

OUTPOST OF EMPIRE: AN APPRAISAL OF OTTOMAN BUILDING REGISTERS AS SOURCES FOR THE ARCHEOLOGY AND CONSTRUCTION HISTORY OF THE BLACK SEA FORTRESS OF ÖZİ

DEDICATED TO THE MEMORY OF NEJAT GÖYÜNÇ

In this study we aim to explore the utility as sources for the building history and archeology of the Özi fortress complex of a little-used corpus of Ottoman archival materials from the late seventeenth and eighteenth centuries, which we provisionally refer to as “new-style building registers.” We sample the earliest period for which such registers are extant for Özi as a test case for their wider applicability and as a starting point for a more thorough building history of this complex. In addition, we begin to assess the potential of these materials for the study of Ottoman building technology and terminology.

HISTORICAL SETTING

Before embarking on our evaluation of the “new-style building registers,” we offer an overview of the historical context in which successive stages of the fortification of the site of Özi took place. The once-formidable complex of castles and, eventually, fortresses¹ at Özi (Ukrainian: Ochakiv; also Polish: Oczaków; Russian: Ochakov) in present-day Ukraine was for two centuries of its three-century-long existence a massive and vital link in a chain of strongholds guarding the Ottoman frontier against the incursions of hostile neighbors around the northern rim of the Black Sea and beyond—from the Danube to the Sea of Azov and into the Caucasus (fig. 1). From west to east the most significant castles/fortresses in this chain were: İbra’ıl (Brăila), İsaqçı (Isaccea), İsmā’ıl (Izmajil), Tulça (Tulcea), and Kili (Kilija) in or near the Danube delta; Bender (Bendery) on the Dniester and Aqkerman (Bilhorod-Dnistrovs'kyj) at the river mouth; Özi on the Dnieper; Or (Perekop) at the isthmus of the Crimean peninsula and Kefe (Feodosija) on the south Crimean coast; Kerş (Kerch) at the mouth of the Sea of Azov, Yeniqa’le (Jenikale, today within the northeastern city limits of Kerch) on the eastern salient of the Crimean peninsula, and Taman across

the straits through which the Sea of Azov debouches into the Black Sea; and, finally, Azaq (Azov) where the Don River debouches into the Sea of Azov. Aside from acting to maintain local order and safety on the northern steppe frontier, in the sixteenth and seventeenth centuries the strongholds defended the Ottoman Black Sea and its shores from the depredations of the Cossacks and potential attack from their then generally less aggressive suzerains—Poland-Lithuania to the northwest and Muscovy to the northeast; finally, in the eighteenth century, they stood against the ever more southward-expanding Russian Empire. The Danubian castles/fortresses to the west of the river delta, such as Vidin and Belgrade, constituted the defense line against the Habsburg Empire, while important sites far up the great rivers of the Black Sea basin, such as Hotin (Khotyn) on the Dniester and Yaşı (Iaşi) on a tributary of the Prut, and others such as Anapa on the Black Sea coast to the southwest of Taman, also at times played a crucial part in the defense of the Ottoman realm. From the sixteenth century until their final loss to the armies of Catherine the Great after the war of 1787–92 and the Treaty of Yaşı that concluded it, these fortifications were the man-made expression of a frontier on which the Ottoman heartland was already protected in some degree by sea and steppe.

Fortifications are one of the most enduring signs of empire. The northern Black Sea strongholds are today in various states of preservation, but of the fortress complex at Özi little remains. Looking out from the shore, the visitor is overwhelmed by the watery expanses of the wide Dnieper estuary and the Black Sea (fig. 2); behind and high above, the vast steppe that extends to the north towers on sandstone bluffs. Hot in summer, the climate in winter could be so frigid that the locals described it, according to the Ottoman traveler Evliya Çelebi, who visited the area in 1657, as “a hellish cold” (*soğuş-i cehennem*). Evliya claimed that



Fig. 1. The Black Sea Region in the early eighteenth century.

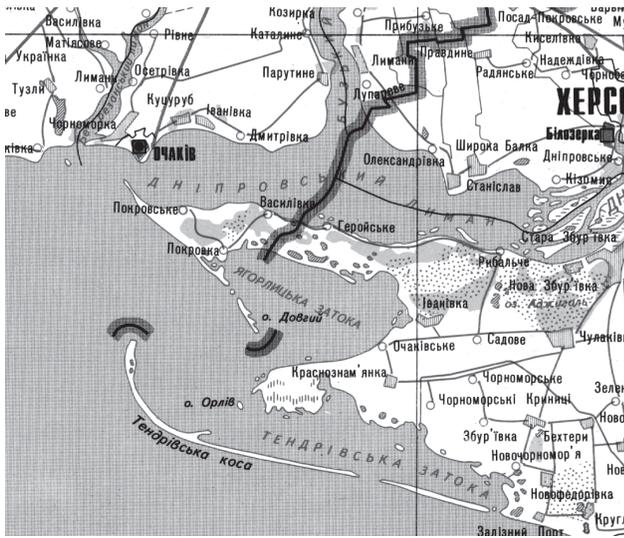


Fig. 2a. The Dnieper River estuary. (Fragment from *Ukrainina*. Ohljadova mapa. 1:1,000,000 [Kiev: Mapa, 1998])



