of the Economic and Social History of the Orient* 53, no. 4 (2010): 621-652.
century to organize and regulate their sheep grazing activities. The group’s name is derived from the Persian word hasham, meaning attendant or, as Katib Çelebi tells his Turkish audience in a more forthright fashion, “it means nomads” (yani göcer olurdur).

Comparable to the Spanish mesta and Neapolitan dogana in the Mediterranean, the Ahşamat association operated as a migratory megapolis with some 12,000 taxpaying members in 1580, nearly double the taxpaying population living within the walls of Baghdad and Basra combined. They worked in seventy-three regiments in charge of grazing nearly 700,000 sheep, with an official called the “shepherd leader” (çoban beği) and later “Ahşamat commander” (Ahşamat Ağası) serving as points of contact between state and shepherds (see Tables 34 and 35).

Table 34. The Ahşamat Shepherds’ Association, 1540-1580

<table>
<thead>
<tr>
<th>Year</th>
<th>1540</th>
<th>1544</th>
<th>1580</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxpayers</td>
<td>-</td>
<td>11,603</td>
<td>12,134</td>
</tr>
<tr>
<td>Cattle Population</td>
<td>-</td>
<td>3,135</td>
<td>15,273</td>
</tr>
<tr>
<td>Cattle Tax (akçe)</td>
<td>-</td>
<td>63,945</td>
<td>122,189</td>
</tr>
<tr>
<td>Sheep Population</td>
<td>-</td>
<td>721,963</td>
<td>728,500</td>
</tr>
<tr>
<td>Sheep Tax (akçe)</td>
<td>-</td>
<td>866,280</td>
<td>874,200</td>
</tr>
<tr>
<td>Çoban Beği Tax (akçe)</td>
<td>-</td>
<td>164,059</td>
<td>192,300</td>
</tr>
<tr>
<td>Total Tax Potential (akçe)</td>
<td>284,996</td>
<td>1,160,175</td>
<td>1,337,225</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

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465 Katib Çelebi, Cihannüma (İstanbul: Darü’ï-Tibaatî’l-Amire, 1145/1732), 469.
467 BOA, HAT 395/20874A (1246/1830-1831). The Ahşamat commander played a leading military role in Ottoman campaigns against disobedient tribesmen. See BOA, HAT 773/36218 (19 RA 1242/21 October 1826).
Table 35. The Ahşamat Shepherds’ Association, 1660-1700

<table>
<thead>
<tr>
<th>Years</th>
<th>Households</th>
<th>Sheep Population</th>
<th>Cow Population</th>
<th>Water Buffalo Population</th>
<th>Tax Potential (gürüş)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1660-1661</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>38,434</td>
</tr>
<tr>
<td>1670-1671</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>40,000</td>
</tr>
<tr>
<td>1691-1692</td>
<td>2,965</td>
<td>36,828</td>
<td>2,445</td>
<td>1,586</td>
<td>30,074.5</td>
</tr>
<tr>
<td>1699-1700</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30,655</td>
</tr>
</tbody>
</table>

Note: Most figures include those pertaining to water buffalo herders.
Sources: see Appendix A

The second shepherd group was the Qara Ulus (Black People), a predominantly Kurdish confederation and one of the two largest in Anatolia, the other being the predominantly Türkmen Boz Ulus.⁴⁶⁸ In the sixteenth century, about 5,000 Qara Ulus taxpayers came from the north to graze some 120,000 sheep within the borders of Baghdad (see Table 36). Istanbul appointed a judge (kadi) on the Qara Ulus, who accompanied the tribesmen in their seasonal migrations and served as their point of contact with the central government.⁴⁶⁹ Smaller in size (850 taxpayers with 8,000 sheep and goats) was the third shepherd group based on the Euphrates west of Baghdad and called the Qara’ul, a Mongolian word meaning “vanguard” or “scout,” indicative of the role member tribes played during the Mongol period, for which they became famous ever after (see Table 37).⁴⁷⁰ Together, the Ahşamat, Qara Ulus, and Qara’ul constituted a quarter of Iraq’s

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⁴⁶⁸ Gülcü, “Osmanlı İdaresinde Bağdat,” 341-343; Halil İnalcık, “The Ottoman State: Economy and Society, 1300-1600,” in An Economic and Social History of the Ottoman Empire, 1300-1914, vol. 1, 1300-1600, ed. Halil İnalcık and Donald Quataert (New York: Cambridge University Press, 1994), 35; Kasaba, A Moveable Empire, 21.
⁴⁶⁹ We know about the Qara Ulus judge through his correspondence with the Imperial Council in Istanbul, conveying the grievances of his constituents against Ottoman agents. For an early example, see BOA, MAD 2775, p. 745 (16 C 973/8 January 1566). Other tribal groups had their own judges traveling with them. See Kasaba, A Moveable Empire, 24.
population and were estimated to generate five percent of the region’s tax revenues during the second half of the sixteenth century.

Table 36. The Qara Ulus Shepherds’ Association

<table>
<thead>
<tr>
<th>Year</th>
<th>1544</th>
<th>1670</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxpayers</td>
<td>5,195</td>
<td>-</td>
</tr>
<tr>
<td>Sheep Population</td>
<td>121,170</td>
<td>-</td>
</tr>
<tr>
<td>Sheep Tax</td>
<td>145,400 akçe</td>
<td>-</td>
</tr>
<tr>
<td>Çoban Beği Tax</td>
<td>19,376 akçe</td>
<td>-</td>
</tr>
<tr>
<td>Total Tax Potential</td>
<td>258,727 akçe</td>
<td>10,250 guruş</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Table 37. Qara’ul (Qaravul/Qaragöl) Shepherds’ Association

<table>
<thead>
<tr>
<th>Year</th>
<th>1538</th>
<th>1544</th>
<th>1577</th>
<th>1670</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxpayers</td>
<td>853</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cattle Population</td>
<td>500</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cattle Tax</td>
<td>4,000 akçe</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Caprid Population</td>
<td>8,173</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Caprid Tax</td>
<td>9,808 akçe</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Tax Potential</td>
<td>62,102 akçe</td>
<td>198,475 akçe</td>
<td>175,817 akçe</td>
<td>7,000 guruş</td>
</tr>
</tbody>
</table>

Source: see Appendix A

No matter how much they treasured the animal, lay and professional pastoralists rarely limited themselves to the tending and rearing of sheep. They oriented their mobility in support of other productive activities as well. The Ahşamat and Qara’ul raised cattle, which made a perfect herbivorous team with sheep due to complementary grazing habits borne out of anatomical difference. Broader muzzles and stiffer lips allow cows to graze taller pastures with their dexterous tongues, leaving behind the shorter grasses for the more selective sheep and goats to nibble at with their smaller mouthparts and cleft upper lips.471 For backyard birders, grazing sheep and cow on

471 Ryder, Sheep & Man, 5.
the same pasture is the equivalent of feeding goldfinch and cardinals from the same container, whose differential seed preferences (thistle for goldfinch, sunflower for cardinals) are directly related to the size and cracking power of their beaks. Beyond the pastoral economy, groups affiliated with the Ahşamat and Qara’ul appear engaged in the cultivation of marginal lands and harvesting wheat, sesame, and other crops throughout Baghdad. The decision to cultivate could be routine or in response to an emergency that destroys a group’s flock. In the 1550s, for instance, an Ahşamat affiliate called the Kuru-i Atiq settled in one of the lands endowed to the shrine of Abu Hanifa and established fields and orchards, a new life they started following the loss of their flocks.

Lastly, one of the activities mobile pastoralists between Baghdad and Damascus pursued was the collection of desert truffles, a species of the mushroom family distantly related to the far more prized variety in Europe. Ottoman scribes in Basra referred to it using both the Turkish name, domalan mantarı, and the colloquial Arabic one, fuqa'. Unlike cultivation in marginal land, truffle collection worked in perfect harmony with mobile pastoralism and caused minimal disruption to daily forage. Spring is the high season for both pastures and truffles in the desert, where they grow in tandem with each other, the latter usually hidden beneath squat rockrose bushes. Both grow following the first spring rains, but truffle needs lightning to strike and trigger the chemical reaction necessary for its development, earning it the nickname, “the potatoes of thunder.” In a good season, such as April 1774, Abraham Parsons noted that “truffles were found in such plenty that our cameliers and others diverted themselves with pelting each other with them

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472 TKG.KK, TT 29, ff. 36b-40b, 386b.
473 BOA, MD 24, no. 894, p. 327 (n.d.); TKG.KK, TT 29, ff. 196a-196b.
474 BOA, TT 534, p. 8.
on their journey."476 The sight of Arab tribesmen searching for, gathering, and selling truffles was common to foreign travelers.477 In the sixteenth century, truffle collectors had to give a quarter of every vezne (around 385 g) they stockpiled as a levy to the provincial administration.478 Packed with protein, the fungus served the role played by tofu in American cuisine, as a vegetarian meat substitute, and provided much needed emergency support to those lost in the desert. On their way to India around 1758, one Mr. Barton and his servant, robbed by bandits, had to walk bare-footed to Baghdad “without meeting with any other support than the Truffles of the Desert, that happened then to be in season, and which they found in great plenty.”479

No mammalian herbivore was as effective as sheep in surviving the environmental conditions of the Tigris-Euphrates alluvium and in unlocking the energy stored in its rich grasslands. They formed the basis of life for nearly a quarter of the region’s population and a critical asset for nearly every rural household. Even though it tended to center around the husbandry of sheep, mobile pastoralism was a diversified economy. Through tribal networks, it integrated grain cultivation. Other pursuits, such as the tending of cattle and the collection of truffles, were easily incorporated without stepping off the paths beaten by sheep and herder.

478 BOA, TT 534, p. 8. For vezne conversion, I relied on Halil İnalcık, “Weights and Measures,” in *An Economic and Social History of the Ottoman Empire*, xliii.
479 Ives, *A Voyage from England to India*, 233.
**Transformation**

By the middle of the seventeenth century, the alluvial plain’s pastoral landscape, as organized during the reign of Süleyman I, was largely intact. As late as 1670, revenues of the Baghdad province came from ninety-five towns, villages, markets, and other financial units called *mukata‘a*. The most lucrative among them was the Ahşamat herders’ association, generating a staggering figure of 40,000 *guruş*, double the amount all remaining ninety-four units could produce.\(^{480}\) In the Imperial Council’s words, the Ahşamat was Baghdad’s “largest and most profitable district in terms of population size, resources, and [other] benefits.”\(^{481}\) Likewise, the two other shepherd groups in the region, the Qara Ulus and Qara’ul, were financially significant, appearing fifth (10,250 *guruş*) and seventh (7,000 *guruş*) on the list of Baghdad’s revenue sources.

Two major events caused the Ottoman shepherd associations of Iraq, particularly the Ahşamat, to unravel in the late seventeenth century and become shadows of their former selves by the late eighteenth century. The first occurred in the context of the ecological crisis that unfolded after 1687 (the subject of Chapter 6), when the Baghdad Governor Ömer Pasha resorted to the Ahşamat’s wealth in his attempt to steer the province through a political and financial breakdown. As he exacted greater tribute from them, most shepherds from the Ahşamat group left their territories and sought refuge in different locations out of Iraq, aggravating the very problems Ömer Pasha was trying to solve.\(^{482}\) Other tribes did not surrender easily. They held their ground and took the advantage of the chaos to regroup into new and powerful confederations, thereby maximizing

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\(^{480}\) BOA, D.BŞM.BGH 1/17. By 1670, the Ahşamat included buffalo herders from the Cemmasat association, discussed in the following chapter.

\(^{481}\) BOA, MD 112, no. 1672, p. 302 (Evahir S 1114/17 July 1702).

\(^{482}\) BOA, MD 112, no. 1672, p. 302 (Evahir S 1114/17 July 1702).
their autonomy and evading the exactions of provincial administrations when possible. Chapter 7 tells the story of one of them.

The second event that undermined the Ottoman pastoral order in the alluvium was the rise of the fundamentalist Wahhabi movement in the central Arabia in the middle of the eighteenth century. Waves of central Arabian tribal groups had long migrated to the coastal and alluvial peripheries of Syria and Iraq for different reasons; the spread of Islam was a primary one in the seventh century. In the eighteenth century, numerous Arabian tribes fled north to escape the Wahhabi onslaught to bring about the submission of towns, villages, and tribal encampments to the new fanatical creed.483 Two major tribal groups arriving in Iraq since the second half of the eighteenth century were ʿAnayza and Shammar. By the middle of the nineteenth century, they numbered close to 300,000 and 100,000, respectively.484 The influx of the ʿAnayza, Shammar, and other tribal groups caused havoc in the Iraqi countryside as new arrivals vied for control of pasturelands and raided riparian towns and villages.

In the face of an ecological crisis and Wahhabi northward expansion, the Ahşamat, Qara Ulus, and Qaraʾul remained an integral part of the provincial administration of Baghdad until they were officially abolished in the nineteenth century with the introduction of the Tanzimat

reforms. The three Ottoman shepherd associations, however, grew weaker and operated in the shadow of more assertive and autonomous tribal confederations, such as the ‘Anayza and Shammar in the north and Zubayd and Bani Rabi’a in the south (see Figure 32). Increasing inflows of new tribal groups from central Arabia constituted a major boost to the pastoral sector of Iraqi and Syrian societies. This trend may explain why, by the late eighteenth century, Ottoman bureaucrats began using two new derogatory terms for Arab nomads in both regions in reference to their abundance—insects (haşarat) and locusts (çekirge).

Figure 32. Some of the Dominant Tribal Confederations in Iraq, 1834


486 IOR/L/P&S/9/98, James B. Fraser, “On the Present Condition of the Pachalik of Baghdad,” ff. 67a-123a (12 November 1834), especially ff. 71a-76b.
487 BOA, MD 166, no. 844, p. 375 (Evahir CA 1189/19 July 1775); BOA, HAT 396/20881C (21 ZA 1252/27 February 1837); BOA, HAT 396/20894C (23 S 1254/18 May 1838); BOA, HAT 448/23318A (3 S 1255/17 April 1839); Samuel Dolbee, “The Locust and the Starling: People, Insects, and Disease in the Late Ottoman Jazira and After, 1860-1940” (Ph.D. diss., New York University, 2017), 297-298. I am grateful to Sam for sharing his dissertation with me.
Conclusion

A renowned historian once wrote that “the Ottoman regime was incompatible with a nomadic economy and tribal customary law.”488 This chapter has demonstrated how the Ottoman state, grudgingly or otherwise, reconciled its agrarian preferences with those of mobile pastoralists in the Tigris-Euphrates alluvium for political and economic expediency. Istanbul managed and even augmented the pastoral economy by organizing most shepherds into broad associations. The apparatus of provincial government relied on pastoral subsistence strategies to reach the region’s least accessible and bio-productive zones and to dip deeper into their vegetative wealth. The exploitation of grass, it must be remembered, formed only one major area of common interest between state and tribe. Military considerations were part of the calculation as well. Collaboration yielded to Istanbul thousands of battle-hardened tribesmen who could be conscripted into the ranks of its land and naval forces, serving as warriors, oarsmen, and steersmen under the command of governors and admirals (Chapters 1 and 2). In return for their services, tribal chiefs obtained numerous privileges, including official recognition, land and tax collection grants, and protection that buttressed their legitimacy locally and enabled them to amass power and wealth in competition with their rivals. The relationship could be described as a symbiosis that worked to the advantage of both. However, the levers of imperial control could sometimes be burdensome, leading shepherds on numerous occasions to visit the Ottoman judge in Baghdad and other towns to complain about the abuse and humiliation they experienced at the long hands of government.

agents.\textsuperscript{489} When access to justice was no longer available in times of upheaval, Part III will show, pastoralists took matters into their own hands.

\textsuperscript{489} See, for example, BOA, MAD 2775, p. 745 (15 C 973/7 January 1566); BOA, MAD 2775, p. 860 (4 B 973/26 January 1566); BOA, MAD 2775, p. 1503 (27 L 973/17 May 1566); BOA, MAD 2931, p. 104 (10 ZA 1095/19 October 1684).
Chapter 5: Wetlands

“I stood watching the sun go down behind reedbeds that stretched to the world’s end. High overhead, banks of cirrus cloud, blown to tattered streams, ranged from ebony to flaming gold and the colour of old ivory, against a background of vermillion and orange, violet, mauve and palest green. From all around, as if the Marshes breathed, came the massed voices of frogs, an all-pervading pulse of sound, so sustained that the mind ceased to take note of it. More than any other, even than the crying of geese in winter, this was the sound of the Marshes.”


Wetlands occur in areas seasonally or permanently saturated with water, a middle world between terrestrial and aquatic ecosystems exhibiting features of both. Their soil is anaerobic similar to lakes and oceans, yet they harbor shrubs, trees, and other large plants found in grasslands and deciduous forests. Red maple, for example, dominates the Great Dismal Swamp in Virginia and North Carolina. The biological composition of wetlands is diverse and abundant, allowing subsistence to be spread across several food webs obtained through cultivation, breeding, fishing, and hunting. The peculiarity of this ecotone partly explains why it had, until recently, slipped through the cracks of the natural sciences and its divisions of labor, which left the disciplines bearing on it isolated in separate fields.490

The Tigris-Euphrates wetlands have experienced additional neglect by historians of the post-classical Middle East, who have been more preoccupied with arid deserts that presumably expanded under the hooves of mounted nomads charging from the east. “In an astonishingly short

period,” two scholars wrote about the aftermath of the Mongol conquests, “most parts of Iraq turned into desert.”491 “At the beginning of the early modern period,” according to another historian, “… desertification and recession had already occurred on a large scale, perhaps most notably in the alluvial plains of Mesopotamia (including Khuzistan).”492 This chapter challenges the desertification narrative by bringing to light the significance of wetlands to human settlement and subsistence. In fact, under the conditions of recurrent civil wars, nomadic onslights, and a volatile state of affairs that prevailed before the Ottoman conquest, rewilding on a flat river plain often took the form of wetland rather than desert formation. Unchecked seasonal and extraordinary floods turned fields and basins into new marshes and expanded old ones, restoring the natural ambiguity of water and earth in the alluvium.493 Other fluvial landscapes witnessed a comparable revival of their wetlands during periods of political disintegration, such as northern Italy’s Po Valley in the early Middle Ages following the dissolution of the Western Roman Empire.494 The discussion herein maps the extensive area occupied by marshes in the early modern Tigris-Euphrates alluvium and shifts the common focus on human drainage efforts to those that sought to tap into wetland wealth.

Hydrography

Different hydrologic pathways provide wetlands with water, including precipitation, surface runoff, groundwater, and tides. The predominance of one over the others depends on a wetland’s geomorphic setting and local climate conditions. The Iraqi marshes rely for their water inputs on the dispersal and overflow of the Tigris and Euphrates, processes made possible by a flat alluvial plain and human intervention. The level terrain south of the Samarra-Hit line reduces the velocity of flow and saps its kinetic force, making the river channels given to movement. They overspill and form marshes as they circulate within a web of interconnected major and minor branches, a pattern called anastomosing in geomorphological jargon.\(^{495}\) Jean-Baptiste Rousseau, the French consul in Baghdad (1796-1798), poetically described the fluvial process. The landscape was, he wrote, “furrowed by a multitude of small streams which, when detaching themselves from the Euphrates, meander in the plain, cut across, intermingle, and finally return to the river, like lovely children who diverge a little from their mother while playing, and then return to throw themselves into her arms.”\(^{496}\) The Iraqi marshes were the work of this caring mother, and in part the work of artificial irrigation canals that tended to allow more than the required amount of water to escape, feeding and maintaining small swamps in flood basins.\(^{497}\)

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Until the late twentieth century, the Tigris-Euphrates marshes were one of the largest in
the world, a giant aquatic complex that can be conveniently divided into three parts (see Figure
33). The core of the complex centered within and around the triangle between Kut, Nasiriyya, and
Basra. In administrative circles, a more common term was the Islands (Cevazir/Cezayir).

Feridun Bey (d. 1583), a protégé of Grand Vizier Sokullu
Mehmed Pasha, briefly described the general features of this marsh core based on reports received
from officials and troops once stationed in Basra. “There,” he wrote, “the water of the Euphrates,
the River of Baghdad [Tigris], and the rivers flowing in the environs blend together and splinter
left and right like irrigation ditches. As a result, the Islands comprise of 360 rivers, the local people
say.” The two remaining components of the marsh complex were centered around the Tigris and
Euphrates belts further north. Forming along the Tigris and its tributary the Diyala were a large
swamp in the Aqarquf depression (ancient Dur Kurigalzu) west of Baghdad and around sixty
smaller ones between Kadhimayn and Mada’in (ancient Ctesiphon) and near Qara Tepe.

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498 For a more detailed hydrography of the sub-units that comprise this marsh area, see Ali al-
Marsh Dwellers of the Euphrates Delta (London: Athlone Press, 1962), 5-8; Wilfred Thesiger,
Marshlands: Demise of an Ecosystem (Nairobi: United Nations Environmental Program, 2001),
11-15.

499 Sipahizade Mehmed Efendi, “Evdahu’l-Mesalik ila Ma´rifet’l-Büldan ve’l-Memalik,” British
Library, Add. MSS 23381, ff. 12a, 14a, 33a; Aşık Mehmed, “Menazirü’l-Avalim,” Süleymaniyeye
Kütüphanesi, Esad Efendi MSS 2421, fol. 76b.

500 Feridun Bey, Nüzhet-i esrarı’l-ahyar der-ahbar-i sefer-i Sigetvar: Sultan Süleyman’ın son
seferi, ed. H. Ahmet Arslantürk, Günhan Börekçi, and Abdulkadir Özcan (Istanbul: Zeytinburnu
Belediyesi, 2012), fol. 293b. Basra’s governor gives another estimate, informing Istanbul in 1565
that the southern marshes consisted of 300 rivers. BOA, MD 5, no. 353, p. 150 (19 RA 973/14
October 1565).

501 TKG.KK, TT 29, ff. 30a-33a.
Euphrates region near Hilla (ancient Babylon) and Rumahiiya (ancient Borsippa) was the site of some eighty small marshes.502

Figure 33. Ottoman Map of the Tigris-Euphrates Marshes, c. 1878

Source: BOA, HRT 515.

This network of interconnected lakes, back-swamps, and marshes, some permanent and many others seasonal, was integral to the Tigris-Euphrates system. It fluctuated in tandem with the rivers’ flood pulse and acted as a regulator of flow. In the spring, wetlands brimmed and expanded by absorbing excess runoff and storing it over some 10,900 square miles (the size of Massachusetts) on the plains. During the remainder of the year, they gradually released the waters

502 TKG.KK, TT 29, ff. 46a, 74b-75a, 235b-467b.
back to the trunk channels and shrank, reaching a minimum of 3,200 square miles in the fall.\textsuperscript{503} Through this cycle, Iraq’s marsh complex considerably reduced the risk of flood damage during peak flows, allowing farmers to deal more easily with the remainder it could not hold through retentional and diversional works. In addition, marshes provided an insurance against drought in the summer and years of low rainfall and cleansed polluted waters. If an artist were to draw the Tigris-Euphrates system in human form, marshes would be the body’s kidneys.

\textit{Settlement}

Its numerous benefits notwithstanding, the changing proportion of land to water from season to season had made the marshes profoundly unsettling to those who wished to settle, portrayed in an eighteenth-century Ottoman manuscript in the shape of two giant, octopus-like figures (see Figure 34).\textsuperscript{504} Only an intrepid minority was willing to take the risk of living under the constant threat of floods, storms, and other capricious hydrological forces.


Ottoman cadasters do not explicitly state whether a registered tribe or village lived in a marshland or not, so population estimates of marsh dwellers are difficult to come by. But modes of subsistence can serve as indicators of where people lived. As a rule, the water buffalo is a wetland’s signature, the only habitat where it could survive and remain productive in Iraq. The pages below will discuss at length water buffalo physiology as it relates to arid climates, but an important point to mention here is that water buffalo colonies recorded in the Ottoman registers were specifically tied to a still wetland ecosystem rather than just a running river or canal due to the disruption flowing water causes to the giant mammal’s placid temperament. Marsh households tended to pursue supplementary activities and accommodate them to the demands of buffalo husbandry, including cow rearing throughout Iraq, sheep herding in Baghdad, and rice and

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date palm cultivation in Basra. Inferring from these buffalo-centered subsistence packages, we find that roughly 18 percent (12,612 individuals) of Iraq’s taxpayers either lived or made a living in wetlands during the late sixteenth century (see Table 38). The percentage could be much higher given the fugitive habits of marsh dwellers and the difficulties of mapping and surveying their trackless boggy ground. The actual population reliant on the wetland sector of Iraq’s economy was probably no less than twenty percent, equivalent to that employed today in U.S. manufacturing, extraction, transportation, and crafts.506

<table>
<thead>
<tr>
<th>Taxpayers</th>
<th>Tax Potential (akçe)</th>
<th>Subsistence Package</th>
<th>District</th>
<th>Province</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,026</td>
<td>849,485</td>
<td>Water buffalo, sheep, and cow</td>
<td>Dispersed</td>
<td>Baghdad</td>
<td>This group is collectively called Cemmasat</td>
</tr>
<tr>
<td>2,274</td>
<td>306,488</td>
<td>Water buffalo, sheep, and cow</td>
<td>Khalid, Rumahiyya</td>
<td>Baghdad</td>
<td>A minority grew rice</td>
</tr>
<tr>
<td>1,557</td>
<td>68,404</td>
<td>Water buffalo, sheep, and cow</td>
<td>Kabsha, Rumahiyya</td>
<td>Baghdad</td>
<td>-</td>
</tr>
<tr>
<td>2,162</td>
<td>146,672</td>
<td>Water buffalo, sheep, and cow</td>
<td>Malik, Rumahiyya</td>
<td>Baghdad</td>
<td>-</td>
</tr>
<tr>
<td>377</td>
<td>17,802</td>
<td>Water buffalo, sheep, and cow</td>
<td>Zubayd Sharqi, Rumahiyya</td>
<td>Baghdad</td>
<td>-</td>
</tr>
<tr>
<td>351</td>
<td>21,868</td>
<td>Water buffalo, sheep, and cow</td>
<td>Zubayd Gharbi, Rumahiyya</td>
<td>Baghdad</td>
<td>-</td>
</tr>
<tr>
<td>223</td>
<td>185,285</td>
<td>Water buffalo, cow, date palm, and rice</td>
<td>Kil ve Kinbad</td>
<td>Basra</td>
<td>-</td>
</tr>
<tr>
<td>214</td>
<td>151,666</td>
<td>Water buffalo, cow, and rice</td>
<td>Qannasiyya</td>
<td>Basra</td>
<td>-</td>
</tr>
<tr>
<td>161</td>
<td>12,500</td>
<td>Water buffalo, cow, and rice</td>
<td>Akçe Kale</td>
<td>Basra</td>
<td>-</td>
</tr>
<tr>
<td>1,547</td>
<td>918,500</td>
<td>Not reported</td>
<td>Lake Hammar</td>
<td>Basra</td>
<td>Lake Hammar is a permanent marshland southwest of the Euphrates River</td>
</tr>
<tr>
<td>720</td>
<td>242,905</td>
<td>Water buffalo and rice</td>
<td>Dispersed</td>
<td>Basra</td>
<td>This group is collectively called Mi‘dan</td>
</tr>
<tr>
<td>12,612</td>
<td>2,921,575</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: This is a conservative estimate that does not include those who practiced any wheat and barley cultivation and those to whom sheep and cattle were more financially significant than the water buffalo.
Sources: see Appendix A

The marsh dwellers, whether or not twenty percent of Iraq’s population, lived in a world literally of their own making. People from different backgrounds constructed niches for themselves on small exposed surfaces that rise above the water and dot the landscape like “floating turtles’
backs.” 

“In former times,” Feridun Bey wrote, “everyone inhabited an island along with his family and followers.” Domenico Sestini noted in 1782 that “each [marsh] family has its enclosure and a garden: water from the river or canals serves to water them with ease.” Some of the settled islands were natural hillocks, others were manmade and called jibasha or dibin. A family staked out its artificial island by fencing the perimeter of the desired location with reed bundles, within which alternating layers of soil and rushes were amassed. The fencing reeds and more rushes would be added on top of the heap of earth and greenery once it rose above the water, before it was trampled down tightly and made into a compact and solid mound suitable for settlement. In the flood season, a family could raise the surface of its island floor by adding fresh rushes as needed. Mobility in this engineered archipelago relied on canoes (mashhuf and tarrada) about six feet long built out of local and imported timber.

Governing Iraq was difficult (Chapter 2), and governing its marshes especially so. On one hand, the Ottoman government was attracted to the income-generating capacity of marsh dwellers, estimated in 1580-1590 to be some 2.9 million akçe, nearly 9 percent of Iraq’s total potential revenues (Table 38). On the other hand, muddy grounds, demographic dispersal on small islands, and a highly mobile way of life adopted by the local inhabitants made proper tax assessment, let
alone collection, extremely onerous. In 1552, Ottoman scribes conducting the first detailed cadastral survey of the Basra province complained that many marsh dwellers were in a state of rebellion and could not be registered.\textsuperscript{512} To capture its share of their considerable wealth efficiently, the Ottoman administration organized one-fourth of marsh households (3,026 taxpayers) into a herders’ association called the \textit{Cemmasat}, or the Water Buffalo Breeders (see Table 39).\textsuperscript{513} The Cemmasat constituted a fiscal-administrative conglomerate, the size of Baghdad City’s entire subject population and the second most important herders’ association in the region after the Ahşamat shepherds (Chapter 4). Unlike the residents of Baghdad City, members of the Cemmasat did not share an alley or neighborhood. Most of them perhaps never met and did not know each other. What brought them together in one place as one group in the tax registers was not the town or village where they resided, as settled subjects were classified, but the black gold they owned—the water buffalo, each animal worth eight sheep or three cows in Ottoman provincial law.\textsuperscript{514}

\footnotesize
\textsuperscript{512} BOA, TT 282, ff. 214-215. \\
\textsuperscript{513} TKG.KK, TT 29, ff. 201b-215b. Officials registered the remaining three-quarters of marsh households in the locality where they settled, possibly due to the ease with which they could be located. For an introduction to the Cemmasat, see Erdinç Gülçü, “Osmanlı İdaresinde Bağdat (1534-1623)” (Ph.D. diss., Firat Üniversitesi, 1999), 334-335. \\
\textsuperscript{514} Regulations related to the Cemmasat group dictated officials to collect 22 akçe for each water buffalo, every eight sheep, and every three cows. TKG.KK, TT 29, fol. 215b.
Table 39. The Cemmasat Herders’ Association

<table>
<thead>
<tr>
<th>Year</th>
<th>1540</th>
<th>1544</th>
<th>1580</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>-</td>
<td>2,221</td>
<td>3,026</td>
</tr>
<tr>
<td>Bachelors</td>
<td>-</td>
<td>587</td>
<td>-</td>
</tr>
<tr>
<td>Buffalo Population</td>
<td>-</td>
<td>17,881</td>
<td>19,134</td>
</tr>
<tr>
<td>Cow Population</td>
<td>-</td>
<td>1,544</td>
<td>2,187</td>
</tr>
<tr>
<td>Sheep Population</td>
<td>-</td>
<td>4,222</td>
<td>121,700</td>
</tr>
<tr>
<td>Buffalo Tax (akçe)</td>
<td>-</td>
<td>393,382</td>
<td>420,942</td>
</tr>
<tr>
<td>Cow Tax (akçe)</td>
<td>-</td>
<td>11,330</td>
<td>16,038</td>
</tr>
<tr>
<td>Sheep Tax (akçe)</td>
<td>-</td>
<td>5,146</td>
<td>334,675</td>
</tr>
<tr>
<td>Total Revenues (akçe)</td>
<td>142,001</td>
<td>416,282</td>
<td>849,485</td>
</tr>
</tbody>
</table>

Sources: see Appendix A

The broad outlines of the Cemmasat’s history as an Ottoman organization are similar to that of the Ahşamat shepherds’ association based in grasslands (Chapter 4). In the sixteenth century, the Cemmasat witnessed unabating growth in their numbers and in the size of their herds. Within forty years, their revenue-generating capacity climbed six-fold (Table 39). Members of the Cemmasat were subsumed within the Ahşamat group during the seventeenth century, making both groups the most profitable administrative unit in the Baghdad province.\(^{515}\) The same ecological and political forces that caused the Ahşamat shepherds to disband after 1687 took their toll on the Cemmasat buffalo herders as well. By the eighteenth century, the Cemmasat association, the distinctive feature of the Ottoman political order in the marshes, was eclipsed by a more fragmented order dominated by numerous tribal sheikhs, with whom provincial authorities had to negotiate individually on an ad hoc basis.

A considerable segment of the alluvial plain’s population defied the instability of wetland ecosystems and settled in or near one. The Ottoman bureaucracy went to great pains to track, assess, and tax their substantial wealth and sought to facilitate its task by organizing a fourth of

\(^{515}\) BOA, D.BŞM.BGH 1/17; BOA, D.BŞM 976; TSMA, E.5852; TSMA, E.9508. See also Chapter 4.
marsh households into a water buffalo herders’ association. Scholars emphasize the similarities in the utilization of marshes in modern and ancient times, but the high percentage of people that opted to live in marsh areas on the eve of the Ottoman conquest was likely the culmination of a recent population movement that began in the late Middle Ages, driven by the desire to avoid the manifold afflictions of violence and political chaos.516

**Disease**

Two aspects of the Tigris-Euphrates marshes aroused outsiders’ disgust: a “bad effluvia” that impregnated the air and a relentless assault by clouds of mosquitoes.517 In the Ottoman period, one of the earliest documented complaints about health hazards in the marshes is a letter sent by the governor of Basra in the spring of 1560 to his superiors in Istanbul informing them that “heavy air” (*heva-i sakil*) had killed an unspecified number of his troops and left others bedridden.518 Written sources of this kind, largely the legacy of agrarian societies that clung to drier zones, have given currency to the common portrayal of wetlands in scholarly discussions as diseased ecosystems unfit for human settlement.519 This view is particularly prevalent in Mediterranean

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516 For authors who trace Marsh Arab subculture to Sumerian and Babylonian times, see Salim, *Marsh Dwellers of the Euphrates Delta*, 8; Young, *Return to the Marshes*, 33-64.
517 Pedro Teixeira, *The Travels of Pedro Teixeira*, trans. William F. Sinclair (London: The Hakluyt Society, 1902), 29; Abraham Parsons, *Travels in Asia and Africa* (London: Longman, Hurst, Rees, and Orme, 1808), 157; Sestini, *Voyage de Constantinople à Bassora*, 203; Edward Ledwich Mitford, *A Land March from England to Ceylon Forty Years Ago* (London: W. H. Allen & Co., 1884), 1:312. A visitor in the early twentieth century remarked that Basra’s “European inhabitants only remain alive during the day through a perception of the humour of their situation, and by night through the agency of the prayers of their despairing relatives—for Bussorah has the most malarial air, the most choleric water, and the most infernal climate of any spot in the world outside Tophet.” David Fraser, *A Short Cut to India: The Record of a Journey along the Route of the Baghdad Railway* (London: William Blackwood and Sons, 1909), 258.
518 BOA, MD 3, no. 1021, p. 346 (3 $ 967/29 April 1560).
519 For works on Iraq that link marshes to plague, malaria, and cholera, see Tom Nieuwenhuis, *Politics and Society in Early Modern Iraq: Mamluk Pashas, Tribal Shayks and Local Rule*
historiography and in part explains the field’s fascination with highlands and their role as sites of asylum from “the unhealthy vapors of the swampy and fever-ridden lowlands.”\textsuperscript{520} In the words of Fernand Braudel, on the flat Mediterranean plains, “water is synonymous with death.”\textsuperscript{521} Iraq offers a counterexample to this stereotype and demonstrates how still water on a flat plain could be synonymous with life. As detailed above, imperial records bear witness to a large population that relied on marsh environments for settlement and subsistence. It thrived and accumulated wealth despite the health hazards due in no small part to a fortuitous defense system, partly natural and partly human, that degraded the lethality of malaria in the marshes.

The ecology of Iraq formed the first line of defense against malaria and reduced the efficiency of its transmission. It did so by breaking up the nexus between heat, humidity, and rain on which the malaria parasite relies. During the warmer months of the year, when mosquito hosts (female anopheles) grow and multiply, Iraq experiences intense desiccation that minimizes the water budgets of the Tigris, Euphrates, and their marshes, leaving vector populations with minimal water that they would need to thrive and breed. When winter rainfall and spring snowmelt bring high water to the rivers and their marshes, average temperatures fall below those favorable to mosquito breeding. This balance between hot and cold, wet and dry conspired against the malaria parasite’s life cycle and made its completion more difficult in Iraq than in other tropical and

\begin{flushright}
\end{flushright}
subtropical countries. The dominant mosquito species that could endure the frustrating ecology of the Iraqi marshes was *Anopheles pulcherrimus*, a poor carrier of malaria.\(^{522}\)

Human biology possibly created another defense line against the proliferation of malaria in the marshes. Three archaeologists have recently hypothesized that Mesopotamia’s local population may have developed genetic shields after many generations of exposure to malaria and other infections since the early development of Sumerian agriculture in the Neolithic period.\(^{523}\) Heritable traits aside, people could acquire resistance by surviving repeated outbreaks of the deadly disease.\(^{524}\) Wilfred Thesiger, who operated as a roving doctor in the marshes during the 1950s, was surprised to find among locals only a few cases of malaria, most of which, he believed, were contracted outside the region. This observation led him to the conclusion that most marsh dwellers acquired some immunity to the major endemic diseases they encountered.\(^{525}\) “It is a case of the survival of the fittest,” a British military officer and his wife wrote of life in the marshes.


during the early twentieth century, “for the infant mortality is appalling; but those who survive to maturity have hardened in the process.”

Lastly, even though ignorant at the time of the vectors behind malaria transmission, marsh dwellers took general preventive measures against biting flies that inadvertently restricted the spread of malaria. A basic step involved the construction of huts in the open water away from reed beds, where insects converged in great numbers. A more sophisticated plan of action deployed buffalo dung, easily and cheaply available to every household. When lit and allowed to smolder, the manure produced thick billows of acrid smoke that kept mosquitoes at bay.

Ecology, resistance, and dung smoke reduced the threat of malaria but failed to keep out other risks to health and safety. Sanitary conditions were poor, particularly during the spring, when rising marsh waters mixed drinking water supplies with excrement. Dysentery and bilharzia, among other complaints, were not uncommon. No less threatening to human settlement was the constant threat of wild boar, in the words of a British traveler in 1797, “of such extraordinary size, that at first sight I could scarcely believe they were hogs.” Many averaging three to four feet at the shoulder and weighing 300 pounds, they thrived among reed beds. Muslim populations refrained from consuming boar meat, giving the swine free rein to devastate rice crops and to

526 Fulanian, The Marsh Arab: Haji Rikkan (Philadelphia: J. B. Lippincott Company, 1928), 21. The actual authors are S. E. and M. E. Hedgecock, who used the pseudonym due to prohibition on publishing books under their name during their tenure in uniform.
527 Maxwell, A Reed Shaken by the Wind, 60.
528 Edward Ochsenschlager, Iraq’s Marsh Arabs in the Garden of Eden (Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology, 2004), 194; Young, Return to the Marshes, 42; Maxwell, A Reed Shaken by the Wind, 66.
smash to pieces anyone who happened to stand in the way.\textsuperscript{531} No human genes or dung fumes that restricted malaria transmission could repel the veritable scourge of wild boar, nor were clubs and spears effective in containing its threat on a long-term basis. Only the proliferation of firearms and ammunition since World War I could give locals the means to bring the animal to the brink of extermination.

Infections, diseases, and vermin exasperated many, but did not deter the settlement and exploitation of the marshes. They merely stowed population growth, the same way they operated in other epidemiologically challenging environments, such as urban centers. Natural processes and social initiatives conspired to allow nearly a fifth of the alluvium’s population in the late sixteenth century to call the marshes home.

\textit{Soil}

Wetland soil exerts a major stress on the productivity and development of living organisms. Saturated with water, soil pores lack oxygen and are incapable of meeting the demands of most rooted plants for respiration. Anaerobic conditions explain why agrarian states until the late twentieth century had viewed wetlands as impediments to agricultural growth and devised incentives rewarding their drainage and destruction. The Ottoman state might have liked to see all of Iraq’s soil drained and put under the plow, but it lacked the means to carry out the enormous task on its own. Instead, it rewarded those who did. In 1552, for instance, one Khawaja Fayyad paid the Basra administration 16,000 akçe to acquire the title deed of an abandoned marsh island, increasing its value threefold after five years of hard work.\textsuperscript{532} In another case from 1578, an

\textsuperscript{531} Young, \textit{Return to the Marshes}, 165-167; Thesiger, \textit{Marsh Arabs}, 139, 187; Maxwell, \textit{A Reed Shaken by the Wind}, 171-179.
\textsuperscript{532} “Hüküüname Mecmuası,” TSMK, Koğuşlar 888, fol. 56b (11 S 959/6 February 1552).
Ottoman mercenary (gönüllü) from Herzegovina by the name Mehmed brought a marshland in the Diyala River’s Khalis district under cultivation during his deployment to Baghdad. The Baghdad Treasury awarded him a title deed for a payment of 1,000 akçe and reduced annual tax rate of one-eighth on his harvest.⁵³³

Absent enterprising individuals like Khawaja Fayyad and Mehmed the Herzegovinian, the Ottoman provincial administration altered its approach to hydric soils. It brought under its purview and thereby taxed the produce of two traditional forms of cultivation that could occur in marshlands. The first form of cultivation occurred on the edges of perennial marshes void of vegetation and deployed extensive farming techniques that obtained a relatively low yield from large areas. The agricultural operation required minimal inputs of labor, for the overflow and retreat of marsh water did most of the work to fertilize those edges and turn them into a moist surface of clay or loam. Farmers simply scattered seeds into cracks, natural furrows in the ground created as surface soils dried out. If not picked up by birds, the seeds took root. In non-cracked smooth areas, farmers took the additional step of plowing the soil with a crooked stick dragged by two draft animals.⁵³⁴ Irrigation required the maintenance of an embankment to retain the waters and inundate agricultural plots as needed.⁵³⁵ Both winter and summer crops, including wheat and barley, could grow in modest amounts on these marsh margins, whose formation relied on the annual Tigris-Euphrates flood pulse. Some of them could only form in the aftermath of rare flood

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⁵³³ TKG.KK, TT 29, fol. 75a. For other cases of marsh reclamation, see TKG.KK, TT 29, fol. 435b; BOA, C.ML 118/5267 (12 R 1214/12 September 1799).
⁵³⁴ One of the earliest and most detailed accounts of cultivation on marginal marsh areas is provided by J. Baillie Fraser, *Travels in Koordistan, Mesopotamia, & c., including an Account of Parts of Those Countries hitherto Unvisited by Europeans with Sketches of the Character and Manners of the Koordish and Arab Tribes* (London: Richard Bentley, 1840), 2:77-78, during his tour in Iraq in 1834-1835.
⁵³⁵ BOA, MAD 2926, p. 167 (27 L 1093/28 October 1682).
events that occurred once every five to ten years. Because of its reliance on the chances of flood and water recession, cultivation was a riskier and less profitable venture on marshland than on dryland. For instance, Baghdadi officials estimated in 1763 that the annual harvest of the Yusufiyya, Rahmaniyya, and Juwaymisa marshes oscillated between 245 and 50 guruş in years of high and low flood on the Tigris.

The provincial administration treated a marsh where this form of cultivation took place as a taxable agricultural unit, referred to in the registers of Baghdad as hor. It occurred in deep basin depressions and was usually uninhabited or temporarily settled, serving as a satellite exploitation area for nomadic groups and nearby settlements located on more elevated grounds. In this respect, Iraq’s hor was comparable to common forms of marginal land in other agrarian settings, such as gastinae in medieval Europe and mezraʿa throughout the Ottoman Empire. Provincial authorities took pains to squeeze as much money out of marsh agriculture and auctioned

536 TKG.KK, TT 29, fol. 33a. In the late sixteenth century, a man named Sayyid Zayn ad-Din Qadiri in control of two marshes on the Tigris near Baghdad informed the Ottoman administration that cultivation on his marshes relied on Tigris floods that occurred only once every five to six years. He used the harvest to support his family and donated the rest to the poor. See TKG.KK, TT 29, fol. 33b.
537 BOA, D.BŞM.BGH 3/36 (6 RA 1177/14 September 1763). For comparable cases, see BOA, D.BŞM.BGH 3/54 (15 S 1182/30 June 1768); BOA, D.BŞM.BGH 4/6 (21 S 1190/4 October 1776); BOA, D.BŞM.BGH 4/21 (1 M 1191/10 February 1777).
538 TKG.KK, TT 29, ff. 30a-33b, 46a, 74b-75a, 235b, 241a, 248a, 259a, 264a, 269b, 271b, 280b-281b, 292b-301b, 325b, 331a-331b, 345b, 356a, 359a, 361a-361b, 418a-425a, 435a-441b, 455b-467b.
539 Piet Buringh, Soils and Soil Conditions in Iraq (Baghdad: Ministry of Agriculture, 1960), 151.
540 For a detailed discussion of mezraʿa, see Halil İnalcık, “The Ottoman State: Economy and Society, 1300-1600,” in An Economic and Social History of the Ottoman Empire, 1300-1914, vol. 1, 1300-1600, ed. Halil İnalcık and Donald Quataert (New York: Cambridge University Press, 1994), 162-167. The comparison between mezra a and gastinae is made by Tabak, The Waning of the Mediterranean, 275-282.
off abandoned marshes to make sure no land with a capacity for production remained idle.\textsuperscript{541} A portion of their revenues supported the holy shrines of Karbala, Najaf, and Kadhimayn and the Marjaniyya religious school in Baghdad.\textsuperscript{542}

The other form of cultivation that the Iraqi marshes supported, more intensive than the first type, involved rice, which coped with low oxygen levels in marsh soil through its unique roots, equipped with a porous tissue full of air spaces (\textit{aerenchyma}) that facilitates the diffusion of oxygen from the aerial shoot into the buried root. The crop was a latecomer to Iraq; the earliest textual and archaeological evidence for its presence in Mesopotamia dating to the first half of the first millennium BC.\textsuperscript{543} By the sixteenth century, it was Iraq’s most important summer crop, estimated to generate some ten percent of the region’s potential tax revenues (Tables 40 and 41). Rice production in the Baghdad province occurred in two main agricultural zones: the Diyala plain northeast of Baghdad and Rumahiyya on the Middle Euphrates.\textsuperscript{544} Together, their production could not rival that of Basra, which produced more than double Baghdad’s rice harvest.

\begin{flushright}
\textsuperscript{541} BOA, MAD 2926, p. 167 (27 L 1093/28 October 1682); BOA, MAD 9968, p. 235 (24 C 1163/30 May 1750); BOA, D.BŞM.BGH 3/26 (5 S 1176/25 August 1762); BOA, D.BŞM.BGH 4/60 (23 S 1199/30 June 1785).
\textsuperscript{542} TSMA, D.3660, 37-41; TKG.KK, TT 29, ff. 30a, 33a.
\textsuperscript{544} For a case involving the reclamation of an abandoned rice paddy in Rumahiyya by the sheikh of the ‘Ubada tribe, see BOA, MAD 2737, p. 175 (1 L 1062/4 September 1652).
\end{flushright}
Table 40. Rice Production in the Baghdad Province, c. 1580

<table>
<thead>
<tr>
<th>District</th>
<th>Agricultural Zone</th>
<th>Tax Potential (akçe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halis</td>
<td>The Diyala Plain</td>
<td>157,529</td>
</tr>
<tr>
<td>Shahrbaban</td>
<td>The Diyala Plain</td>
<td>67,690</td>
</tr>
<tr>
<td>Mahrud</td>
<td>The Diyala Plain</td>
<td>44,511</td>
</tr>
<tr>
<td>Tariq-i Khurasan</td>
<td>The Diyala Plain</td>
<td>35,483</td>
</tr>
<tr>
<td>Khalid</td>
<td>Rumahiyya</td>
<td>553,630</td>
</tr>
<tr>
<td>Zubayd Sharqi</td>
<td>Rumahiyya</td>
<td>116,460</td>
</tr>
<tr>
<td>Kabsha</td>
<td>Rumahiyya</td>
<td>93,650</td>
</tr>
<tr>
<td>Malik</td>
<td>Rumahiyya</td>
<td>29,050</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>792,790</strong></td>
</tr>
</tbody>
</table>

Source: see Appendix A

Table 41. Rice Production in the Basra Province, c. 1590

<table>
<thead>
<tr>
<th>District</th>
<th>Tax Potential (akçe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimal</td>
<td>499,715</td>
</tr>
<tr>
<td>Waqi</td>
<td>178,400</td>
</tr>
<tr>
<td>Remle</td>
<td>173,416</td>
</tr>
<tr>
<td>Tawil</td>
<td>170,000</td>
</tr>
<tr>
<td>Kil we Kinbad</td>
<td>158,000</td>
</tr>
<tr>
<td>Janub</td>
<td>140,756</td>
</tr>
<tr>
<td>Qurna</td>
<td>125,800</td>
</tr>
<tr>
<td>Rahmaniyya</td>
<td>111,000</td>
</tr>
<tr>
<td>Mi’dan</td>
<td>111,000</td>
</tr>
<tr>
<td>Qannasiyya</td>
<td>110,980</td>
</tr>
<tr>
<td>Abu Araba</td>
<td>104,900</td>
</tr>
<tr>
<td>Cezire-i Muharrari</td>
<td>93,535</td>
</tr>
<tr>
<td>Kapan</td>
<td>88,200</td>
</tr>
<tr>
<td>Bani Mansur</td>
<td>87,215</td>
</tr>
<tr>
<td>Iskele-i Aqqara</td>
<td>86,588</td>
</tr>
<tr>
<td>Madine-i Cezayir</td>
<td>84,000</td>
</tr>
<tr>
<td>Sheresh</td>
<td>70,000</td>
</tr>
<tr>
<td>Akçe Kale</td>
<td>55,000</td>
</tr>
<tr>
<td>Sadr Süveyb</td>
<td>30,000</td>
</tr>
<tr>
<td>Hammar</td>
<td>18,000</td>
</tr>
<tr>
<td>Zakiyya</td>
<td>15,800</td>
</tr>
<tr>
<td>Gharraf</td>
<td>8,000</td>
</tr>
<tr>
<td>Ashar</td>
<td>80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,520,385</strong></td>
</tr>
</tbody>
</table>

Source: see Appendix A
Because of the crop’s semiaquatic properties, rice cultivation was confined to marshlands and some canals, the only areas in Iraq where the grass could find large and assured supplies of water during the summer months. For a week before sowing, rice seeds had to be soaked in water and laid in the sun until they began to germinate. Meanwhile in April, farmers cleared the ground and made low-earth dams called berms to divide fields into blocks. When the rivers subsided beginning in late May, farmers transplanted the young shoots into the rich silt carried to the fields by the river floods. The crops required constant watering, needs met through an irrigation system of controlled inundations whereby dam breaches were opened and closed after obtaining sufficient amounts of water. The harvest season occurred anytime between June and October, depending on crop quality and local conditions. For the considerable attention and care it received, rice gave in return a major boost to human diet and nutrition. Even after milling, a process that significantly reduces its vitamin and iron content, rice alone could meet the daily needs of laboring adults for carbohydrate and protein.

Farmers worldwide have historically harvested food from wetlands, including cranberries from bogs in Massachusetts and salt hay from fens in the British Isles. In Iraq, farmers managed to bring the anaerobic soil of the Tigris-Euphrates marshes under cultivation through two forms of

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545 On the significance of silt to rice cultivation in Iraq, S. E. and M. E. Hedgecock wrote in the early twentieth century: “To the rice cultivator the amount of silt brought down by the river means as much as his rainfall to the growing of wheat and barley, for the yield of the crop varies in direct proportion to the depth of the silt deposit in which the rice is planted.” Fulanian, The Marsh Arab, 124-125.
agriculture. The first was extensive and involved the cultivation of grain crops such as wheat and barley on marsh margins. The second was intensive rice cultivation and relied on copious water supplies in the marshes for irrigation during the summer. Marsh agriculture was extremely important to both local farmers and the Ottoman administration. Rice, in particular, made a highly nutritious foodstuff and was Iraq’s most lucrative crop bar none, estimated to yield more revenues than either wheat or barley in the late sixteenth century.

**The Water Buffalo**

Dolphins, seals, and walrus are aquatic mammals, but none of them call the shallow waters and dense thickets of a typical Iraqi wetland home. These environmental constraints explain why Ottoman officials portrayed the Iraqi marshes as so impenetrable that “no elephant can rip open [the thickets] and [where] a snake cannot pass” (*fil sökmêz yîlan geçmez*). In the words of an ethnographer in the twentieth century, “Here in the limitless stubble of pale bulrush, one felt that no sheltering ship could sail nor human foot walk, and there seemed no refuge for any creature whose blood was warm.” Only a couple of large mammals with a thick skin (literally and figuratively) could defy such constrictions and force their way into a wetland to live, the largest of which is the hippopotamus found in African wetlands. In the Iraqi marshes, the largest mammal to succeed and thrive has been the water buffalo. Narrow waterways choked with vegetation could not intimidate those powerful swimmers. In fact, a water buffalo, like the alligator and hippo,

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549 Maxwell, *A Reed Shaken by the Wind*, 32.
behaved as a self-propelled aquatic mower, leisurely lunging through the brittle tangles of reed and sedge and leaving behind new, cleared watery lanes for canoes to use.\textsuperscript{550}

The precise details of the water buffalo’s arrival in Mesopotamia are lost in the mists of time. It could have been indigenous to the region or introduced from the Indus Valley as early as the fifth millennium BC. The bovine never played a significant role in the Sumerian and Akkadian economies, which relied more heavily on four other domesticates: sheep, goats, cows, and pigs.\textsuperscript{551} Moreover, like the horse in North America some 10,000 years ago, the Mesopotamian water buffalo seems to have gone extinct around 2000 BC, only to be reintroduced during the Umayyad period (661-750) in the aftermath of the Muslim conquests of the Indus Valley.\textsuperscript{552}

The reintroduction of the water buffalo to Iraq was likely a slow and gradual process. By the time the Ottoman Turks arrived in the country, the mammal was a formidable rival to other ungulates, second in economic significance after the sheep. By a conservative estimate, the alluvial plain’s water buffalo population in the sixteenth century (36,078) was close to that of modern Iraq during the early twentieth century (52,211) (see Tables 42 and 43).\textsuperscript{553} If we are to believe Jean-Baptiste Tavernier, the water buffalo population in 1652 was nearly three times higher (144,000)
than twentieth-century levels.\textsuperscript{554} Maintaining large flocks of water buffalo was made possible in part due to the ability of small children to herd them. After a week or two of gentle handling, during which these sensitive and docile animals were groomed, massaged, hand-fed, and became accustomed to the sound of their owners’ human voice, in speech and song, they were remarkably tame. Traveling on the upper Tigris in the early 1660s, Jean de Thévenot observed: “I saw an experiment of the dexterity the People of the Countrey have to cross the water without a Bridge. I perceived forty or fifty the Buffles driven by a Boy stark naked, who came to sell the milk of them; these Buffles took the water, and fell a swimming in a square body; the little Boy stood upright upon the last, and stepping from one to another, drove them on with a stick, and that with as much force and assurance, as if he had been on dry Land, sometimes sitting down upon their Buttocks.”\textsuperscript{555}

\textsuperscript{554} The figure is inferred from Tavernier’s observation in March 1652 that water buffalo herders paid 1.25 piaster for each animal per year, and as a result the Grand Signor (then Mehmed IV) collected from the water buffalo tax more than 180,000 piasters annually. Jean-Baptiste Tavernier, \textit{Les Six Voyages de Jean Baptiste Tavernier} (Paris: G. Clouzier et C. Barbin, 1676), 1: 217.

\textsuperscript{555} Jean de Thévenot, \textit{The Travels of Monsieur de Thevenot into the Leavant}, trans. Archibald Lovell (London: Printed by H. Clark for H. Faithome, J. Adamson, C. Skegnes, and T. Newborough, 1687), 2:55. In 1758, Edward Ives made a similar observation of “a boy crossing [the river] on the backs of Buffaloes. He shifted himself from the back of one of these beasts, to another, with great dexterity, as often as he found it necessary for the order and better conducting of his herd.” “This extraordinary feat of activity,” Ives added, “put me in mind of that passage in the fifteenth book of Homer’s Iliad, where a man is represented as managing four horses at once, and leaping from the back of one to another at full speed.” Edward Ives, \textit{A Voyage from England to India, in the Year 1754, and an Historical Narrative of the Operations of the Squadron and Army in India, under the Command of Vice-Admiral Watson and Colonel Clive, in the Years 1755, 1756, 1757; including a Correspondence between the Admiral and the Nabob Serajah Dowlah} (London: Printed for Edward and Charles Dilly, 1773), 239.
Table 42. Water Buffalo Population in the Baghdad Province, c. 1580

<table>
<thead>
<tr>
<th>District</th>
<th>Region</th>
<th>Buffalo Tax (akçe)</th>
<th>Buffalo Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cemmasat</td>
<td>Scattered</td>
<td>420,942</td>
<td>19,134</td>
</tr>
<tr>
<td>Khalid</td>
<td>Rumahiyya</td>
<td>73,290</td>
<td>3,664</td>
</tr>
<tr>
<td>Kabsha</td>
<td>Rumahiyya</td>
<td>30,600</td>
<td>1,530</td>
</tr>
<tr>
<td>Malik</td>
<td>Rumahiyya</td>
<td>111,668</td>
<td>5,583</td>
</tr>
<tr>
<td>Zubayd Sharqi</td>
<td>Rumahiyya</td>
<td>8,800</td>
<td>440</td>
</tr>
<tr>
<td>Zubayd Gharbi</td>
<td>Rumahiyya</td>
<td>12,380</td>
<td>619</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td><strong>657,680</strong></td>
<td><strong>30,971</strong></td>
</tr>
</tbody>
</table>

Notes: the figures are conservative estimates based on total revenues projected to be collected on the water buffalo divided by the annual tax rates given in the law code of each district. When the law codes of several districts in Basra do not state the actual tax rate, I used 27 akçe based on the highest rate in the province as a conservative measure to avoid overstatement.

Source: see Appendix A

Table 43. Water Buffalo Population in the Basra Province, c. 1590

<table>
<thead>
<tr>
<th>District</th>
<th>Buffalo Tax (akçe)</th>
<th>Buffalo Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gharraf</td>
<td>12,000</td>
<td>923</td>
</tr>
<tr>
<td>Kil ve Kinbad</td>
<td>1,950</td>
<td>72</td>
</tr>
<tr>
<td>Qannasiyya</td>
<td>16,185</td>
<td>599</td>
</tr>
<tr>
<td>Akçe Kale</td>
<td>12,500</td>
<td>481</td>
</tr>
<tr>
<td>Midan</td>
<td>106,795</td>
<td>3,955</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>149,430</strong></td>
<td><strong>6,031</strong></td>
</tr>
</tbody>
</table>

Source: see Appendix A

The water buffalo were privileged ruminants, free to move without pens, cages, or leashes and hand-fed by their owners. Marsh waters protected them from the region’s harsh climate and offered ample supplies of fodder, in the form of hydrophytes (aquatic vegetation) regularly submerged for long periods—grasses (*Panicum repens* and *Paspalum distichum*), sedges (*Scirpus brachyceras*), bulrushes (*Typha augustata*), and young and succulent shoots of the giant reed (*Phragmites communis*), the latter providing the bulk of the buffalo feed. Herding families foraged on their animals’ behalf on a daily basis to secure a great deal, in some seasons all, of the required fodder. The daily search for pasture began soon after dawn with the buffalo’s departure from their dwelling islands alone or with children, wading through the waterways toward the nearest patches...
of land. At about the same time, herding families set out in canoes, leaving behind their houses
guarded by a watchdog, and spent the day cutting reeds and grass. Both parties of foragers, the
buffalo herds and laden canoes, returned to their island houses late in the afternoon, where the
daily fodder harvest was spread for the buffalo to consume at night. In the winter and spring, when
the water is high and the weather is cold, the buffalo remained confined to its dry platform
throughout the day, groaning and rasping until its owners returned and laid before it a full day’s
grazing. When fodder became scarce, families resorted to stalks of rice and millet stored during
the cultivation season and used them as buffalo feed. Grazing could be beneficial not only to
the water buffalo but also to the marsh ecosystem as well. Without grazing, a wetland could suffer
from eutrophication and overgrowth, as documented in a wetland site in Kristianstad (south of
Sweden) in the late twentieth century, when conservation efforts halted grazing in the region.

Marsh dwellers used fire to further sculpt their landscape and make it more favorable to
buffalo grazing. They burned swamp areas to remove large, coarse, and dead vegetation and
stimulate young growth more palatable to herbivores than the older material. The practice
normally took place at the end of the year, so the young shoots could sprout during their natural

556 D. C. P. Thalen, Ecology and Utilization of Desert Shrub Rangelands in Iraq (The Hague: Dr.
W. Junk, 1979), 22-23; Harry Wayne Springfield, Forage Problems and Resources of Iraq
(Washington, D.C.: International Cooperation Administration, 1957), 7; Salim, Marsh Dwellers
of the Euphrates Delta, 91-92; Maxwell, 65-67; Young, 167-170.
557 Per Olsson, Carl Folke, and Thomas Hahn, “Social-Ecological Transformation for Ecosystem
Management: The Development of Adaptive Co-Management of a Wetland Landscape in
558 Springfield, Forage Problems and Resources of Iraq, 7. Grazers’ use of fire was common in a
number of African swamps as well. See Clive Howard-Williams and John J. Gaudet, “The
Wetland Vegetation: A Botanical Account of African Swamps and Shallow Waterbodies, ed.
Patrick Denny (Dordrecht: Dr. W. Junk, 1985), 166.
growth cycle, beginning in January and continuing until June.\textsuperscript{559} In late December 1834, the Scottish artist J. Baillie Fraser witnessed the practice firsthand: “we came at once upon a large hore [marshland] in a blaze, the grass presenting a burning line of vivid flame of more than three miles long.” “The Arabs,” he later explained, “have a custom of burning the dry grass of the marshes that a new and sweet growth may come up for their cattle in the proper season; and thus we had the magnificent spectacle of a whole country in flames.”\textsuperscript{560}

The water buffalo were prized, first and foremost, for their dung, a substance with several critical uses. Men relegated the task of processing it, along with the processing of grain, to females in the house. Girls in pre-school years followed the water buffalo to collect manure and brought it back home. Women in the family shaped it into thin pats like rounds of unleavened bread and left them to dry before stacking them to be used as fuel to keep warm, cook, and ward off biting flies. In addition, due to its consistency and ability to dry hard like cement, buffalo dung was the primary mortaring material in the marshes, used in the building of houses and granaries, among other structures. Buffalo dung had medicinal uses as well, applied to the forehead for headaches and to cuts, wounds, and burns as a healing agent.\textsuperscript{561}

Milk was the buffalo product second in importance for marsh dwellers. In the middle of the seventeenth century, Tavernier estimated that the Iraqi female buffalo, presumably when in full lactation, could yield as much as twenty-two pints of milk daily.\textsuperscript{562} Men were in charge of milking the buffalo, the same way milking a camel was the responsibility of men among the Arab

\textsuperscript{560} Fraser, \textit{Travels in Koordestan}, 2:42-43.
\textsuperscript{561} Ochsenschlager, \textit{Iraq’s Marsh Arabs in the Garden of Eden}, 194; Maxwell, \textit{A Reed Shaken by the Wind}, 63-64; Young, \textit{Return to the Marshes}, 41-42; Salim, \textit{Marsh Dwellers of the Euphrates Delta}, 93.
\textsuperscript{562} Tavernier, \textit{Les Six Voyages de Jean-Baptiste Tavernier}, 1:217.
desert tribes. Locals consumed milk daily, fresh or sour. Using simple methods (whipping with a wooden spoon, churning by suspended animal skin, shaking in a hollowed-out gourd, heating over fire), the original milk could be processed and converted into a variety of more durable and palatable dairy products, including curds, cream, cheese, and butter. Buffalo milk is very similar to cow milk in its chemical composition and physical properties and provides excellent supplements of protein, vitamins, mineral salts, and calories to human diet.⁵⁶³

Dung and milk only partly explain why locals allowed water buffalo to live long and privileged lives in the marshes. Another factor had to do with the unsavory taste of their meat, tough and stringy. Slaughtering the animal did not make sense unless its milk-production and work capacity were in decline due to age, it was suffering from an injury past saving, or a period of famine and food shortage threatened human survival. In these unusual circumstances, a family would kill its buffalo to secure its meat and the price of its hide and to reduce the pressure on fodder for healthier animals. Buffalo that avoided these misfortunes usually lived about twenty years, over thirty if lovingly tended.⁵⁶⁴

In the Tigris-Euphrates marshes, the water buffalo lived on the edge of what was possible in terms of temperature. The frigid winters of northern regions could have deleterious effects, leading sometimes to mass mortality among buffalo populations. Most buffalo in Anatolia between Samsun and Tokat, for instance, perished in December 1743 due to freezing temperatures.⁵⁶⁵ In the south, the bovine faced the opposite challenge and struggled to regulate its body temperature

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⁵⁶⁵ BOA, MAD 9947 (4 ZA 1156/20 December 1743).
in the searing heat of Iraq’s summers. Its dark skin absorbs heat; its thick skin reduces its ability to get rid of surplus heat. Compounding the stress is the fact that the buffalo is a milch animal. It will feed as long as it needs to produce the milk output sought after by its calves and owners, a cycle that fuels its metabolic heat production. A major physiological mechanism some mammals use to cool themselves is sweating. The water buffalo, however, has a small number of sweat glands per unit area, a handicap it shares with the hippo. Herders found a solution to this thermal conundrum in the natural wallows of the marshes, the center of the buffalo’s world and most effective means to shelter it from exposure to solar radiation. A leisurely life in this aquatic environment allowed the water buffalo to triumph and become one of nature’s giants in Iraq.566

**Conclusion**

The marshes may have been no healthier than the rest of the Tigris-Euphrates alluvium, but offered the great advantage of reliable subsistence. Their needs for food, housing, transport, and fuel fulfilled, marsh settlers were largely self-sufficient and did not have to step outside their sheltered world behind in search for resources. Their autarky and isolation gave rise to a flurry of stereotypes in urban areas that mocked them as the “dregs of the human species,” uncouth and unsophisticated like their buffalo, “scarcely exceed[ing] them in intellectual endowments.”567 Stories of ignorant marsh men visiting Basra City and their awkward encounters with a refined urban population were common objects of satire.568 However, marsh settlers were far from a people left behind by history. Life in the marshes, in many respects, was a dynamic response to the fluid environmental

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conditions of the Tigris-Euphrates alluvium. In addition, as Chapter 7 will demonstrate, wetland settlement on numerous occasions was a highly political decision that aimed at subverting the appropriation attempts of greedy agents of the state. In the marshes, households found a place where they could meet their daily needs for subsistence and remain completely out of contact with their neighbors and beyond the reach of a predatory government.
PART III: AVULSIONS

The Ottoman Empire’s investment portfolio in the Water Wide Web, diversified among different biomes, paid off. It generated substantial financial gains with minimal inputs of imperial labor and capital. Plus, social arrangements made with tax farmers, herders’ associations, and other rural groups expanded Ottoman authority from cities and towns into the countryside.\textsuperscript{569}

The rewards, however, were commensurate with ecological and political risks. Ecologically, the most prominent risks stemmed from perennial irrigation, which, unlike mobile pastoralism and wetland exploitation, by design violated the sovereign rhythms of the river system. By altering the natural flow regime using artificial canals, it intensified the inundation of the alluvium under millions of tons of silt and salt and imposed perpetual costs to clear canals, leach soils, and ensure that agriculture remained viable. Imperial officials and the local inhabitants contained siltation and reduced salinization by relying more heavily on shorter canals and by farming in crop-fallow rotation, but they never eliminated both problems. A far more serious instability caused by river diversions was that of channel shifts; I will come back to it shortly.

Beyond arable lands, Ottoman toleration and even promotion of mobile pastoralism and wetland habitation exposed the empire to high political risks. Istanbul could profit from its alliance with pastoral groups so long as political conditions remained stable. When the provincial administration plunged into turmoil, the ties of grasslands and wetlands to imperial nodes of power were among the first to unravel. The freedom to thin out the grass, in other words, allowed sheep

and buffalo herders to level the playing field with their urban neighbors when opportunity knocked at their door.

That moment arrived in the late seventeenth century, when the latent ecological and political hazards associated with Ottoman land management turned into a full-blown catastrophe. A deadly cocktail of natural and political events would destabilize the Euphrates River’s channel and foment rural rebellion in the Iraqi countryside. The following two chapters trace in greater detail the complicated dynamics behind this watershed in the history of the Tigris-Euphrates alluvium and how it transformed the Ottoman presence in the region during the eighteenth century.
Chapter 6: The Fall of Rumahiyya

“The majestic stream of the Euphrates wandering in solitude, like a pilgrim monarch through the silent ruins of his devastated kingdom, still appeared a noble river, even under the disadvantages of its desert-tracked course. Its banks were hoary with reeds, and the grey osier willows were yet there, on which the captives of Israel hung up their harps, and while Jerusalem was not, refused to be comforted. But how is the rest of the scene changed since then!”

~ Sir Robert Ker Porter, Travels in Georgia, Persia, Armenia, Ancient Babylonia, & c. & c. during the Years 1817, 1818, 1819, and 1820 (London: Longman, Hurst, Rees, Orme, and Brown, 1822), 2:297.

The Euphrates River mobilizes water and sediment into a dynamic and complex flow powered by the energy of the sun and gravity of the earth. It delicately changes over space and through time and adjusts to prevailing environmental conditions. Spatially, runoff and sediment production predominate in the headwater regions of the Taurus Mountains before the river turns into a sediment sink and loses much of its water through dissipation and evaporation in the Iraqi alluvium. Temporally, the river displays markedly different identities in the summer and spring, with contrasting discharge rates and water-surface elevations.

Between 1687 and 1702, these timeless, ever-recurring regional and seasonal changes were eclipsed by intense ecological disturbances that transformed the Euphrates’ hydraulic architecture. A dramatic rupture in the river’s flow occurred when a large segment of it, approximately a hundred miles in length, escaped its established channel and gushed into a new one. The abrupt relocation of the river, a process called avulsion by geologists and hydrologists, profoundly altered the ecology and politics of Iraq and imperiled the stability of the Ottoman Empire in the east, threatening traditional centers of power and permitting otherwise lesser tribes to enjoy temporary
ascendance. Thousands of lives were lost during the intervening years, and numerous settlements were abandoned and left to ruin.

This chapter documents the metamorphosis of the Euphrates River in the late seventeenth century. Beginning in 1687, a prolonged meteorological anomaly and an ill-fated irrigation project divided the Middle Euphrates in Iraq into two capricious branches (Figure 35). For a constellation of reasons, the Ottoman central and provincial administrations were incapable of resolving the environmental crisis until the river had completely abandoned its original bed in 1700. The channel pattern that emerged thereafter withstood the assault of an engineering expedition tasked with undoing the avulsion in 1701-1702, thus facilitating the fall of the Ottoman Rumahiyya fort southwest of Baghdad.

Figure 35. The Euphrates River's Avulsion, 1687-1702

Credit: Faisal Husain, 2018.
The environmental regime shift under analysis appears in the most comprehensive histories of Ottoman Iraq as a sudden, arbitrary rupture that took place in 1700, unconnected with any preceding crisis that had engulfed the region.\textsuperscript{570} That dating is based on chronicles that recorded only the climax of a long-term process. The discussion herein, which combines tree-ring analysis (dendrochronology) with untapped archival sources, argues that the Euphrates started to reposition its course at an earlier date, in part because of an exceptionally dry period in central Anatolia in 1687 and 1688. This earlier dating has major historiographical implications. It uncovers distinct causes that lay behind the river’s tumultuous reconfiguration and connects the calamitous events that afflicted Iraq between 1687 and 1702, once thought to be random, into a coherent whole. As one scientist remarked, “Flowing water is not simply an unstructured chaos but contains persistent forms that can be recognized, recorded, analyzed—forms, moreover, that are of great beauty, of value to the artist as well as the scientist,” not to mention the historian.\textsuperscript{571}

The study of morphological change in the Tigris and Euphrates has been largely the domain of archaeologists and earth scientists.\textsuperscript{572} Given that a significant portion of the literature is


theoretical, this article aims to bring an empirical, holistic approach to the study of avulsion, concerned not only with causal factors but also with society’s response and adaptation to it. Archaeologists and scientists have deftly outlined the skeleton of avulsion in Mesopotamia, to which historians can add the sorely needed flesh and blood. The eyewitness accounts utilized herein offer a unique opportunity to move the analysis of channel evolution from the inanimate, all-seeing GIS map to the living experience of anxious urban scribes, weary construction workers, and valiant tribal sheikhs situated in the middle of the changing alluvial environment.

**Drought**

The dread of famine gripped Baghdad on Tuesday, December 7, 1688. Starving families from Mosul and the Kurdish regions flocked to the city begging for aid. Epidemics infected the refugee population, many of which failed to find shelter in the increasingly overcrowded provincial capital despite the best efforts of its notables. Rumors and panic gave way to anarchy. A group of janissary soldiers approached and murdered an attendant at the shrine of Abu Hanifa (d. 767) for allegedly engaging in a monopoly that aggravated currency inflation. The prices of wheat, barley, meat, dates, and raisins skyrocketed in a year remembered by the people of Mosul as that of the Great Inflation.⁵⁷³

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Famine, displacement, and inflated prices came in the wake of a dwindling flow in the Tigris and Euphrates. Change in the rivers’ water levels occurred during a sharply defined and distinctive weather anomaly, registered in the rings of Anatolian trees and the pages of Ottoman state records and chronicles. As Silahdar Fındıklılı Mehmet Ağa (d. c. 1726) wrote, protracted wars and drought in the “Muslim lands” resulted in a great famine and inflation that became extremely intense after 1687.\textsuperscript{574} Reports penned by Ottoman judges and officials in Diyarbakır and Akşehir, and as far west in Anatolia as Eskişehir and Seferihisar, conveyed to Istanbul the subjects’ tribulations.\textsuperscript{575} A dendroclimatic study corroborates Silahdar’s account and the official reports, revealing that Sivas near the catchment area for the twin rivers had experienced drought in 1687 and 1688.\textsuperscript{576} The anomalous precipitation was a signal of the climatic regime of the Late Maunder Minimum (1675-1715), a period characterized by considerably low sunspot numbers, colder temperatures, and highly variable climatic conditions with a tendency toward extremes, especially in the continents of the Northern Hemisphere.\textsuperscript{577} As precipitation declined in Anatolia, drought


\textsuperscript{575} For Diyarbakır, BOA, MAD 3871, p. 63 (22 ZA 1690/27 August 1690); BOA, D.BŞM.DBH 14/54 (22 § 1104/28 April 1693); for Akşehir, BOA, AE.SAMD.II 2/115 (10 § 1104/16 April 1693); for Eskişehir, BOA, İE.SH 1/76 (18 C 1102/19 March 1691); for Seferihisar, BOA, İE.DH 9/880 (Evâst C 1102/12-21 March 1691).


struck in Crimea, central Russia, and India; sea ice accumulated on the coast of Iceland; and hailstorms and gales smashed fields and vineyards in Switzerland. Firm connections between these extreme weather events are elusive, but they conformed to the prevailing, unstable climatic norm.578

Baghdadi chroniclers establish the necessary correlation between the Sivas precipitation reconstruction and the Tigris-Euphrates flow in 1687-1688. In the words of Baghdad’s chancellor Murtaza Nazmizade, “By the wisdom of the One who cannot be called to account for anything He does, dread and fear of inflation overcame the hearts of people when the dearth of quenching rainfall brought the Tigris and Euphrates to a halt.”579 Ahmad Ghurabzade (d. 1691) added that the rivers flooded their banks.580 These terse yet invaluable observations are crucial to comprehend the events that unfolded in the following months. Nazmizade’s remark that the rivers came to a halt alludes to a crippling effect on their status as agents of transport. Rainfall shortage diminished stream power, the means by which rivers overcome friction, transport sediment, and perform the

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basic geomorphic work that creates their channels. A feebler stream intensified sediment accumulation within the channels, raised the riverbeds, and prompted a spillover, as Ghurabzade noted.\footnote{For the relationship between stream power and sedimentation in the Mesopotamian context, see T. J. Wilkinson and Carrie Hritz, “Physical Geography, Environmental Change and the Role of Water,” in \textit{Models of Mesopotamian Landscapes: How Small-Scale Processes Contributed to the Growth of Early Civilizations}, ed. T. J. Wilkinson, McGuire Gibson, and Magnus Widell (Oxford: Archaeopress, 2013), 20.}

The Euphrates, which is more typical of the hydraulically vulnerable rivers of the arid zone than is the Tigris, was at a greater risk under drought conditions. No significant tributaries join it between the Khabur River in Syria and Shatt al-Arab, a distance of some 750 miles. The feather-like catchment basin of the Tigris, in contrast, receives tributary contributions, draining the Zagros Mountains from its eastern bank along most of its course, notably from the Greater Zab, Lesser Zab, and Diyala. Furthermore, the Euphrates’ gentler slope makes it more sluggish than the Tigris, which has carved a deeper bed at a significantly lower altitude. The Euphrates is also longer than the Tigris; in fact, it is the longest river in western Asia. The mountain basin near Erzurum from which it debouches is more distant from lower Iraq than is the source of the Tigris. Mount Karaca, a shield volcano in southeast Anatolia that rises to 6,300 feet, deflects the Euphrates westward and further extends its length, forcing it to traverse several hundred miles through the parching heat of the Syrian Desert. Therefore, whereas the Tigris, like the majority of river systems in humid environments, receives a push from tributaries that preserve the vigor of its flow through most of its course, the Euphrates, longer in channel, gentler in gradient, and without hydrologic support in Iraq, enters the alluvial plain a much weaker river. Through seepage, evaporation, and irrigation, it suffers a considerable diminution in volume, velocity, and power downstream—vulnerable to
the resistance of the channel bed sediments to its movement—and loses definition in southern Iraq as the ratio of sediment to flow surges.\footnote{Andrew S. Goudie, \textit{Arid and Semi-arid Geomorphology} (New York: Cambridge University Press, 2013), 204-245; M. G. Ionides, \textit{The Régime of the Rivers, Euphrates and Tigris} (London: E. & F. N. Spon, 1937).}

As a result, precipitation decline in 1687-1688 disproportionately affected the Euphrates, weakened its already feeble stream, and aggravated its vulnerability to sedimentation and riverbed erosion. It also brought the river closer to what geologists term the threshold of critical power—the precarious point at which the power available for a stream to transport its sediment load equals the power needed to accomplish it.\footnote{William B. Bull, “Threshold of Critical Power in Streams,” \textit{Geological Society of America Bulletin} 90, no. 5 (1979): 453-464.} In other words, prolonged drought further destabilized an inherently unstable river downstream and increased the risk of clogging, overbank spillage, and channel migration. In such perilous situations, rivers can adjust and find a way to provide, under the new controlling variables, the velocity needed to transport the load supplied from upstream. In this case, help came unexpectedly from a man named Sheikh Dhiyab.

\textit{Sheikh Dhiyab}

Like foraging moose and dam-building beavers, humans perturb specific components of their environments, often inadvertently and with unintended consequences.\footnote{For the indirect consequences of moose herbivory and beaver engineering, see Robert J. Naiman, “Animal Influences on Ecosystem Dynamics,” \textit{BioScience} 38, no. 11 (1988): 750-762.} Around the turn of 1689, Sheikh Dhiyab attempted to direct irrigation waters down the levee slopes of the Euphrates north of Rumahiyya through a controlled levee break. Pressured by a hydraulically unbalanced stream since 1687, his project ultimately burst out of control and ushered in a new channel configuration.
Dhiyab was an ordinary sheikh engaged in an ordinary agrarian pursuit. Yet, the unintended consequence of his action earned him ill repute in Istanbul and eternal condemnation in the form of one sentence in the official history of the Ottoman Empire compiled at the time: “One of the Arab sheikhs issued and channeled water by creating a fissure in the [Euphrates] River in order to irrigate his gardens,” wrote Raşid Efendi (d. 1735), a court historian, before recounting the ramifications. The nameless sheikh’s fateful action sheds light on his predicament and that of other farmers in southern Iraq.

A number of environmental complications stood in the way of Sheikh Dhiyab’s basic aim to water his gardens. Canal excavation was essential due to the region’s meager annual rainfall, less than the 200-millimeters minimum required for dry farming. The low gradients of Iraq’s flat alluvial plain, which Evliya Çelebi likened to the Kipchak steppe in the Ukraine and Jean-Baptiste Tavernier (d. 1689) to the terrain in Holland, posed an intricate challenge to the canal excavator. Conducting water from the Euphrates required a channel that sloped at a steeper gradient than the landscape to avoid sedimentation but not so steep as to invite accelerated erosion. Sheikh Dhiyab was technically ill-equipped for the task and had to walk a tightrope between the extremes of sedimentation and erosion to solve this engineering dilemma.

Fortunately, the Euphrates lent a hand. After passing Ramadi, it flowed, as it does still, several feet above plain level in an elevated bed of its own making. Instead of cutting deeply, it transformed into a sediment-sorting machine, depositing coarser and heavier materials adjacent to

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585 Raşid Efendi, Tarih-i Raşid (Istanbul: Matbaa-i Amire, 1282/1865), 2:525. The published version of this work is listed in the Bibliography.
the banks and lighter ones into distant basins, the distance travelled for each sediment class being inversely related to grain size.\footnote{Michael Church, Tim P. Burt, Victor J. Galay, and G. Mathias Kondolf, “Rivers,” in \textit{Geomorphology and Global Environmental Change}, ed. Olav Slaymaker, Thomas Spencer, and Christine Embleton-Hamann (New York: Cambridge University Press, 2009), 98-129.}

The resultant river levees have historically bestowed local inhabitants with numerous advantages.\footnote{Piet Buringh, \textit{Soils and Soil Conditions in Iraq} (Baghdad: Ministry of Agriculture, 1960), 144-148.} The most compelling one, at least for Sheikh Dhiyab, was a lateral gradient steeper than the vexingly flat plain itself, along which he could direct irrigation waters down the levee slope toward his gardens. The Euphrates had endowed Sheikh Dhiyab with natural levees that he could break to lay the basis for a flexible and cost-effective irrigation module easily excavated, resistant to siltation, and manageable by the kin group to which he belonged.\footnote{T. J. Wilkinson, Louise Rayne, and Jaafar Jotheri, “Hydraulic Landscapes in Mesopotamia: The Role of Human Niche Construction,” \textit{Water History} 7, no. 4 (2015): 397-418.}

The scheme did not go as planned, however. All of their advantages notwithstanding, levee breaks, whether initiated by human or natural agency, represent points of weakness in the levee bank that could expand to the detriment of the river. The weak point provided by Sheikh Dhiyab became a node of avulsion, from which the Euphrates branched, producing an offshoot that joined the trunk channel (already under stress since 1687, due to diminished discharge) in conveying all of the water and sediment delivered to the river.\footnote{For nodes of avulsion, see T. J. Wilkinson, \textit{Archaeological Landscapes of the Near East} (Tucson: University of Arizona Press, 2003), 82-85.} Sheikh Dhiyab initiated the levee crevasse sometime after October 1688. By September 1689, Ottoman officials were reporting that it was growing at an exponential rate, flooding villages on its way and depriving those on the main course of sufficient water.\footnote{Nazmizade, “Gülşen-i Hulefa,” fol. 176a; BOA, D.BŞM.BGH 1/27, 1/29.} Thus, in this first, partial phase of avulsion, the Euphrates bifurcated below
Hilla into two low-energy, erratic branches—the parent channel and the Dhiyab Canal—before reuniting above ‘Arja. The onset of this new river regime brought an ecological quandary that strained the Ottoman provincial administration.

**Provincial Crises**

Under stable conditions and careful management, governments at the time could often turn a partial avulsion into an opportunity to expand irrigation networks, transportation routes, and settlement centers by maintaining sufficient and controlled flow in the parent and new channels. The Baghdad administration during the late seventeenth century, nevertheless, found itself entrapped in a vicious cycle difficult to break. Epidemiological, political, and financial crises impaired its ability to mount an effective response to the environmental shift, which amplified those crises.

The dwindling water supply of the Tigris and Euphrates after 1687 created a panic that propelled more and more people into Iraq’s urban centers, thereby maximizing the virulence of the plague when it hit the region. Raging in northern and western Persia as early as 1684, the plague surfaced in Baghdad in March 1690 to claim, according to Nazmizade, 100,000 lives. Several months later, it reached Basra, where it killed 500 daily, and hit Baghdad again in early 1691.\(^{592}\) The damage and loss of life in Baghdad were of apocalyptic proportions. “Friends and loved ones eschewed each other, the dues of fellowship were ignored, and everyone was preoccupied with his own life and careless about the conditions of others,” wrote Nazmizade. In his eyes, the scene was reminiscent of the Quran’s portrayal of doomsday: “The Day man flees from his own brother, his mother, his father, his wife, and his children” (80:35-37).\(^{593}\)


\(^{593}\) Nazmizade, “Gülşen-i Hulefa,” 155b-156a.
“Plague wields a power that is disproportionate to the deaths that it causes,” one scientist remarks. In late seventeenth-century Iraq, the high mortality it had caused in Baghdad and Basra compounded the damage that the Euphrates had done, creating an opening for mobile pastoral groups to prey on the afflicted urban populations. The extraordinary career of Sheikh Maniʿ, son of Maghamis and leader of the Muntafiq tribe, epitomized the rural-urban change in power dynamics. In 1691, he marched audaciously toward Basra with an armed force of 2,000 to 3,000 men. Standing in his way was an Ottoman contingent of no more than 500 men headed by Basra’s governor Ahmad Pasha. Terrified and outnumbered, 400 of the Ottoman troops deserted; the remaining 100 stood loyally with the pasha and died at his side on the battlefield. Another humiliating defeat in 1693 ended the mission of Baghdad’s governor to re-assert control over southern Iraq. The threat of Sheikh Maniʿ and other emboldened tribal leaders hung over Baghdad until the end of the seventeenth century.

After the Euphrates veered off course, plague broke out, and the countryside revolted, Baghdad plunged into a financial meltdown, its treasury “totally broken” (kulliyet ile maksur). The budgets of 1689 and 1690 sounded the alarm bells. Losses totaled 68,310 and 95,542 guruş, respectively, more than triple the budget surplus that the provincial treasury recorded in 1670. As

596 BOA, MD 104, no. 204, p. 50 (Evasit L 1103/26 June-5 July 1692).
late as 1702, officials at the Baghdad treasury were still dealing with a loss of 134,413 gurūṣ that they attributed to the damage made by the relocation of the Euphrates.\footnote{BOA, MD 105, no. 393, p. 93 (Evahir CA 1106/7-16 January 1695); BOA, D.BŞM.BGH 1/17, 1/27; BOA, D.BŞM.BGH 16735; BOA, MAD 9891, pp. 14-17 (1 RA 1114/26 July 1702); BOA, MAD 18540, p. 23 (10 L 1103/25 June 1692).}

The myriad forces of disease, politics, and finance conspired to sustain the perilous, segmented pattern of the Euphrates and allow it to evolve unmolested. Depopulation and financial distress handicapped the provincial administration’s ability to mobilize sufficient labor and resources to control the shifting riverbed, creating a political vacuum around Baghdad that rural forces exploited. What was initially an engineering complication (levee failure) gradually became a major military threat that called for an armed force large enough to defeat an emboldened rural enemy.

\textit{Imperial Crises}

The imperial council complained to Baghdad’s governor in late 1694, “From all sides, the cursed infidels are at present daringly assaulting the Muslim lands.”\footnote{BOA, MD 105, no. 394, pp. 94-95 (Evahir CA 1106/7-16 January 1695).} The Ottoman Empire, mired in an epic struggle against armies of the Holy League (1683-1699), suffered crushing defeats and enormous fiscal strains.\footnote{Caroline Finkel, \textit{Osman’s Dream: The Story of the Ottoman Empire, 1300-1923} (New York: Basic Books, 2007), 289-321; Virginia Aksan, \textit{Ottoman Wars, 1700-1870: An Empire Besieged} (New York: Routledge, 2007), 18-36.} The debilitating demands of an exacting and prolonged war severely hampered the attempts of Ottoman policymakers to devise a proper response to the Iraqi crisis. In late June 1692, the Imperial Council ordered Baghdad’s governor to dam the Dhiyab Canal and use state money (\textit{mal-i miri}) to reconsolidate the Euphrates. Experts in water control from the Rumahiyya region who had witnessed the development of the Dhiyab Canal appeared before the
governor in Baghdad to offer their assessment of the project’s feasibility and potential costs. The provincial administration concluded that as long as the Dhiyab Canal did not completely drain the main river, it could focus on other urgent goals requiring less time, effort, and resources. Hence, provincial officials ignored Istanbul’s order for the time being.\footnote{BOA, MD 104, no. 201, p. 49 (Evail L 1103/16-25 June 1692); BOA, MAD 18540, pp. 24-25 (10 L 1103/25 June 1692); Nazmizade, “Gülşen-i Hulefā,” fol. 176a.}

Willingly or otherwise, the Imperial Council followed suit and shelved any major hydraulic project, focusing instead on uprisings in the countryside. Two daring tribal leaders, Sheikh Mani’ in the south and Bebe Süleyman in Şehrizor to the north, had blatantly undermined what the authorities regarded as the very purpose of the Ottoman state—safeguarding the welfare of the subjects. Rural rebellion became even more urgent when it spiraled out of control around the Safavid border, threatening the peace with Persia established by the Zuhab Treaty in 1639. Ottoman decision makers unequivocally affirmed their interest in maintaining friendly relations with the Safavids and avoiding provocations, at least as long as the main Ottoman army was embroiled on the western front.\footnote{BOA, MD 104, no. 218, p. 53 (Evasıt L 1103/26 June-4 July 1692); BOA, MD 104, no. 225, p. 54 (Evasıt L 1103/26 June-4 July 1692); BOA, MD 104, nos. 473-474, p. 106 (Evasıt R 1103/31 December 1691-9 January 1692); BOA, MD 104, nos. 686-688, p. 161 (Evasıt C 1104/17-26 February 1693); BOA, MD 104, nos. 690-691, p. 162 (Evasıt C 1104/17-26 February 1693); BOA, MD 105, no. 395, p. 95 (Evahr CA 1106/9-18 November 1694); BOA, MD 111, nos. 532-537, pp. 161-162 (Evahl CA 1111/24 October-2 November 1699); BOA, MD 111, no. 1195, pp. 347-348 (Evail ZA 1110/1-10 May 1699); BOA, MD 111, no. 1196, p. 348 (Evasıt ZA 1110/11-20 May 1699).}

The embattled Imperial Council adopted various measures to contain the fallout caused by rural turmoil—among them, partial tax exemptions and resettlement plans for the disadvantaged, diplomatic exchanges with Safavid authorities, and constant admonishments to provincial officials to conduct themselves with clemency and justice toward the subjects. Its strategy regarding Bebe
Süleyman and Sheikh Mani oscillated between the politics of appeasement and outright warfare. Although both rebels had the blood of Ottoman officials on their hands, Istanbul sent Sheikh Mani a conciliatory letter (istimaletname) in 1693, granted him additional landholdings, and appointed Bebe Süleyman as bey of the Bebe Kurds around 1695. In more acrimonious moments, the Council called for Bebe Süleyman’s head and supported two half-hearted military expeditions against Sheikh Mani’ in 1695 and 1698, both of which ended in failure.\textsuperscript{602}

Thus, the imperial administration, like Baghdad, was trapped in a profoundly difficult situation during the late seventeenth century. Lacking the capacity to mend the disorderly flow of the Euphrates, it decided to give priority to immediate political action over long-term hydraulic management. As a result, from its inception, the Euphrates’ partial avulsion threatened to push the system toward another dire condition too costly to reverse. That grim prospect materialized by 1700, forcing Istanbul to change its political calculations.

\textit{Daltaban Mustafa Pasha}

In August 1701, an Ottoman equerry arrived in Baghdad carrying an imperial edict to governor Daltaban Mustafa Pasha, upon whom Sultan Mustafa II (r. 1695-1703) hung high hopes. Four months earlier, while performing the Friday prayer at the Selimiye Mosque in Edirne, Mustafa II received news that Daltaban Mustafa Pasha, described as “a vigorous and tyrannical Serbian,

\textsuperscript{602} BOA, MD 104, no. 235, p. 57 (Evahir L 1103/6-15 July 1692); BOA, MD 105, nos. 393-395, pp. 93-95 (Evahir CA 1106/7-16 January 1695); BOA, MD 106, no. 563, p. 161 (Evail ZA 1106/13-22 June 1695); BOA, MD 106, no. 575, pp. 165-166 (Evasit ZA 1106/23 June-2 July 1695); BOA, MD 106, no. 1281, p. 324 (Evail R 1107/8-17 November 1695); BOA, MD 111, no. 224, pp. 67-68 (Evahir S 1111/17-26 August 1699); BOA, MD 111, no. 1196, p. 348 (Evasit ZA 1111/1-10 May 1700); BOA, BOA, MAD 18540, p. 23 (10 L 1103/25 June 1692); Raşid Efendi, \textit{Tarih-i Raşid}, 2:225-26, 2:355-356; Nazmizade, “Gülşen-i Hulefa,” ff. 157a-159a; Defterdar, \textit{Zübdet}, 675.
illiterate but thrusting,” had just re-established Ottoman control in lower Iraq and re-conquered Qurna and Basra. Welcomed with attention and ceremony and dressed in sable fur, the emissary opened and read the imperial edict, praising the pasha’s loyal service and relaying to him his new task—to dam the Dhiyab Canal and restore the Euphrates to its former channel.

The long-awaited order arrived at a time when the map of the Ottoman world was being re-drawn. The signing of the Karlowitz Treaty in 1699 ended hostilities between the Ottoman Empire and the Holy League and diminished Ottoman influence in eastern and central Europe. In the east, Mustafa II and Shah Sultan Husayn of the Safavid Empire resolved border violations stemming from the activities of Bebe Süleyman and Sheikh Mani’ diplomatically, despite deep mistrust on both sides. More important than the geopolitical scene was the emergence of a new channel configuration in the Euphrates. Ottoman authorities had not kept track of intensified sedimentation occurring since 1687. By 1700, when war in the west was over and the trunk channel had become completely “filled and shut” (memlu ve munseed) and left dry and sandy, chroniclers in Istanbul and Baghdad were moved to issue grim accounts of the situation. The sight of sand hills (kum depeleri) standing in the middle of the derelict conduit later mesmerized even the Ottoman engineers. The Euphrates had entered its second, full avulsion phase, diverting its flow

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entirely to the Dhiyab Canal, which suddenly expanded and, in the words of Raṣid Efendi, “came to possess the strength and vigor of a large river.”

The central authorities could not tolerate this development. The new Euphrates played havoc with the agrarian and commercial sectors of the economy important to the Ottomans while rendering most of its ecosystem services to rural outcasts and rebels. Farmers had their fields either flooded and submerged or completely stripped of their water supplies, depending on their location; merchants had the movement of their vessels and caravans along the rivers interrupted. Meanwhile, mobile pastoralists, loathed by the administration for their alleged “natural disposition to depravity and wretchedness,” acquired an auspicious opportunity to seize power. The Euphrates’ new course refueled the process of wetland formation, creating new marshes and engorging old ones. Soon, the waterlogged, anaerobic sites turned into places of refuge and escape for rural groups to re-assert their autonomy and challenge state authority.

The ending of the long war in the west and the settlement of border disputes in the east finally permitted the rehabilitation of the Euphrates to become a top priority. The Ottoman emissary to Baghdad informed Daltaban Mustafa Pasha that Istanbul was prepared to offer all of the financial support and labor required to achieve the Herculean task. Rural uprisings made the initiative all the more urgent. Given a lull in major military engagements, confidence was high that the Empire could finally crush the despised pastoral enemies within its borders. “When the degree

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of ignorance displayed by the barefoot and naked wandering Arabs becomes evident,” a contemporary wrote, “nothing is easier than having their ears pulled.”

**An Engineering Feat**

The imperial administration brought into play what Sam White has termed an “imperial ecology,” tapping into vast reserves of natural resources and workers throughout the Empire to remake the Euphrates. The provisioning of wood, which took precedence, fell on the backs of the governors of Maraş and Malatya, where they cut 42,200 logs of different kinds and sizes and transported them via animals to various points along the Euphrates’ shores. The rafts that picked up the logs from each spot met at the Birecik shipyard in the upper Euphrates. Lighter wood, 12,000 palm and mulberry trees, came from Hilla in Iraq. The rough fibers surrounding the bases of palm fronds produced thousands of ropes and baskets. Aleppo’s tax collector was in charge of providing oakum, hawser, marline, and iron nails. When all of the resources collected from Maraş, Malatya, and Aleppo assembled in the Birecik shipyard—together with cauldrons for cooking pitch, carpentry tools, forges, spades, pickaxes, sacks, bags, cannons, explosive bombs, and mallets—Ottoman authorities loaded the supplies into open-topped boats and shipped them downstream to Iraq.

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613 BOA, MAD 966, pp. 192-215 (20 M 1113-17 M 1114/27 June 1701-13 June 1702); BOA, MAD 3595, p. 6 (13 L 1113/12 March 1702); BOA, MAD 3595, p. 24 (24 L 1113/23 March 1702); BOA, MAD 3959, pp. 72-73 (28 ZA 1113/26 April 1702); BOA, MAD 3959, pp. 73-74 (1 Z 1113/29 April 1702); BOA, MAD 3959, pp. 101-102 (25 Z 1113/23 May 1702); BOA, MD
The manpower assembled under the command of Baghdad’s governor was no less impressive. Steersmen, rowers, caulkers, and blacksmiths from the areas around Birecik descended upon Iraq via the Euphrates with cargo. Infantrymen escorted the boats as they traveled. Governors and pashas of the eastern provinces and districts of Kütahya, Diyarbakır, Shahrizor, Mosul, and Köy Sancak joined their forces with Baghdad’s janissaries. From Istanbul came the deputy commander of the janissaries (kul kethüdası) with a regiment, gunners, and armorers. Artisans, including workers in brass and carpenters, and a military band took part in the campaign. After four months of travel, preparation, and ceremony, this motley crew departed from its meeting point in Baghdad in early December 1701 and crossed to the western Euphrates bank through Hilla, where it unloaded provisions from the boats.614

After violently crushing a rebel force, the expedition was ready to embark on the grand project, which it sought to accomplish in two major steps—(1) dredging and re-digging the sediment-choked channel and (2) damming and closing the Dhiyab Canal that had absorbed all the flow by 1700. As soldiers and workers pitched their tents, Daltaban Mustafa Pasha surveyed the defunct channel with the high-ranking officers, blacksmiths, and carpenters. The plan was to dig a channel approximately 2.5 miles long, 300 feet wide, and 50 feet deep. The followers of each military leader, as well as locals from Hilla, Hasaka, Karbala, and Najaf, had specific areas to dig. The project began on December 22, 1701.615

The imperial administration had drafted traders and craftsmen to accompany the expedition and supply it with provisions. Bakers, grocers, vegetable sellers, butchers, drapers, and silk manufacturers established a marketplace in the campsite and attracted customers with “beautiful melodies.” The authorities neglected neither hygiene nor morale; they established several baths and coffee shops and recruited confectioners and perfume makers. Ships carrying food from Baghdad, Hasaka, and Hilla on a daily basis sustained the camp. “As famously said,” a chronicler wrote, “even bird milk was found.” Known by other historians as the military market (ordu pazarı), this organizational method for supporting large campaigns, according to Suraiya Faroqhi, perfectly suited the circumstances that the Ottoman Empire had faced since the late sixteenth century—an increasing hostile political environment, financial crises, and ecological pressures.

About 4,000 workers were employed on the project, carrying soil on their backs in sacks and bags. Transported earth formed hills on the sides of the river. A military band played with gusto to lift everyone’s spirits. In the afternoon of February 7, 1702, after about forty-eight days of digging, water started to burst into the channel under reconstruction. After consultations, leaders concluded, “Good is in what God has chosen,” and removed the barrier between the Euphrates and the channel to allow the river to run its new course. In celebration of their accomplishment, officers and workers read Quranic chapters, made sacrificial offerings, and raised their hands in prayer. Meanwhile, 200 naked men braved the gushing waters with rafts to continue clearing the new

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channel. More than 20,000 people on both sides watched the spectacle with awe, crying, “God is great! There is no god but God!”

Following the reclamation of the old riverbed, blacksmiths, carpenters, and weavers, with the assistance of twelve ships from the imperial fleet and a few thousand oxen, focused their efforts on damming the Dhiyab Canal to complete the diversion. Nature, however, refused to cooperate. The Euphrates became unruly in spring, the season when melting snow brings high floods in the river, and swallowed the thousands of soil-filled mats and baskets that workers had rolled into the water to establish the damming structure. In late March, the river inundated the Ottoman camp and carried away remaining timbers. Due to timber shortage, rising water levels, and the campsite’s putrefaction, workers decided to abandon the project on March 30, 1702. After appointing guards to oversee the partially built dam, they met with Daltaban Mustafa Pasha to compose a letter to their superiors in Istanbul describing their ordeal and justifying their decision, and dispatched the remaining provisions back to Baghdad.

**Rumahiyya**

Within a twenty-five-year period, feedback loops between natural and anthropogenic forces gave violent birth to a new hydraulic order in Iraq’s Middle Euphrates region that produced long-term winners and losers. The obliteration of the Rumahiyya fort was a major case in point. The fort emerged during the Ilkhanid period in Iraq (1258-1336) as a riverine transit hub and apparently a

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center for spear production. Under Ottoman rule in the sixteenth century, it bustled with a dyeing workshop, a slaughterhouse, a market, a press (for making juice or oil), a spinning mill, a tannery, and even a gaming house (qumar hane). The town’s governor sometimes ran Baghdad’s affairs when its governor left on a military campaign. Tax-collection figures indicate that the town received a major boost after the Ottoman conquest of Baghdad in 1534, flourishing throughout the sixteenth and seventeenth centuries despite periodic Ottoman-Safavid confrontations in Iraq (Table 44).

Table 44. Tax Projections for the Rumahiyya Fort

<table>
<thead>
<tr>
<th>Year</th>
<th>1538</th>
<th>1544</th>
<th>1577</th>
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<tr>
<td>Amount</td>
<td>74,386.5 akçe</td>
<td>257,412 akçe</td>
<td>242,520 akçe</td>
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</table>

Sources: see Appendix A

When compared with other market towns in the Baghdad province c. 1577, Rumahiyya appears to have been nothing special in terms of wealth and population (Table 45). However, its significance extended beyond its fortified walls. As the medieval Jerusalemite geographer Muhammad al-Maqdisi (d. c. 1000) sagely observed, “You should know that an area does not become sublime by the number of its towns, but rather by the splendor of its rural villages. Do you not see the splendor of Nishapur and Bukhara despite the dearth of their towns?” In its rural villages, Rumahiyya was the most profitable farming region in Baghdad, densely populated, cultivated, and grazed. The Rumahiyya fort functioned as the Ottoman administrative center for the far more prosperous rural settlements and tribal groups in its vicinity, organized in five

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621 TKG.KK, TT 29, ff. 313b-314a.
districts—Khalid, Kabsha, Malik, Zubaid Gharbi, and Zubaid Sharqi. In total, they contributed more taxes than any other farming region in Baghdad, followed by the plains adjoining the lower Diyala River, one of the primary tributaries of the Tigris (see Table 46). The chief granary of several bygone empires, the core farming region of the Diyala River in the sixteenth century consisted of the districts of Halis, Mahrud, Tariq-i Khurasan, and Shahrab, located roughly between Derne and Baghdad in Figure 35.

Table 45. Major Market Towns in the Baghdad Province, c. 1580

<table>
<thead>
<tr>
<th>Town</th>
<th>Tax Collected (akçe)</th>
<th>Town</th>
<th>Taxable Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baghdad</td>
<td>4,522,125</td>
<td>Baghdad</td>
<td>3,309</td>
</tr>
<tr>
<td>Mandalijin</td>
<td>511,463</td>
<td>Hilla</td>
<td>1,498</td>
</tr>
<tr>
<td>Bilad Ruzin</td>
<td>452,132</td>
<td>Mandalijin</td>
<td>1,335</td>
</tr>
<tr>
<td>Shahrab</td>
<td>442,902</td>
<td>Rumahiyya</td>
<td>890</td>
</tr>
<tr>
<td>Hilla</td>
<td>361,121</td>
<td>Shahrab</td>
<td>405</td>
</tr>
<tr>
<td>Rumahiyya</td>
<td>251,520</td>
<td>Bilad Ruzin</td>
<td>364</td>
</tr>
</tbody>
</table>

Source: see Appendix A

Table 46. Rumahiyya and Diyala Regions Compared, c. 1580

<table>
<thead>
<tr>
<th>Farming Region</th>
<th>Rumahiyya</th>
<th>Diyala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax collected (akçe)</td>
<td>4,879,668</td>
<td>4,426,948</td>
</tr>
<tr>
<td>Taxable human population</td>
<td>12,135 (71% pastoralists)</td>
<td>4,492 (100% mixed farmers)</td>
</tr>
<tr>
<td>Caprid population</td>
<td>76,023 (sheep only)</td>
<td>24,176 (sheep and goats)</td>
</tr>
<tr>
<td>Water buffalo population</td>
<td>11,837</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Percentage figures have been rounded; all figures are approximate.
Source: see Appendix A

The Rumahiyya sub-province, where ancient Borsippa and its hinterland once stood, was an ecological patchwork, an ecotone between arable lands and marshlands interspersed with semi-
arid steppe and ephemeral channels. The environmental conditions favored extensive over intensive systems of land use, evident in the poor yields in return for inputs of labor compared with the situation in Diyala, a more homogenous landscape with better productivity and more reliable irrigation agriculture. Highly vulnerable to a seasonal flow out of phase with the agricultural cycle and to periodic uncontrolled runoff under poor drainage conditions, most land tracts were more amenable to stockbreeding than crop cultivation. The complex mosaic of weeds, stubble, artificial canals, freshwater marshes, and seasonally filled depressions created by the Euphrates provided extensive pasturage for a considerable sheep population, three times bigger than Diyala’s, and offered natural wallows for water buffalo (Table 46).

Animal rearing was an efficient way to convert Rumahiyya’s inedible and nontaxable coarse grasses, bulrush, reed shoots, and other lacustrine vegetation into appetizing and taxable types of food and raw material. The water buffalo in particular is renowned for its capacity to digest low-quality roughage material otherwise not useful as livestock feed for protein synthesis and milk production. Herders found uniquely hospitable conditions for buffalo husbandry in Rumahiyya’s fragmented landscape (Table 46). In return, Ottoman officials imposed a lucrative annual tax of twenty akçe on every buffalo in Rumahiyya, compared to one akçe on sheep and two akçe on the sale of buffalo hides used in various types of heavy leather manufacture. The sale of sheep garnered a tax of two akçe.

Nevertheless, a region given to stockbreeding and semi-sedentary folk was fraught with environmental and political risks. Although a successful environmental adaptation and a

626 TKG.KK, TT 29, fol. 304b.
contribution to biodiversity, managed mammal herbivory in Rumahiyya came at the expense of a
text of productivity and significantly lower yields in cereal crops. The farmers of Diyala at the
northern end of the alluvium—where arable production, the highest in value per unit weight, ruled
superme—were able to avoid such drawbacks. More important, allowing or even encouraging
mobile pastoral groups to occupy and pasture their flocks in Rumahiyya to maximize the land’s
tax revenues bestowed political advantages to herders in their highly contingent relationship with
the ruling power. With their wealth on the hoof, they were “both inclined and able to resist or
evade centralized government,” particularly during times of political instability, when the chain of
command inscribed in Ottoman cadasters and law codes eroded.627 The following poem finely
captures pastoralists’ penchant for independence and autarky: “Do not cultivate the vineyard;
you’ll be bound / Do not cultivate grains; you’ll be ground / Pull the camel, herd the sheep / A day
will come, you’ll be crowned.”628

An auspicious opportunity for Rumahiyya’s pastoralists to crown a chief of their own came
in 1700 when the original Euphrates branch fell into disuse and deprived the fort of its water
supply. After the Baghdad administration suffered rapid financial losses in the Rumahiyya fort,
tribal forces assumed control of the town in 1694.629 Following the complete abandonment of the

629 Al-ʿAzzawi, Tarikh al-Iraq, 5:160. Only the printed version of Nazmizade’s chronicle
mentions the fall of Rumahiyya in 1694. See Nazmizade, Gülşen-i Hulefa (Istanbul: Darü’-
Euphrates trunk channel, Ottoman ledgers in 1702-1703 record for Rumahiyya, and its districts of Malik, Khalid, and Kabsha, an outstanding debt of 37,782 guruş, roughly double the budget surplus the Baghdad treasury recorded in 1670. From 1704 onward, the fort dropped from the ledgers all together. 630 In 1765, a passerby noted the town’s dwindling population then paid tribute to the Khaza’il tribe. 631 The town’s decline became irreversible before the end of the eighteenth century, when the French consul in Baghdad described it as an “ancient city” that had “fallen into ruins.” 632 By the nineteenth century, Rumahiyya had largely disappeared from the historical record.

**Conclusion**

The “fatal synergy between natural and human disasters,” as Geoffrey Parker puts it, in late seventeenth-century Iraq is comparable to the Ottoman crisis in Anatolia nearly a century earlier, when the similar elements of drought, inflation, plague, rural rebellion, and military entanglement with the Habsburgs happened to coincide during the 1590s. 633 Nonetheless, the interaction between natural and human systems in Iraq was unique for the prominence of fluvial processes, which exerted enormous power in shaping and defining events from 1687 to 1702. Dwindling flow in the Tigris and Euphrates created an atmosphere of crisis that crept over Baghdad and Basra, amplifying the impact of plague in the region. Change in the climatic, hydraulic, and sedimentary variables governing flow in the Euphrates triggered avulsion, abetting the military success of rural

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630 BOA, D.BŞM.BGH 1/17, 1/27, 1/29, 1/56, 1/59; BOA, D.BŞM.BGH 16735.
633 Parker, *Global Crisis*
rebels in the countryside and contributing to the financial breakdown of the Baghdad treasury. Interaction between the Euphrates and Ottoman epidemiological, political, and financial crises was not a one-way process. The depopulation, rural unrest, and bankruptcy that changes in the Euphrates had fostered hampered effective hydraulic management and allowed the partial avulsion of the late 1680s to become full by 1700. When the dust had settled, literally (in the now-dry bed of the river), a new fluvial landscape was in place. Desert and river had changed places, Rumahiyya had crumbled, and a new political heavyweight, the Khaza’il tribe, would rise from its rubble. The story of their marshy kingdom belongs to the next chapter.
Chapter 7: Kings of the Middle Euphrates

“Among [the tribes of Iraq] are the Khaza’il… Word has it they are the clouds when they pour forth, and the lions when they charge.”


“The flames of depravity and anarchy ignited, and a shepherd in every area called for independence and proclaimed sovereignty,” wrote the high-ranking provincial official Murtaza Nazmizade in the aftermath of the avulsion of 1700.634 The time was ripe for Rumahiyya’s shepherds to deploy their herding and hunting skills, finely honed for many decades with Ottoman acquiescence, and to exploit the political advantages of a mobile pastoral life. This chapter documents how one pastoral tribe, the Khaza’il, filled the political vacuum created by river avulsion and the collapse of the Ottoman Rumahiyya fort by building its own power base in the adjacent marshes of Hasaka and Lamlum (see Figure 36). As we have seen in Chapter 5, the Tigris-Euphrates wetlands played a critical ecological role as vast nurseries for water buffalo and rice. The history of the Khaza’il confederation studied herein reveals another aspect of wetland environments—as hubs for political resistance and shelters from state persecution. Marshes of the Rumahiyya region became the Khaza’il’s headquarters from which they led a tribal confederation and became the most powerful political force in Iraq’s Middle Euphrates region throughout the eighteenth century.635

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635 Iraq’s Middle Euphrates refers to a section of the river situated at the heart of the alluvium, roughly between Musayyib and Samawa. See Figure 36.
Like the surrounding biota, the alluvial soils, and the marshes dotting the landscape, the Khaza‘il were embedded in the Euphrates system, comprised of the river and its floodplain. Cycles of flooding linked the river with the floodplain in a single biological community of interacting organisms. The water-mediated transfer of sediment, energy, and organic matter, referred to as hydrologic connectivity in ecological jargon, was crucial for the ecological integrity and very survival of the entire river system.\(^{636}\) The Khaza‘il’s political power and ability to challenge the Ottoman Empire in the eighteenth century hinged on the natural dynamic character of the Euphrates flow regime.

As long as they were hydrologically connected with the river’s main channel, the Khaza’il, like the aquatic and floodplain species along the Euphrates, were able to flourish. Hydrologic connectivity enabled the Khaza’il to raise their herds, grow their crops, build their huts and boats, and barricade themselves behind the marshes to carry out their acts of subversion of Ottoman authority. The hydrologically connected river and floodplain created the vibrant ecosystem at the foundation of the Khaza’il’s power. Their enemies’ assault on the movement of water within the ecosystem damaged that foundation, cut the Khaza’il’s hydrologic connectivity with the main channel, and ended their political dominance over the Middle Euphrates in the early nineteenth century. Nevertheless, Ottoman efforts to interrupt a complex and fluctuating natural process produced unexpected outcomes that changed the history of the Empire and its Iraqi provinces. Notably, they facilitated a westward channel shift in the Euphrates and the consolidation of Shi’ism as a majority religion in the region, an anathema to the staunchly Sunni Ottomans and their Arab allies.

The aim of this chapter is to bring an ecological approach, particularly the flood pulse concept, to the history of the Khaza’il tribe. Three ecologists proposed this model in 1989 to synthesize the study of river systems, and it continues to influence the field.637 On the premise that rivers and floodplains share the same water, sediment, and organic budgets, proponents of the flood pulse concept argue that the floodplain is an inseparable part of the main channel, and both together comprise a single dynamic system. The major force that determines the degree of their connectivity and wellbeing is the flood pulse, which provides a host of animals and plants with

water, silt, and nutrients crucial for their existence and growth. The alteration and obstruction of
the flood pulse depresses the biological productivity and diversity of rivers and floodplains.

In addition, an ecological perspective contributes to the study of Ottoman-tribal encounters in
Baghdad’s countryside. A major strand in the historiography approaches the tribes as a
“problem” and as an obstacle to Ottoman reforms. Stephen Longrigg, whose 1925 book remains
the most comprehensive account in English of Ottoman Iraq, wrote that the tribes were “so wild
and unmoral as to keep no bargain” with Ottoman authorities. Such narratives take the viewpoint
of the state and are mainly based on its sources. If state officials had experienced a “tribal problem”
in Iraq, many tribes could be said to have experienced a state problem, for which the Khaza’il
found an ecological solution among the reeds and water buffalo of the marshes.

**Genesis**

The Khaza’il tribe’s lightning political success at the turn of the eighteenth century came on the
heels of an ecological reconfiguration. As its channel migrated eastward, away from the
Rumahiyya fort and closer to Hasaka, the Euphrates flooded agricultural settlements on its way
and created enormous marshes, the largest of which resembling a sea called the Marsh of

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638 Gökhan Çetinsaya, “Tribal Problems,” in *Ottoman Administration of Iraq, 1890-1908* (New
York: Routledge, 2006), 72-98; Ebubekir Ceylan, *The Ottoman Origins of Modern Iraq: Political
Reform, Modernization and Development in the Nineteenth-Century Middle East* (New
639 Stephen Longrigg, *Four Centuries of Modern Iraq* (Oxford: Oxford University Press, 1925),
289.
640 For a critique of the literature that treats tribalism as a problem, see Richard Tapper,
“Anthropologists, Historians, and Tribespeople on Tribe and State Formation in the Middle
East,” in *Tribes and State Formation in the Middle East*, ed. Philip S. Khoury and Joseph
Kostiner (Berkeley: University of California Press, 1990), 48-73.
Salama.\textsuperscript{641} This natural event did not go unnoticed in Baghdad. According to Nazmizde, tribesmen with “a natural disposition to depravity and wretchedness” were quick to seize the opportunity. They refused to pay taxes and fortified their positions in the marshes.\textsuperscript{642} From the midst of an environmentally and politically fragmented landscape, a charismatic tribal leader emerged. \textsuperscript{643} ‘Abdulrahman al-Suwaydi, a typically disdainful city dweller, reports that a man “of ugly face,” “more debauched than a rat, and even more rotten,” proclaimed his sovereign rule in the region between Rumahiyya, Hasaka, Nahr-i Shahi, and Najaf and spread his call for independence among the neighboring tribes. The ugly, debauched, and rotten man was Sheikh Salman, son of ʿAbbas and leader of the Khazaʿil tribe. After transferring villagers to cultivate his newly conquered land, Sheikh Salman besieged the Hilla fort, the last pillar of Ottoman rule in Iraq’s Middle Euphrates region. The move prompted a swift intervention by Ottoman commandos (serdengeçti) and janissary troops, successfully repelling the brazen incursion but failing to dislodge Sheikh Salman from the areas under his control, where he collected taxes and behaved as a sovereign.\textsuperscript{644}

The rise of the Khazaʿil in 1700 marked a dramatic change in their fortunes. Similar to other pastoral groups worldwide, the Khazaʿil entered the historical record following their encounter with an agrarian, state-organized, and literate society. The Ottoman cadastral survey of Baghdad compiled around 1580 depicts them as a humble tribe in the Rumahiyya region, made up

\textsuperscript{642} Nazmizade, “Gülşen-i Hulefa,” fol. 176b; Nazmizade, “İcmal-i Sefer-i Nehr-i Ziyab,” ff. 75b-77b.
of 108 buffalo herders organized into seven groups. As a supplementary activity, they dabbled in sheep rearing (see Table 47). Even though they raised more sheep than buffalo, their sheep flocks (173 sheep in all) were significantly smaller than the average size maintained by the dedicated sheep breeders of Rumahiyya (about 521 sheep per group and village). They distinguished themselves primarily in buffalo rearing, maintaining a herd (113 head) almost double the average size of other buffalo breeders in the region (about 68 per group and village).645

Table 47. The Khaza‘il Tribe, c. 1580

<table>
<thead>
<tr>
<th>Group Name or Leader</th>
<th>Taxable Individuals</th>
<th>Buffalo Flock Size</th>
<th>Sheep Flock Size</th>
<th>Tax Total (akçe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheikh Khalifa</td>
<td>22</td>
<td>22</td>
<td>35</td>
<td>887</td>
</tr>
<tr>
<td>Sheikh Rumh</td>
<td>19</td>
<td>20</td>
<td>30</td>
<td>882</td>
</tr>
<tr>
<td>Sheikh Hasan</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>316</td>
</tr>
<tr>
<td>Al Abu ‘Akkash</td>
<td>12</td>
<td>12</td>
<td>18</td>
<td>485</td>
</tr>
<tr>
<td>Sheikh Ghanim</td>
<td>14</td>
<td>15</td>
<td>25</td>
<td>589</td>
</tr>
<tr>
<td>Sheikh Ma’an</td>
<td>25</td>
<td>26</td>
<td>40</td>
<td>1,026</td>
</tr>
<tr>
<td>Askar Ra‘is</td>
<td>9</td>
<td>10</td>
<td>15</td>
<td>393</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>108</strong></td>
<td><strong>113</strong></td>
<td><strong>173</strong></td>
<td><strong>4,578</strong></td>
</tr>
</tbody>
</table>

Sources: see Appendix A

Far from conferring prestige upon the Khaza‘il, buffalo rearing more than likely made them the object of scorn. Iraqi pastoral and agricultural tribes generally considered buffalo herding to be beneath them, despite their recognition of its profitability.646 The semi-aquatic buffalo were highly susceptible to infection from the helminth parasites that infest the wallows of the Euphrates,

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645 TKG.KK, TT 29, ff. 304a-467a.
as well as to sarcoptic mange in the dry season.\footnote{647} The anthropologist Shakir Mustafa Salim adds that the Arab disdain for buffalo breeding was traceable to the desert ethos of late antiquity, which prompted the Arab tribes encroaching on Iraq since the early first millennium to distinguish themselves from the local marsh people by occupation.\footnote{648} For whatever reasons, whether related to issues of health, hygiene, culture, or a combination of those factors, the Khaza’il enjoyed little prestige among their neighbors, far behind many of them in wealth and numbers.

The Safavid conquest of Baghdad in 1623 brought ephemeral prestige for the Shi’i tribesmen. Shah ’Abbas I (r. 1588-1629) appointed Sheikh Muhanna, son of Ali and leader of the Khaza’il then, as his vassal (khan) in the Middle Euphrates. The tribe’s political fortunes soon collapsed, however, when Murad IV re-conquered the region in late 1638. Three years later, an Ottoman platoon brutally crushed the tribesmen in their territory and presented Baghdad’s governor with 600 severed heads as war trophies. Survivors of the massacre, including the Khaza’il leader Sheikh Muhanna and his retinue, took refuge in the Safavid realm, where some remained while others returned to their homeland along the Euphrates in small groups during the following decades.\footnote{649}


Under the astute leadership of Sheikh Salman, the Khaza’il seized the opportunity provided by the channel shift in the Euphrates to transform their political standing in the region radically. A convicted tax felon and fugitive who broke out of a Baghdad prison around 1694, Sheikh Salman emerged in 1700 with a hefty military force of 10,000 men armed with muskets and spears. By 1701, he had brought most of Rumahiyya’s districts under his sway. The Khaza’il, the once-stigmatized buffalo herders, were now “kings of the Middle Euphrates.”

In the Bellies of the Marshes

After the expulsion of their Safavid patrons from Iraq in 1638, the lieutenant-governor of Baghdad Ali Agha swiftly obliterated the Khaza’il in a battle that did not last more than two hours. Defeating the tribesmen during the eighteenth century, however, was a more complicated affair, for they had allied this time not with Persia, but with a fluvial landscape that was wetter and muddier since the Euphrates avulsion in 1700. “In the bellies of the marshes” (fi butun al-ahwar), according to al-Suwaydi, the conventional battlefield tactics that defeated them earlier were doomed to failure.

The natural Euphrates pattern to spill over into swamps and depressions and to alter its course enabled the Khaza’il in Hasaka and Lamlum to pursue a way of life that puzzled outsiders. To travelers passing by their settlements, the Khaza’il seemed to be “really amphibious, for they live as much on water as on land.” “One could not better compare them but to the beavers of

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650 Al-Suwaydi, “Hadiqat al-Zawra’,” ff. 20a-23b.
653 Al-Suwaydi, “Hadiqat al-Zawra’,” ff. 36b, 146b, 150a.
654 Pauline Nostitz, Travels of Doctor and Madame Helfer in Syria, Mesopotamia, Burmah and Other Lands (London: Richard Bentley and Son, 1878), 1:281-2.
Canada,” noted one visitor.655 When the waters rise, “in a quarter of an hour, [they] can carry away their mat huts and regain dry land by swimming; men take their sabres, spears, and pots, and the women their children; I have seen a hundred times women cutting a handful of reeds, there placing their nursing infants and crossing the river; those children of 7 or 8 years follow them swimming.”656 Water buffalo assisted them in the process, carrying some of them on their backs and swimming “with superior skill… in a manner so that one only sees the tips of their noses.”657 Another traveler noted: “I have even seen a baby swinging in a cradle, suspended from the top of a reed hut, where, owing to a flooded state of the waters, the stream was flowing, in an unimpeded current, through the hut itself. Their familiarity with water commences thus at a very early age.”658

Some nineteenth-century observers attributed the Khaza’il’s physical traits to generations of lives spent in the marshes. Reflecting on his visit to their country in the 1830s, an English geologist later wrote: “Darwin had not at that time published his theory of evolution, but we were all struck with the unusual sinewy length and thinness of their limbs, a peculiarity of development which, as seen on a small scale in the shrimp girls of Boulogne, we could not but attribute to their living in a marsh. Their limbs, indeed, were often the subject of amusement, as approximating to those of storks or herons or other wading birds.”659

The Khaza’il’s marshy environment and their amphibious way of life were difficult for the Ottoman state to comprehend and control. Living in muddy terrain behind “thousands of canals that… render[ed] them inaccessible,” the Khaza’il earned a reputation for being “fierce and

656 M. de Beauchamp, “Voyage de Bagdad,” 294.
independent, and extremely jealous of all strangers who approach their haunts.”

Notably, they were jealous of state officials approaching their territory. Whenever instructed to comply with state demands, they retired into the center of their marshes, “like the otter to his den.”

“They know the ways in and out of them,” a chronicler wrote in the middle of the eighteenth century, “without which none of them would have survived.”

The administrative radius of Baghdad could extend to the far north in Mosul and to the far south in Basra. However, the Khaza’il’s marshes, though only a couple days’ ride from Baghdad, formed a geographical irregularity that checked the extension of state power. In the words of James Scott, “Political control sweeps readily across a flat terrain. Once it confronts the friction of distance, abrupt changes in altitude, ruggedness of terrain, and the political obstacle of population dispersion and mixed cultivation, it runs out of political breath.”

In political terms, therefore, the Tigris-Euphrates marshes resembled the mountains of the Mediterranean as “asylums of liberties,” “out of reach of the pressures and tyrannies of civilization,” in the words of Fernand Braudel.

For much of recorded history, they appeared in this manner, as they did on the carved wall panels of King Sennacherib’s (r. 704-681 BC) palace

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660 J. Baillie Fraser, *Travels in Koordistan, Mesopotamia, & c., including an Account of Parts of Those Countries hitherto Unvisited by Europeans with Sketches of the Character and Manners of the Koordish and Arab Tribes* (London: Richard Bentley, 1840), 2:122; M. de Beauchamp, “Voyage de Bagdad,” 294.

661 Fraser, *Travels in Koordistan*, 2:123.


in Nineveh. A panel housed in the British Museum in London depicts a scene from the Assyrian conquest campaign of Babylonia at the turn of the seventh century BC, in which a heavily-armed Assyrian soldier chases away a half-naked Babylonian horseman into a clump of reeds and shallow sheets of water.\textsuperscript{666} Abbasid literature portrays them in a similar fashion, notably in their chronicle of the African slaves’ revolt in the Basra marshes during the late ninth century.\textsuperscript{667} The reputation of the Tigris-Euphrates marshes as hideouts from centralized control endured well into the Ottoman period. “Basora in times past,” wrote an English merchant visiting the region in 1583, “was vnder the Arabians, but now is subject to the Turke. But some of them the Turke cannot subdue, for that they holde certaine Ilandes in the riuer Euphrates which the Turke cannot winne of them. They be theuees all and haue no setled dwelling, but remoue from place to place with their Camels, goates, and horses, wiuys and children and all.”\textsuperscript{668} In the marshes of Hasaka and Lamlum during the eighteenth century, the Khaza‘il continued the legacy of a long line of renegades, outcasts, and rebels that spanned millennia.

Settling the marshes was not only a political but also an environmental adaptation. Aside from their role as a natural political ally against the state, marshes served the Khaza‘il as an ecological niche where they could combine animal husbandry with cultivation and sustain their livelihood. The subsistence package the Khaza‘il devised rested on raising water buffalo and sheep

\textsuperscript{666} Object 124773, British Museum. For more details, see Reallexikon der Assyriologie (Berlin: Walter de Gruyter, 1993-1997), s. v. “Meerland” (J. A. Brinkman); Grant Frame, “The Political History and Historical Geography of the Aramean, Chaldean, and Arab Tribes in Babylonia in the Neo-Assyrian Period,” in Arameans, Chaldeans, and Arabs in Babylonia and Palestine in the First Millennium B.C., ed. Angelika Berlejung and Michael P. Streck (Wiesbaden: Harrassowitz Verlag, 2013), 114-116.


\textsuperscript{668} J. Horton Ryley, Ralph Fitch, England’s Pioneer to India and Burma; His Companions and Contemporaries, With His Remarkable Narrative Told in His Own Words (London: T. F. Unwin, 1899), 53.
and growing rice. So large were their herds that, in 1795, they bought off an Ottoman siege by offering Baghdad 70,000 sheep and 700 water buffalo. Water buffalo offered milk and milk products as well as dung used as a fuel and mortaring material, and sheep were useful for their meat and wool. Marshy environments impose limits on the number of sheep their dwellers raise, but the Khaza’il confederation included many nomadic and pastoral groups responsible for raising sheep in surrounding areas. In moist soils where marsh waters retreated, the Khaza’il grew rice. Their rice paddies, according to one estimate in 1800, extended from the Euphrates to a considerable distance of thirty to forty miles inland. Awestruck by the fertility of their rice fields, the French Consul in Baghdad in 1796-1798 remarked: “Rice there is proliferating in an extraordinary way.” “Just open a furrow of two or three inches deep to deposit the seed, nature does the rest, and the work of the laborer is amply rewarded at harvest time.” Rice complemented other economic activities in the marshes. When threshed, their straw could be used as animal fodder and added with clay for construction.

Leaders of the Khaza’il appointed

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671 For a detailed discussion of sheep and buffalo herding, see Chapters 4 and 5, respectively.


673 “Correspondence, mainly of Sir Harford Jones, with 1st and 2nd Viscounts Melville: 1785-1820,” British Library, Add. MS 41767, ff. 81a-84a (7 October 1800), reference in 82a.


representatives for each tribe in their confederation to oversee the cultivation of rice fields under their control and became major suppliers of the crop in the region.676

The hybrid mode of production the Khaza’il’s pursued in the marshes was both an economic and political decision, a grand strategy that effectively responded to the risks they constantly faced at the time. Rice cultivation increased the quantity of edible calories per acre and allowed them to support a greater population density than groups engaged in unadulterated pastoralism. By their sheer numbers, they could share risks and pool more laborers and warriors during their farm chores and military battles. In addition to their role as farmlands, rice paddies formed natural defensive works. “The shallows,” according to the British East India Company resident Harford Jones in 1800, “owe their origin to the Drains made by the Ghesaal [Khaza’il] Arabs from the River for the purposes, alike of the cultivation of Rice, and of Defense and security against the troops of the Pashaw. The Passage through them sometimes presents a frightful Marsh overgrown with Reeds, and sometimes little streams of a few feet wide, and not deeper than mid-leg.”677 Such country, he added, “frequently oblige[s] an army to make considerable detours into the Desert, and to lose sight for a day or two of the transport Boats proceeding up the stream.”678 Furthermore, because they raised water buffalo and sheep, the Khaza’il could afford greater long-term resilience than other groups solely specialized in cultivation. As mobile forms of capital, sheep and water buffalo were subsistence resources that could be held in reserve without being subject to the same set of natural hazards as crops and were capable of being moved from one location to another during times of crises. The reliance on a wide range of resources formed a

676 Al-Sa’idi, Al-Khaza’il, 115.
677 “Correspondence, mainly of Sir Harford Jones, with 1st and 2nd Viscounts Melville: 1785-1820,” British Library, Add. MS 41767, ff. 81a-84a (7 October 1800), quotation from fol. 82a.
678 “Correspondence, mainly of Sir Harford Jones, with 1st and 2nd Viscounts Melville: 1785-1820,” British Library, Add. MS 41767, ff. 81a-84a (7 October 1800), fol. 82a.
dietary safety net that protected the Khazaʾil from political and environmental shocks and held the threat of land overexploitation at bay.679

The wealth surplus the Khazaʾil accumulated in their marshes provided them with the means to obtain luxury items from sedentary communities, such as coffee and tobacco. A guest in one of their huts in 1779 observed: “When any person goes in to sit, [he] drinks coffee, and [they] smoke their pipes or nargils [narghile]… [There was] a hole made near the entrance for the fire, at which the coffee, according to the Arab custom, was roasted and pounded, and then boiled, from this fire they light their pipes.”680

Marshes provided the Khazaʾil with the equivalent of forests and coral reefs, supporting a diverse array of wildlife and containing numerous natural resources. They offered plentiful protein in the form of fish, notably barbels, traditionally an important component of marsh dwellers’ diet. Moreover, fish made excellent live baits for other useful creatures such as otters, which locals hunted for their fur.681 The Euphrates flood pulse brought nutrients that encouraged the growth of tall and coarse reeds, a staple building material used for the construction of houses, fences, mats, baskets, and boats.682 Contemporary observers were impressed by the efficiency of the Khazaʾil in


680 A Journal Kept on a Journey from Bassora to Bagdad; Over the Little Desert to Aleppo, Cyprus, Rhodes, Zante, Corfu, and Otranto, in Italy; in the Year 1779 (Horsham: J. F. and C. Rivington, 1784), 31.


converting stands of reeds into “a village of straw, in which there are houses made with a great
deal of art,” as well as numerous boats, “very well woven, and very well dressed with bitumen,
which gives them a great lightness.”683 In addition, reeds served as a fuel and at the right season
could be burned off, making way for fresh forage to provide water buffalo and cattle with spring
grazing.684 Aside from fish and reeds, the marshes were a thriving habitat for waterfowl, otters,
frogs, francolins (a variety of pheasant), and marbled teals (ducks), to name just a few animals.

This view of useful marshes contradicts the historical negative portrayals of wetlands by
many societies around the world. Their cold and dark waters, overgrown with vegetation that
rendered them inaccessible, fostered ideas about them as unproductive wastelands, diseased
landscapes, lawless areas, and even haunted enclaves.685 An angry proclamation by an official of
the Ming Dynasty (1368-1644) best exemplifies the attitudes of premodern agrarian societies
toward wetlands. “Stop the minor profit of the occupants of reedlands and grasslands!” he asserted.
“Registered wasteland is wasteland. Having reeds and grasses, still makes it wasteland. Yet, some
lazy people, without consideration for the land-term future, go after the minor profits of reeds and
reject the great treasure of cultivation of crops.”686 For al-Suwaydi, the marshes were dens of sleaze
where some tribes lived in order to practice incest.687

In short, along the high degree of hydrologic connectivity between the river and floodplain
created the ecological context for the emergence of the Khazaʿil as a major political force in
Ottoman Iraq. The post-1700 Euphrates channel revived the marshes of Hasaka and Lamlum, their

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684 Evans, “The Ecosystem,” 212.
685 For an elaboration of this point in the British context, see Vittoria Di Palma, Wasteland: A
686 Quoted in John F. Richards, The Unending Frontier: An Environmental History of the Early
Modern World (Berkeley: University of California Press, 2003), 120.
687 Al-Suwaydi, “Hadiqat al-Zawraʿ,” ff. 28a-b.
biota, and the fortunes of their human population, especially the Khazaʿil in their attempt to deal with their acute state problem. The marshland was a political ally against state power and a valuable ecological niche, rich with natural resources.

The Lord of Water and Mud

In a foreboding letter delivered after the avulsion of 1700, Baghdad’s newly-installed governor Daltaban Mustafa Pasha warned Sheikh Salman, leader of the Khazaʿil, that non-cooperative tribes in the region risked having their ears pulled and noses broken. The forces of nature could anytime turn against them. “When the wrath of the Padishah [Sultan] becomes manifest, in God we seek refuge [from such outcome], the rock and clay, the beasts of the land and the sea, and even the bird on the tree will be your enemies,” the letter added. More importantly, Daltaban Mustafa Pasha informed Sheikh Salman that his rebellious activities pitted him against the Ottoman sultan, “the Lord of Water and Mud” (gahraman al-maʿ wa al-tin). This is an unusual title for the sultan, and it served as an ominous warning to Sheikh Salman and his followers about what could happen to their marshland fortifications if they continued to defy imperial orders. The Ottoman Empire was willing to pursue hydraulic warfare and manipulate the arrangement of water and mud on the Euphrates floodplains in order to crush those who dared to challenge the sultan’s authority.

When Sheikh Salman received the warning letter, he reportedly replied with “arrogant and ignorant gibberish, with some irrelevant words [put together],” so “he deserved reproach and

Baghdad waged several campaigns against his confederation, but they all resulted in Ottoman defeat. To destroy them, the Ottomans had to destroy the new Euphrates channel that brought them to power in the first place. It was in this context that Mustafa II, the Lord of Water and Mud, finally decided to finance the engineering expedition tasked with diverting the Euphrates back to its pre-1700 bed, an ambitious mission detailed in Chapter 6.

In December 1701, when the Ottoman expedition encamped west of the Euphrates to begin the engineering project, Sheikh Salman was in Hasaka on the opposite bank issuing letters to different Arab tribes requesting a general levy on all able-bodied men for an impending battle. With support from the great Arab tribes of Shammar, Zubayd, and Muntafiq, he assembled a force of more than forty thousand cavalry and infantry. From a dim and narrow thicket, the Khaza’il coalition waged a surprise attack but was soon outgunned by Ottoman artillery that terrified them. Many of the Khaza’il slipped away into the marshes, some of them, including Sheikh Salman, survived, while others drowned in the Euphrates as they ran in a blind panic. Ottoman forces captured more than 10,000 prisoners, cut off the thumbs of some, beheaded others, and set a number of houses ablaze. They celebrated the final victory by assembling the heads they severed into several heaps, and “the bellies of the lions, beasts, and birds became graves for their wretched corpses.”

Triumphant Ottoman accounts of the event mistakenly considered the campaign as a defeat for the Khaza’il. Nazmizade rejoiced in their reaction to Ottoman artillery, writing that they fled

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like “scattering locusts and donkeys running amok.”

Flight, however, was a viable option the Khaza’il chose whenever defeat seemed imminent. By scattering, they became, as Scott puts it, “invisible or unattractive as objects of appropriation.” Once circumstances were favorable, the Khaza’il would normally reemerge from their marshes. In April 1702, a few days after returning to Baghdad, the Ottoman expedition received letters from newly-appointed officials in Hasaka containing some disturbing news. Sheikh Salman was back to retake the district. Outnumbered by his followers, they surrendered Hasaka to him.

Throughout the eighteenth century, the Khaza’il and Ottomans clashed regularly, but their relationship was complex and not always antagonistic. Chroniclers mentioned times when they traded and cooperated. The “eccentricities of grass” in the Middle East partly explain the complex relationship between urban Baghdad and the rural Middle Euphrates. According to J. R. McNeill, the Middle East “is one of the few places on Earth where grasslands and arable lands exist in a mosaic.” Unlike most world regions, grasslands and the pastoralists they attract have been unusually close to the Middle East’s urban centers. The mosaic pattern of grasslands and arable lands, McNeill argues, “maximized the interaction between pastoralists and farmers, between tribal confederations and agrarian states,” more so than in other world regions.


695 Nazmizade, “İcmal-i Sefer-i Nehr-i Ziyab,” ff. 90b-91a; Nazmizade, “Gülşen-i Hulefa,” fol. 189b. On the surrender of Hasaka to Sheikh Salman in April 1702, consult İbrahim Mütferrika’s (d. 1745) printed version of Nazmizade’s manuscripts, which is more explicit about event. Murtaza Nazmizade, Gülşen-i Hulefa (Istanbul: Darü’-t-Tıbaati’l-Amire, 1143/1730), 122b.

This eccentric ecology had implications that manifested themselves in Ottoman Iraq during the Khaza’īl-Ottoman encounter. Ottoman expeditions from Baghdad to Hasaka normally took three nights. The proximity of Hasaka to Baghdad brought its rural economy into tight harness with Baghdad’s urban economy. The Ottomans needed rice, a staple of their diet, which was grown in fields under the Khaza’īl’s control, and the Khaza’īl needed access to Ottoman-controlled urban markets. Occasionally, the Khaza’īl were Baghdad’s main rice suppliers. In addition, the fragmentation of grassland and arable lands in the region facilitated the formation of military alliances between Ottoman urban centers and pastoralist communities. In other ecological settings, such as China’s, where the steppe-sown dichotomy was sharper, military alliances between pastoral communities and agrarian states were less common. In Iraq, on the other hand, Ottoman-pastoralist military alliances were particularly common and important during Ottoman campaigns against the empire’s frontier enemies. In one instance, the imperial administration ordered the governor of Baghdad, Hasan Pasha, to invade parts of western Persia with the support of Iraq’s tribes following the collapse of the Safavid Empire in 1722. Among the tribes joining Ottoman war efforts were the Khaza’īl, led by Sheikh Salman himself, who had been until a few years earlier Baghdad’s primary bête noire.

\[\text{697} \text{ Ottoman forces spent three nights on their way from Baghdad to Hasaka in 1705. Al-Suwaydi, “Hadiqat al-Zawra,’” fol. 21b.}\]
\[\text{698} \text{ Rousseau, Description du Pachalik de Bagdad, 59.}\]
\[\text{699} \text{ Reşat Kasaba, A Moveable Empire: Ottoman Nomads, Migrants, and Refugees (Seattle: University of Washington Press, 2009), 33.}\]
\[\text{702} \text{ Abbas al-’Azzawi, Mawsu’at Tarikh al-Iraq Bayna Ihtilalayn (Beirut: al-Dar al-’Arabiyya li’l-Mawsu’at, 2004), 5:206. In 1718, four years before fighting alongside each other, Sheikh}\]
Conflict, however, supplanted cooperation, especially under the rule of ambitious, centralizing governors in Baghdad. Contemporary chroniclers documented battles fought in 1701, 1708, 1764, 1781, 1784, 1800, and 1801, when the Ottomans waged expeditions to subdue the Khaza‘il by forcibly isolating them, their neighbors, and their floodplain from the Euphrates.\textsuperscript{703} The sources are particularly rich and provide great detail about Ottoman damming and drainage efforts during the campaigns of 1708 and 1781.

Nazmizade and al-Suwaydi documented the 1708 campaign. Since the 1680s, a prolonged war with the Holy League in the west and changes in the Euphrates in the east eroded all semblance of the Ottoman order in Iraq. Pastoralists, meanwhile, had free rein to stake out their own fiefdoms.\textsuperscript{704} The chaotic state of affairs came to an end in 1704 with Istanbul’s appointment of Hasan Pasha as governor of Baghdad, who ruled for twenty years (1704-24) and was determined to subdue the rural areas. Once in power, he distributed a proclamation to the tribes urging them to show loyalty and pay tribute to the new administration. The Pasha concluded his letter with a severe warning cribbed from the Quran: “When We decide to destroy a town, We command those corrupted by wealth [to reform], but they [persist in their] disobedience; Our sentence is passed, and We destroy them utterly” (17:17).\textsuperscript{705}

Salman and Hasan Pasha worked out a settlement that fulfilled the interests of both. Al-Suwaydi, “Hadiqat al-Zawra’,” fol. 42b.


\textsuperscript{704} Al-Suwaydi, “Hadiqat al-Zawra’,” fol. 12a.

\textsuperscript{705} For the entire proclamation, see Al-Suwaydi, “Hadiqat al-Zawra’,” ff. 15a-16a.
Destroying the Khaza’il’s power was a priority for Hasan Pasha. In 1705, he led an expedition to Hasaka but found no trace of them. Aware of the defeat the governor had just inflicted on another tribe on the Tigris River, Sheikh Salman and his followers fled through the marshes to seek refuge with the Muntafiq tribe that dominated the south around Basra. The Pasha was not prepared to fight the Khaza’il and Muntafiq together, so he appointed officials to Hasaka and its surrounding towns and returned to Baghdad.706

Three years later, Hasan Pasha assembled a force of 50,000 men and headed to Basra to fight the Muntafiq and Khaza’il. One historian estimates that Muntafiq and Khaza’il forces, joined by other tribes in Iraq and eastern Arabia, numbered about 100,000.707 When Hasan Pasha arrived in the vicinity of Basra, he was puzzled by a floodplain enmeshed in the Euphrates and punctuated by marshes, river branches, reeds, and trees that stood on his way. The Muntafiq and Khaza’il had barricaded themselves between the marshes along the ‘Antar River, one of multiple channels joining the Euphrates. Ottoman forces decided to drain their foes’ floodplain by damming the ‘Antar River. They used large and heavy pieces of wood, each carried by around 50 men, pulled them from each side of the river by heavy ropes, and laid on them multiple layers of soil, sand, and more wood. In two days, Ottoman forces sealed the ‘Antar River near its juncture with the Euphrates. Only then were they able to advance and engage their enemies, waging a fierce battle that lasted for several weeks. When the Muntafiq and Khaza’il decided to retreat and disperse, “they sloshed the waters as the night fell.”708

A battle fought in 1781 further illustrates Ottoman Baghdad’s hydraulic warfare to disconnect the Euphrates from its floodplain as a strategy of defeating the Khaza’il. The

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707 Al-‘Azzawi, Mawsu‘at Tarikh al-Iraq, 5:176.
confrontation marked the beginning of the most contentious period in the Khaza’il’s encounter with the provincial administration. In 1780, the imperial administration appointed Büyük Süleyman Pasha (r. 1780-1802) to rule Iraq after a period of devastating plagues, Ottoman wars with Russia, an urban rebellion, and a Persian occupation of Basra.709 He imported a large number of Georgian slaves to restore Baghdad’s military strength and sent several regiments to reestablish Ottoman control over the countryside. Under his leadership, his army began to implement the Nizam-ı Cedid reforms (1792-1807) inaugurated by Selim III (r. 1789-1807) and adopted European methods of training and discipline.710 Furthermore, Büyük Süleyman allied with Sheikh Thuwayni (d. 1797), leader of the Muntafiq tribe, who enabled the governor to reassert Ottoman control over Basra.711 Just as a powerful governor emerged in Baghdad, the Middle Euphrates witnessed the emergence of the most powerful tribal leader in the history of the Khaza’il, Hamad al-Homud (d. 1799), who restored his tribe’s power in Hasaka and vigorously challenged Büyük Süleyman’s centralizing impulses.

Like former powerful governors, Büyük Süleyman was determined to bring autonomous tribes, particularly the Khaza’il, under his control. A few months after his arrival at Baghdad as governor, he led an expedition against the Khaza’il with the aim of “teaching these amphibious

709 Khoury, “Violence and Spatial Politics,” 188-197. Contemporary Turkish, Arabic, and European sources described Süleyman Pasha as such until his death, when adding the nickname “Büyük,” “al-Kabir,” or “the Great” became widespread due to his stature and the need to distinguish him from two other governors of Baghdad with the same name, Süleyman Abu Layla (r. 1750-1762) and Küçük Süleyman (r. 1807-1810). Mehmed Süreyya, Sicill-i Osmani (Istanbul: Darü’t-Tibaati’l-Amire, 1311/1893), 3:91-92.
savages to know their master.”

According to ʿOthman al-Basri (ca. 1766-1827), a contemporary Sunni cleric from Basra, as soon as Ottoman forces approached, the Khazaʿil broke their reed dams, flooded their enemies, and barricaded themselves in their marshes. In response, al-Basri writes: “[When] the vizier [Büyük Süleyman] knew he could not destroy and obliterate them [the Khazaʿil] unless he shuts those waters, he ordered that they be dammed.”

Al-Basri likened the dam Büyük Süleyman constructed on the Euphrates against the Khazaʿil to the building of the great wall that kept the barbarian Gog and Magog at bay.

Another contemporary account of the same event by Kerküklü Resul Havi Efendi (d. 1826) explicitly stresses the link between the political fortunes of the Khazaʿil and the fate of their aquatic environment. Two months after the beginning of the damming project, he wrote, the Khazaʿil “were hopeless and deprived from living water, the source of the animal’s and plant’s life, and were extremely anxious about the prospect of being overwhelmed by drought and desiccation.” Therefore, they surrendered.

This detail demonstrates that hydrologic connectivity between the Euphrates and its floodplain was an issue of life and death not only for the biota of river-floodplain systems, as ecologists point out, but also for their human communities. Kerküklü emphasized that the forced separation of the floodplain from the main channel weakened an entire ecosystem held together by water, and its weakening entailed the Khazaʿil’s surrender.

In the short term, Ottoman hydraulic warfare against the Khazaʿil achieved its aim and led to the Khazaʿil’s temporary surrender or flight. The long-term consequences, however, were more enduring and unexpected. While digging the earth, carrying wood, and diverting the river, Ottoman

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712 Fraser, *Travels in Koordistan*, 2:123.
714 A similar analogy was made by al-Suwaydi, “Wurud Hadiqat al-Wuzaraʾ,” 37a.
715 Kerküklü, *Devhatül Vüzera*, 197.
forces were not aware that the landscape they were recreating would, in a matter of time, escape their control and shake the foundations of Ottoman power in the region.

**Seeing the Euphrates Like a State**

The unhindered advance and retreat of floodwaters on the Euphrates floodplain created amphibious human settlements that posed a problem to Ottoman statecraft. State interventions in such environments were difficult and often self-defeating. Isolating the Euphrates from its floodplain by damming the river and draining the floodplain were attempts to simplify the environment of the Middle Euphrates in ways that facilitated Ottoman state functions of taxation and prevention of rebellion.716

However, Ottoman simplification measures to bring the floodplain and its dwellers under control clashed with the intricacies and flux of the Euphrates. They interrupted a fluid and complex natural process that involved the movement of water, sediment, organic matter, and nutrients in three dimensions: longitudinal (upstream-downstream), lateral (riverine-floodplain), and vertical (riverine-groundwater).717 Ottoman efforts to subdue the Khaza’i1’s environment during their punitive campaigns required a narrowing of vision that ignored the intricate workings of the Euphrates system and focused on one political objective—bringing the rebels to heel. The Ottomans succeeded in weakening the Khaza’i1 by the early nineteenth century; nevertheless, by seeing the Euphrates like a state, they triggered a chain of unintended consequences that transformed the history of the empire and Iraq.

By repeatedly damming the Euphrates and draining its floodplain, the Ottomans severely degraded the main channel. Ottoman efforts to interrupt the lateral movement of water between the river and its floodplain had the unintended consequence of severing the longitudinal connectivity between the upstream and downstream segments of the main channel. Longitudinal water flow in river regimes erodes soil and rock and redistributes sedimentary materials, organic matter, and nutrients that create the river’s very channel and nurture the river’s biota. Dams interrupt this movement, trap the sediment load, and induce sedimentation and aggradation upstream of the impoundment. Downstream, they induce erosion of the riverbed.

The natural and historical conditions of the Euphrates in the eighteenth century made it particularly vulnerable to the longitudinal consequences of Ottoman damming projects. Its silt load (four to five times greater than the Nile) and slow current induce silt deposition within the river that regularly elevated its bed. Sedimentation upstream of multiple Ottoman impoundments targeting the Khazaʿil and their neighbors exacerbated the natural accumulation of silt within the riverbed. Downstream, the river’s slow current crosses a vast stretch of desert-steppe. Under the parching heat of summer, much of the river’s water evaporates. The Khazaʿil and their neighbors, engaged in the cultivation of water-thirsty crops, siphoned off additional large amounts of water. The river’s flood pulse dissipated more water that ended up in the marshes and the flat floodplain.

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720 Church et al., “Rivers,” 108.

721 For more on silt transport and deposition in the Tigris and Euphrates, see Chapter 3.
Largely lost to evaporation, irrigation, and flooding, the Euphrates’ water diminishes as one moves south and hardly reaches the Persian Gulf. Ottoman damming projects further degraded a river channel already vulnerable to siltation and riverbed erosion.

As the main Euphrates channel experienced severe siltation and clogging, Ottoman hydraulic warfare pressured the Euphrates to abandon its course and move into a newly constructed canal further west. The canal, curiously enough, was the project of a ruler of the north Indian state of Awadh, Nawab Asafu’d-Dawlah (r. 1774-97), whose Nishapuri family ruled an autonomous polity in Awadh since 1722. The family was Shiʿi and had strong ties with the shrine cities of Iraq in the Middle Euphrates, Najaf and Karbala (see Figure 37). Both cities were theological and religious centers that grew around the tombs of seventh-century Shiʿi saints and hosted Shiʿis from around the world, including India, making pilgrimage and pursuing religious education. However, Najaf suffered in the eighteenth century from acute water shortage. To quench the thirst of Najaf’s inhabitants and revive pilgrimage to the city, Asafu’d-Dawlah sponsored the construction of a canal from the Euphrates below Musayyib all the way to Najaf. The project, named the Hindiyya (Indian) Canal, was completed in 1793 (see Figure 37).

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722 Potts, Mesopotamian Civilization, 9-12.
The environmental consequences of Ottoman hydraulic warfare against the Khaza’il and their neighbors and the construction of the Hindiyya Canal intertwined, facilitating the Euphrates’ shift from the main channel (later called the Hilla Channel) to the Hindiyya. Landscape archaeologists studying Mesopotamian channel systems observed that sediment accumulation and channel clogging were major historical forces driving the process of avulsion and channel shifts in the Euphrates. Repeated Ottoman closures of the lower reaches of the Euphrates during their punitive campaigns throughout the eighteenth century reactivated these forces and pushed the river toward a threshold condition in which a channel shift was very likely. The construction of the Hindiyya Canal in 1793 was timely. It offered the Euphrates a more suitable conduit to flow than its sediment-choked Hilla Channel. By the middle of the nineteenth century, the Hindiyya absorbed

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the bulk of the Euphrates’ water, ultimately leaving the main Hilla Channel dry and sandy (see Figure 38).\textsuperscript{726}

Consequently, the Khaza’il’s domination over the Middle Euphrates came to an end. In the early decades of the nineteenth century, as the Hindiyya Canal absorbed more water and expanded,

the Euphrates continued to maintain its flow in the old Hilla Channel, but the floodplain around it was drying out. The river and floodplain of the Middle Euphrates, once intimate partners, grew aloof from each other. As a result, the Khaza’il and their allies, who had been based in the floodplain of the old Hilla Channel since 1700, began to permanently lose their connectivity with the Euphrates and scattered around the region as their canals, marshes, and agricultural areas dried out. Throughout his journey in the region in 1849-50, a passerby noted “deserted cities,” “ruined mud houses among the surrounding date groves,” and dry canals and river channels that “must formerly have been of considerable importance.”\(^727\) The Khaza’il themselves abandoned their marshes in Hasaka and Lamlum in the 1830s. The Ottomans seized this opportunity to further weaken them by distributing their lands to different tribes.\(^728\) The Khaza’il remained influential, but the deterioration of their environment and the migration of many of their tribal allies considerably weakened the once-mighty tribal confederation they once led. After the early nineteenth century, their confederation was no longer the vanguard of anti-state uprisings in the region and became merely one tribal force among several others.\(^729\)

With the demise of the Hilla Channel, the Ottoman provincial administration suffered major economic losses. Since the avulsion of 1700, rich agricultural areas gradually developed around the new Hilla Channel. Baghdad, as a result, became interested in keeping the river in its

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\(^728\) Al-Sa‘idi, *Al-Khaza’il*, 82-3, 98-9. In the early twentieth century, British colonial officials were still mediating land disputes between the Khaza’il and other tribes caused by Ottoman measures to expropriate the Khaza’il’s lands and to sell them to others. For a case in point, see James Saumarez Mann, *An Administrator in the Making: James Saumarez Mann, 1893-1920* (London: Longmans, Green, and Co., 1921), 185-186.

place. By the middle of the eighteenth century, al-Suwaydi and French envoy Jean Otter noted that Hasaka was the richest land in Iraq and “one of the richest countries of Arabia in food.”

Had they seen the region a century later, they probably would have been amazed. In 1889, John Punnett Peters, director of the University of Pennsylvania Expedition to Babylonia, wrote during a visit to Hilla, about 50 miles north of Hasaka: “In the neighborhood of Hillah, and down the course of the Euphrates, land which was cultivated a few years earlier was at the time of my visit lying waste; and the very palm-trees, which line the river for miles at this point, were dying on account of the failing of the waters.”

People told him that the revenues of Hilla were 85,000 Turkish liras five years ago. By the time of his visit, they were merely 10,000.

Perhaps most importantly, Ottoman hydraulic warfare facilitated the consolidation of Shi‘ism as a majority religion in Iraq. Before the late eighteenth century, Shi‘ism in Iraq was largely confined to urban centers where only a minority of the region’s population lived. With the exception of a few, including the Khaza‘il who had been Shi‘i earlier, the majority of tribal confederations in Iraq were Sunni. The process of mass conversion to Shi‘ism began in the late eighteenth century with the revival of the Shi‘i shrine cities of Karbala and Najaf. As the Euphrates shifted its course to the Hindiyya Canal under the pressure of Ottoman damming and drainage projects as detailed above, the Hindiyya coursing through Najaf made a great improvement to the city’s water supply. It enabled Najaf to “sustain dynamic academic activity as many new madrasas were built to accommodate the large number of students who flocked to the city to study with the leading mujtahids [high-ranking religious scholars] of the day.”

In addition, the water-rich

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732 Nakash, *Shi‘is of Iraq*, 241.
shrine cities attracted tribes and exposed them to Shi’ism. Shi’i clerics, meanwhile, engaged in
intensive missionary activity to convert tribal confederations in their hinterlands. Ibrahim al-
Haydari (d. 1882), a Sunni cleric from a notable family in Baghdad, observed various tribes in the
region converting to Shi’ism “because of Rafidi [Shi’i] devils frequenting them.” Feeling they
were heavily taxed and mistreated by the Sunni Ottoman government, the vast majority of the
tribes embraced Shi’ism and its message that highlighted government oppression and tyranny.

As a result, even though Ottoman dams partly solved the Khaza’il component of the “tribal
problem,” a “Shi’i problem” resurfaced. During the reign of Abdülhamid II (1876-1909), the
spread of Shi’ism in Iraq preoccupied Ottoman policy makers and elites. After he lost most of his
Balkan territories and Christian subjects in the aftermath of the war with Russia in 1877-1878,
Abdülhamid sought to emphasize the religious unity of his empire and his role as a universal
Islamic leader, “Caliph of Islam,” and “Commander of the Faithful.” However, Ottoman officials
viewed the spread of Shi’ism in one of the empire’s most important remaining provinces as a
“moral invasion” orchestrated by their Shi’i rivals in Tehran that threatened the religious
legitimacy of the sultan and the integrity of his domains. Until the British occupation of Iraq during
World War I, Ottoman officials were preoccupied with the spread of Shi’ism.

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733 Ibrahim Fasih al-Haydari, “‘Unwan al-Majd fi Bayan Ahwal Baghdad wa Basra wa Najd,” Süleymaniye Kütüphanesi, Bağdatlı Vehbi MSS 1327, fol. 64a.
Conclusion

The rise and fall of the Khaza‘il’s political dominance in the Middle Euphrates in the eighteenth century is strongly linked with the history of the Euphrates. The ebb and flow of water between a unified river and floodplain interwove the tribe’s fortunes with the fate of an entire ecosystem. The Khaza‘il, like numerous nonhuman species around them, were able to flourish due to their hydrologic connectivity with the main channel. The Euphrates irrigated their rice fields, sustained their sheep and water buffalo, nourished their reeds and fish, erected their natural barricades, and enabled them to become the most powerful political force in the Middle Euphrates. For this reason, to subdue them, their enemies sought to cut their water supply, which they ultimately achieved by the early decades of the nineteenth century. Thereafter, the Khaza‘il continued to play an important role in the history of Iraq, but they lost dominion over their region.

However, the weakening of the Khaza‘il did not mean the Ottomans emerged victorious. Ottoman perturbations of the Euphrates system by frequent damming of the river and drainage of the floodplain separated partners locked in an intimate embrace, to the detriment of both the river and floodplain, and to the Ottoman Empire. Ottoman punitive measures played a major role in drying up of the original Hilla Channel and the death of its floodplain, at the time the richest in Iraq and most valuable to the Ottomans. In addition, Ottoman measures against the Khaza‘il and their neighbors might have tackled the “tribal problem” the empire faced in its frontiers but had the unintended consequence of resurrecting and complicating its “Shi‘i problem” that would preoccupy state officials for decades to come. Seeing the Euphrates like a state proved, in the long run, to be a narrow and costly view.

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Conclusion: After the Flood

Shi‘ism’s consolidation in the nineteenth century is a striking case that encapsulates the historical paradox of the Tigris and Euphrates around which this entire project has revolved. The same rivers that channeled the flow of Ottoman power into eastern Syria and Iraq for 300 years caused its abrupt derailment. Istanbul had limited options to deal with avulsion. Its investment to harness the rivers to its advantage left provincial authorities and institutions at the mercy of a dynamic ecosystem, constantly evolving of its own accord and in response to anthropogenic pressures.

In particular, the river channels underwent constant evolution in the Iraqi alluvial plain, where the Tigris and Euphrates flowed in silt-encased channels above the surrounding terrain with minimal geographical restrictions. Here, towns and cities formed a palimpsest, scraped clean and re-inscribed by the annual rhythm of the river system. Twice at the turn of the eighteenth and nineteenth centuries, as the Euphrates reconfigured its course, it reconfigured the political landscape around it. It wreaked havoc on centuries-old imperial forts and settlements and gave birth to new ones. In the processes, Shi‘i tribesmen and clerics spread their influence and undermined the political and moral authority of the Ottoman Empire. Above all, the overarching theme of the story told herein reveals that efforts to simplify and control a complex ecosystem often carry unintended consequences, not just in the biophysical realms, but in cultural and political ones as well.

More than a study of the Tigris and Euphrates alone, this dissertation has offered a new interpretation of the history of the Ottoman eastern provinces, focusing on the kinship between them, a relationship forged not by blood and marriage, but by water. Süleyman I’s political unification of the twin rivers brought imperial agents into contact with different settlements,
ecologies, and forms of life that congregated around the same river system for their survival and growth. From its dominant position over a unified drainage basin, Istanbul relied on the kinetic energy of air and water flows to reorganize elements of the ecosystem and establish a new order that best suited its imperial project in the east. As a result, farmers harvested the grain fields of Nusaybin and Mardin to feed the janissary corps of Baghdad in the south; loggers selectively chopped down the pine groves of Malatya and Maraş for the sake of Birecik and Basra, where galleys armed with guns could be assembled; mobile pastoralists in the vicinity of Aleppo sacrificed their sheep and goats to supply the raft makers of Diyarbakır and Mosul with watertight animal skins.

The Ottoman administration used its leverage, moreover, to promote the most lucrative species in the ecosystem. It did so by supporting and allying with the cultivators of four crops (rice, barley, wheat, and date palm) and the herders of four animals (sheep, goats, water buffalo, and cattle) in the alluvial plain. For crop production, imperial support involved tax breaks for land reclamation projects and inputs of labor that assisted in the excavation and clearing of canals and in repairing dams and breaches in riverbanks. More importantly, it involved maintaining law and order and providing maximum security against pastoral raids. In the arena of animal rearing, the Ottoman administration modified the existing social structure of pastoral society and reorganized a considerable portion of it into herders’ associations, the largest of which were the Ahşamat shepherds and the Cemmasat buffalo herders. The policy allowed imperial agents to monitor and regulate an otherwise intractable segment of the population and to capture its substantial wealth more efficiently. It was these imperial efforts to rebalance resources and promote some over others within the Tigris-Euphrates system that made Ottoman rule between the Taurus Mountains and Persian Gulf possible.
Taking cognizance of the myriad opportunities and risks the Tigris and Euphrates presented to societies of the early modern Middle East has significant historiographical implications. Among other things, it suggests that the Ottoman Empire could not persist as long as it did in an ecological vacuum. In West Asia, its political power was embedded in the circulation of water within the Tigris-Euphrates system, which gave coherence and force to its institutions. The centrality of the hydrologic cycle to Istanbul’s authority overseas explains why Ottoman power came to a sudden halt following the interruption of flow within the Euphrates. The history of the twin rivers, in addition, highlights that evaluations of environmental growth and decline in the Middle East cannot be based solely on the expansion and retraction of arable lands. Instead, scholarly analyses should take into account far more and no less important services the Tigris and Euphrates provided for communication, policing, political integration, and productive activities other than arable farming, such as animal rearing and wetland exploitation; studies should consider the limitations the rivers imposed on all these areas as well. From this perspective, the sixteenth century marks the dawn of a new period in the history of the Tigris and Euphrates, when Ottoman integration allowed the potential of both rivers to be realized more fully than was possible in the previous 500 years.

The Ottoman order in the Tigris-Euphrates basin gradually gave way to a new one in the nineteenth century. In the process, field cannon cast in the foundries of Istanbul, pinewood galleys assembled in the Birecik Shipyard, and janissary corps manning the Baghdad and Basra fortresses succumbed to the allure of English mortars and shells, Belgian iron steamers, and bombardiers and gunners trained in the European arts of war.\textsuperscript{736} The Ottoman vision of modernity sought to reshape

the diverse ecology of the alluvial plain into a more homogenous one; one that was drier, permanently settled, and intensively cultivated. Pastoral tribes that once formed the backbone of the imperial economy in the region were now cast as squanderers of Ottoman wealth and as impediments to the state’s attempt to join European powers within the ranks of civilized nations.\footnote{Selim Deringil, “‘They Live in a State of Nomadism and Savagery’: The Late Ottoman Empire and the Post-Colonial Debate,” \textit{Comparative Studies in Society and History} 45, no. 2 (2003): 311-342; Ceylan, \textit{The Ottoman Origins of Modern Iraq}, 132-152.}

The nation-state system introduced by Britain and France in the aftermath of World War I marked a more dramatic transition in the history of the region. Scholars and politicians often criticize the modern political landscape for its incongruence with the Middle East’s ethnic and sectarian makeup. Geographically, the new map was no less arbitrary, dismembering the Tigris and Euphrates and dividing the pieces among the nation states of Turkey, Syria, and Iraq. Haphazard water storage facilities and irrigation projects sprouting up in each country have added unprecedented environmental stresses that have taken a heavy toll on the availability and quality of river water. As a result, at least forty percent of the Euphrates’ flow downstream has been lost since 1972, a trend expected to continue apace if current conditions remain unchanged.\footnote{M. Nouar Shamout and Glada Lahn, \textit{The Euphrates in Crisis: Channels of Cooperation for a Threatened River} (London: Chatham House, 2015); Peter Beaumont, “Restructuring of Water Usage in the Tigris-Euphrates Basin: The Impact of Modern Water Management Policies,” in \textit{Transformations of Middle Eastern Natural Environments: Legacies and Lessons}, ed. Jeff Albert, Magnus Bernhardsson, and Roger Kenna (New Haven: Yale School of Forestry and Environmental Studies, 1998), 168-186; Campbell Robertson, “Iraq, a Land between 2 Rivers, Suffers as One of Them Dwindles,” \textit{New York Times}, July 14, 2009, A1.} The early modern experience of the twin rivers under Ottoman rule, therefore, is instructive: coordination in the management of river systems can unlock promising opportunities for communication and bring about a more efficient and sustainable use of water resources.
Appendix A: Table Citations

**TABLE 1**


**TABLE 2**

*Note:* Figures denote people living within fortress walls. The keyword in Ottoman bureaucratic jargon for these figures is “nefs”—self. For instance, the population of “nefs-i Amid” (Amid itself) in the registers refers to those living within the walls of the Amid Fortress.


**TABLE 3**


**TABLE 4**

*Note:* The figures from 1552 and 1590 are not very comparable due to the debasement of the akçe around 1585.

*Sources:* BOA, TT 282, pp. 15, 21, 25; TKG.KK, TT 30, ff. 193a, 203a.

**TABLE 5**

*Sources:* 1565: BOA, MAD 2775, p. 694 (6 C 973/29 December 1565). 1566: BOA, MAD 2775, p. 1391 (3 L 973/23 April 1566); BOA, MD 5, no. 1028, p. 388 (28 B 973/19 February 1566). 1567: BOA, MD 7, no. 305, p. 117 (7 R 975/10 October 1567). 1579: BOA, MD 32, no. 519, p. 284 (27 ZA 986/25 January 1579); BOA, MD 32, no. 631, p. 348 (17 M 987/16 March 1579); BOA, MD 38, no. 72, p. 19 (1 S 987/30 March 1579); BOA, MD 38, no. 263, p. 131 (15 RA 987/12 May 1579); BOA, MD 38, no. 308, p. 155 (12 Z 987/30 January 1580). 1639: BOA, MAD 46 (1049/1639-1640). 1699: BOA, MAD 9885, p. 180 (15 CA 1111/7 November 1699). 1700:
TABLE 6

### TABLE 7


### TABLE 8

**Note:** On the number of low-ranking military men (mustahfizan, gönüllüyan, azaban, and others) stationed in Basra in 1555 and 1600, see Salih Özbäràn, *Ottoman Expansion toward the Indian Ocean in the 16th Century* (İstanbul: Istanbul Bilgi University Press, 2009), 226-232, 242-251.

TABLE 9


TABLE 10

### TABLE 11


**Sources:** 1552: “Hükümmâne Mecmuası,” TSMK, Koğuşlar MSS 888, fol. 472a (26 L 959/15 October 1552). 1565: BOA, MD 6, no. 1013, p. 468; BOA, MD 5, no. 393, p. 164 (26 RA 973/21 October 1565); BOA, MD 5, no. 689, p. 269 (1 C 973/24 December 1565); BOA, MD 5, no. 1014, no. 381 (28 B 973/19 February 1566). 1570-1571: BOA, MD 9, no. 229, p. 88 (27 L 977/3 April 1570); BOA, MD 12, no. 92, p. 45 (25 N 978/20 February 1571); BOA, MD 12, no. 432, p. 204 (18 ZA 978/13 April 1571); BOA, MD 12, no. 846, p. 436 (28 B 977/18 August 1571). 1572-1573: BOA, MD 19, no. 357, p. 356 (28 S 980/9 July 1572); BOA, MD 19, no. 401, p. 194 (29 S 980/10 July 1572); BOA, MD 21, no. 39, p. 8 (10 N 980/14 January 1573); BOA, MD 23, no. 425, p. 201 (7 § 981/2 December 1573). 1574: BOA, MD 24, no. 31, p. 12 (16 ZA 981/9 March 1574); BOA, MD 24, no. 77, p. 26 (22 ZA 981/15 March 1574); BOA, MD 26, no. 16, p. 5 (19 S 982/10 June 1574). 1577: BOA, MD 30, no. 450, p. 191 (20 S 985/9 May 1577); BOA, MD 30, no. 451, p. 191 (18 S 985/7 May 1577). 1583: BOA, MD 44, no. 223, p. 124 (991/1583). 1613: BOA, MD 80, no. 554, p. 220 (7 R 1022/27 March 1613).

### TABLE 12


### TABLE 13


### TABLE 14

**Sources:** 1552: “Hükümmâne Mecmuası,” TSMK, Koğuşlar MSS 888, fol. 344a (9 § 959/31 July 1552), fol. 344b (10 § 959/1 August 1552), fol. 345b (19 § 959/20 August 1552); Ali Yılmaz, “XVI. Yüzyılda Birecik Sancağı” (Ph.D. diss., İstanbul Üniversitesi, 1996), 168-169. 1565-1567: BOA, MD 5, no. 353, p. 150 (10 RA 973/14 October 1565), no. 821, p. 315 (28 C 973/20 January 1566); BOA, MAD 2775, pp. 112, 116, 171, 179, 324 (17 M-29 S 973/14 August-24 September 1565). 1571: BOA, MD 10, no. 421, p. 270 (28 B 979/16 December 1571); BOA, MD 16, no. 301, p. 152 (28 B 979/16 December 1571); BOA, KK 79, p. 252 (11 R 979/2 September 1571); Yılmaz, “Birecik Sancağı,” 175. 1575: BOA, MD 27, no. 203, p. 82 (9 § 983/13 November 1575), no. 436, p. 191 (9 § 983/11 January 1576), no. 450, p. 197 (14 § 983/16 January 1576), no. 465, p. 202 (15 § 983/17 January 1576), no. 748, p. 315 (6 Z 983/7 March 1576). 1629: Katib Çelebi, *Fezleke-i...
Katib Çelebi (Istanbul: Ceride-i Havâdis Matbaası, 1286/1869), 2:115-116, 1637-1638: BOA, MD 87, no. 437, p. 134 (1 B 1047/19 November 1637), no. 464-465, pp. 143-144 (3 Ş 1047/21 December 1637), no. 474, p. 147 (18 N 1047/3 February 1638). 1699-1701: BOA, MAD 4879, p. 118 (29 Z 1110/27 June 1699); BOA, MAD 7915, pp. 268, 272-275, 375-376, 392 (2 R 1111-1 Ramazan 1112/26 September 1699-18 February 1701); BOA, D.BSM.TRE 14598, p. 8 (16 R 1112/29 September 1700); BOA, MAD 5433 (6 N 1112/14 February 1701). 1703: BOA, MAD 7915, pp. 416-418 (22 S 1115/7 July 1703); BOA, AE.SMST.II 2/171 (22 S 1115/7 July 1703). 1706: BOA, MAD 7915, p. 326-328 (4 L 1117-18 C 1118/19 January-26 September 1706); BOA, AE.SAMD.III 210/20291 (7 L 1117/22 January 1706); BOA, AE.SAMD.III 4/277 (21 CA 1118/20 October 1706). 1709: BOA, MAD 7915, pp. 334-341 (2 Z 1120/12 February 1709); BOA, MAD 7915, pp. 334-341 (2 Z 1120/12 February 1709); BOA, MAD 7915, p. 344 (24 S 1123/13 April 1711); BOA, C.BH 50/2377 (5 Z 1120/15 February 1709). 1719-1720: BOA, MAD 7915, pp. 358-361 (9 B 1131/29 May 1719); BOA, MAD 7915, p. 359 (22 N 1132/28 July 1720). 1728: BOA, MAD 7915, pp. 346-347 (20 C 1140/1 February 1728). 1730: BOA, MAD 7915, p. 350 (8 CA 1143/4 October 1730). 1734-1735: BOA, D.BSM.TRE 14694 (Evahir Z 1146/25 May-4 June 1734); BOA, MAD 9934, pp. 95, 167-168, 197, 246, 262 (25 N 1146/1 March 1734), pp. 173-174, 177-178, 309 (9 L 1146/15 March 1734); BOA, C.AS 922/39875 (Evahir Z 1146/25 May-4 June 1734); BOA, C.BH 193/9048 (18 Z 1147/11 May 1735); BOA, C.AS 1104/48809 (22 CA 1147/20 October 1734); BOA, C.BH 85/4078 (15 Ş 1147/10 January 1735); BOA, C.BH 193/9047 (18 CA 1147/16 October 1734). 1743-1746: BOA, C.BH 222/10313 (26 RA 1156/20 May 1743); BOA, MAD 9947, p. 134 (3 R 1156/27 May 1743), p. 375 (15 N 1156/2 November 1743); BOA, MAD 9948, p. 14 (14 S 1157/29 March 1744); BOA, MAD 9952, p. 237 (12 N 1157/18 October 1744); BOA, C.BH 238/11063 (12 N 1157/19 October 1744); BOA, AE.SMHD.I 181/14113 (2 C 1157/13 July 1744); BOA, AE.SMHD.I 129/9464 (23 CA 1157/4 July 1744); BOA, D.BSM 2855 (1158-1159/1745-1746); BOA, D.BSM.TRE 14800 (9 R 1158/11 May 1745); BOA, C.AS 709/27945 (10 R 1158/12 May 1745); BOA, AE.SMHD.I 233/18716 (9 RA1158/11 April 1745); BOA, HAT 7/223 (11 CA 1159/1 June 1746). 1777: BOA, HAT 6/212 (23 R 1191/31 May 1777); BOA, HAT 7/217 (23 R 1191/31 May 1777); BOA, MAD 10017, pp. 38-39 (19 S 1191/29 March 1777), p. 89 (10 RA 1191/18 April 1777), p. 94 (12 RA 1191/20 April 1777), pp. 203-205, 212-213 (29 R 1191/6 June 1777); BOA, C.AS 630/26610 (19 R 1191/27 May 1777); BOA, C.BH 258/11954 (18 N 1191/20 October 1777); BOA, C.AS 1041/45700 (12 RA 1191/20 April 1777).

**TABLE 15**

**Note:** This table pertains to documents that provide detailed information about the size of the Shatt fleet and its crew. For construction and renovation activities, see Table 14.


**TABLE 16**


**TABLE 17**

**Sources:** 1552: BOA, TT 282, pp. 42-72. 1590: TKG.KK, TT 30, ff. 15b-32b.

**TABLE 18**


**TABLE 19**

**Sources:** 1699-1700: BOA, C.BH 149/7106 (16 R 1111/11 October 1699); BOA, MAD 7915, p. 276 (15 R 1111/9 October 1699); BOA, MAD 7915, p. 278 (1111/1699-1700); BOA, MAD 7915, p. 369 (28 B 1111/19 January 1700); BOA, MAD 7915, p. 375 (10 Ş 1111/31 January

**TABLE 20**


**TABLE 21**


**TABLE 22**

**Sources:** 1700-1701: BOA, MAD 7915, p. 398 (9 B 1113/9 December 1701); BOA, MAD 7915, p. 378 (2 N 1111/21 February 1700); BOA, MAD 975, p. 15 (28 Safar 1112/14 August 1700). 1744: BOA, MAD 9948, p. 14 (14 S 1157/29 March 1744); BOA, MAD 9948, p. 15 (2 C 1157/12 July 1744).

**TABLE 23**

**Sources:** TKG.KK, TT 29; TKG.KK, TT 30.

**TABLE 24**

**Sources:** 1552: BOA, TT 282. 1590: TKG.KK, TT 30.

**TABLE 25**

**Sources:** 1552: BOA, TT 282. 1590: TKG.KK, TT 30.

**TABLE 26**

**Note:** The figures from Baghdad date to around 1580, while Basra’s figures date to around 1590. **Sources:** TKG.KK, TT 29; TKG.KK, TT 30.
TABLE 27

Sources: 1540: BOA, TT 1028, p. 54. 1544: TKG.KK, TT 228, ff. 3a-4a. 1580: TKG.KK, TT 29, ff. 119b-140b.

TABLE 28

Source: TKG.KK, TT 29.

TABLE 29

Source: TKG.KK, TT 30.

TABLE 30


TABLE 31

Source: TKG.KK, TT 29.

TABLE 32

Source: TKG.KK, TT 30.

TABLE 33

Sources: TKG.KK, TT 29; TKG.KK, TT 30.

TABLE 34


TABLE 35


TABLE 36

Sources: 1544: TKG.KK, TT 228, fol. 45a. 1670: BOA, D.ẞM.BGH 1/17.
TABLE 37


TABLE 38

Sources: TKG.KK, TT 29; TKG.KK, TT 30.

TABLE 39

Sources: 1540: BOA, TT 1028, 91; 1544: BOA, TT 228, 45a-46a; 1580: TKG.KK, TT 29, 201b-215b.

TABLE 40

Source: TKG.KK, TT 29.

TABLE 41

Source: TKG.KK, TT 30.

TABLE 42

Source: TKG.KK, TT 29.

TABLE 43

Source: TKG.KK, TT 30.

TABLE 44


TABLE 45

Source: TKG.KK, TT 29.

TABLE 46

Source: TKG.KK, TT 29, 49b-110a, 304a-468a.

TABLE 47

Sources: TKG.KK, TT 29, 332b-333b. See also BOA, TT 1073, 18.
Appendix B: Staffing Religious Institutions

Appointments made in Amid: BOA, AE.SAMD.III 126/12348 (10 R 1118/21 July 1706); BOA, AE.SAMD.III 115/1119 (5 R 1119/5 July 1707); BOA, AE.SAMD.III 186/18038 (13 N 1121/15 November 1709); BOA, AE.SAMD.III 161/15809 (22 B 1124/25 August 1712); BOA, AE.SAMD.III 32/3048 (29 C 1124/2 August 1712); BOA, AE.SMST.I 281/24887 (21 CA 1175/18 December 1761); BOA, AE.SABH.I 281/18900 (19 L 1199/24 August 1758).

Appointments made in Mosul: BOA, MAD 2775, p. 391 (7 RA 973/2 October 1565); BOA, AE.SAMD.I 115/1119 (5 R 1119/5 July 1707); BOA, AE.SMMD.IV 100/11727 (1058-1099/1648-1687); BOA, AE.SAMD.II 21/2252 (12 M 1103/4 October 1691); BOA, AE.SAMD.II 21/2244 (15 S 1103/6 November 1691); BOA, AE.SMST.II 16/1567 (Evahir M 1107/31 August-8 September 1695); BOA, AE.SAMD.III 28/2710 (16 R 1119/16 July 1707); BOA, AE.SAMD.III 69/6921 (10 Z 1119/3 March 1708); BOA, AE.SAMD.III 43/4218 (Evail B 1122/26 August-4 September 1710); BOA, AE.SAMD.III 23/2146 (25 RA 1124/1 May 1712); BOA, AE.SAMD.III 85/8567 (8 C 1124/12 July 1712); BOA, AE.SAMD.III 58/5791 (17 Z 1140/25 July 1728); BOA, AE.SAMD.III 218/21002 (16 Z 1141/13 July 1729); BOA, D.BŞM.MSH 8/19 (23 S 1159/16 March 1746); BOA, AE.SOSM.III 86/6647 (4 R 1168/18 December 1754); BOA, D.BŞM 3383 (1169-1173/1755-1760); BOA, AE.SOSM.III 69/5223 (22 C 1171/3 March 1758); BOA, C.EV 122/6078 (9 Ş 1180/10 January 1767); BOA, AE.SABH.I 230/15255 (7 M 1190/27 February 1776); BOA, AE.SABH.I 325/22165 (5 R 1191/13 May 1777); BOA, AE.SABH.I 325/22164 (5 R 1191/13 May 1777); BOA, AE.SABH.I 92/6294 (9 L 1198/25 August 1784); BOA, AE.SSLM.III 84/5094 (8 Ş 1216/14 December 1801); BOA, C.MF 169/8420 (16 ZA 1222/14 January 1808).

Appointments made in Baghdad: “Hükümmame Mecmuası,” TSMK, Koğuşlar MSS 888, fol. 347b (22 Ş 959/13 August 1552); BOA, MAD 2737, p. 198 (23 Z 1062/25 November 1652); BOA, AE.SMMD.IV 23/2579 (24 R 1087/6 July 1676); BOA, AE.SMMD.IV 3/313 (8 C
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Bab-ı Defteri Başmuhasebe Diyarbakır Hazinesi (D.BŞM.DBH)

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