Fig. 2b. The Dnieper River mouth. (Satellite image taken by EarthSat, printed courtesy of TerraServer.com)

the cold prevented vegetables and any fruit apart from melons from growing there and added that “no tree stands upright in these desert lands”; this last gave rise to a saying among the people, “I will destroy you in the Özi steppe” (*Seni Özü qırında yitireyim*).²

In the first half-century after their capture of Constantinople in 1453, the Ottomans were swift in moving to gain control of the Black Sea and its Anatolian and Rumelian shores. On the northern frontier, from the Danube to the Caucasus, the key castles they captured or built at the junction of sea, steppe, and often river, along with their control of polities subject to their suzerainty—Moldavia, and especially the Tatar and Muslim Crimean Khanate—allowed them to maintain a high degree of security in the immediate Black Sea region, what could then be properly referred to as an “Ottoman Lake.” The chain of fortifications rimming the Black Sea, in combination with control of the steppe provided by the Crimean Tatars, meant that until modern times there was little threat of either power to the north mounting a serious challenge to Ottoman dominion over the area. The rich natural resources and commercial potential of the Black Sea region—both land and water—provided Istanbul with a hinterland that played a major role in the strength and prosperity of the entire empire and fostered Ottoman ability to expand on other fronts.³

The first fortification at Özi was constructed in the 1490s by the Crimean Khan, Mengli Gerey, and its main purpose appears to have been to permit the Tatars to establish a foothold on the right (west) bank of the Dnieper River, land that had been subject to the Grand Duchy of Lithuania, in the early fifteenth century still holder of a large swath of territory between the Baltic and Black seas. Then known to the Tatars and Ottomans as Cankerman, it gained additional strategic importance by its usefulness for guarding and controlling the long and deep crossing of the mouth of the Dnieper, used by merchants and diplomats alike, and especially by Tatar armies and raiding parties on the way to the steppes of Aqkerman and to Moldavia, Podolia, and beyond. The building history of Özi during the first two centuries of its existence (especially the late fifteenth and sixteenth centuries) is still murky and will be addressed by us on another occasion. It seems that through most of the sixteenth century, however, it was a lone isolated castle atop the bluff overlooking the right bank of the Dnieper just upriver from its confluence with the sea. In 1528 the Ottomans took Cankerman over from the Crimean Khanate, eventually making it the seat of an epony-

mous province (*sancaq*) also referred to as Özi. It was then that Ukrainian Cossacks and other subjects of the Commonwealth increased raiding activity both by land and water in the vicinity. Interlopers were nevertheless a nuisance of only local importance until the second half of the century, when the Cossacks gradually extended their range, developing a formidable naval capability thanks to their maneuverable but seeworthy longboats known as *chajkas* (Ott. *şayqa*). With these the Ukrainian (mostly the Zaporozhian)⁴ Cossacks raided with greater and greater regularity and ferocity, first the northern shores of the Black Sea, then Rumelia, and eventually, from the 1610s onward, Anatolia and even the Bosphorus. From the direction of the Sea of Azov came Russian Don Cossacks who often cooperated with the Zaporozhians. No Ottoman cities, towns, or villages on or near the Black Sea were immune to sudden Cossack strikes and devastation. Özi became second to none as the most strategic node of Ottoman defense against the Ukrainian Cossacks and needed to be expanded and strengthened, not only to help guard the mouth of the Dnieper and interdict Cossack passage through the wide “Özi Mouth” or even the “Özi Straits” (*Özi Boğazı*, as Ottoman sources call it), but to protect itself from sudden sack.

By the end of the 1620s, with the construction of two castles added onto the original castle (which, it seems, had itself been upgraded since it was first built), all adjoining one another in a line, the fortifications of Özi reached all the way down to the Dnieper shore. Added first was a castle at the riverside, intended to withstand Cossack naval assault and to fire cannons at passing *chajkas*; this was called the New Castle (*Qalʿe-i Cedid*), while the original bluff-top castle became known as the Old Castle (*Qalʿe-i ʿAtiq*). In 1627–28, Hasan Pasha, Grand Admiral of the Ottoman fleet, built a small palanka⁵ connecting the Old and the New castles, named the New Palanka or New Palanka of Hasan Pasha (*Palanqa-i Cedid, Palanqa-i Hasan Paşa*). We will refer to the Old Castle as the Upper Castle, the New Palanka as the Middle Castle, and the New Castle as the Lower Castle; these three connected castles amounted to one large structure, which we will refer to as the Main Castle of the Özi complex (shown in the innermost part of the plan in fig. 3). In the same decade Hasan Pasha built a small satellite castle known as the Fort of Hasan Pasha (*Qalʿe-i Hasan Paşa*) downriver from the Main Castle, closer still to the point where the Dnieper enters the Black Sea but, more important, at a site closest to Qılburun (“Hair

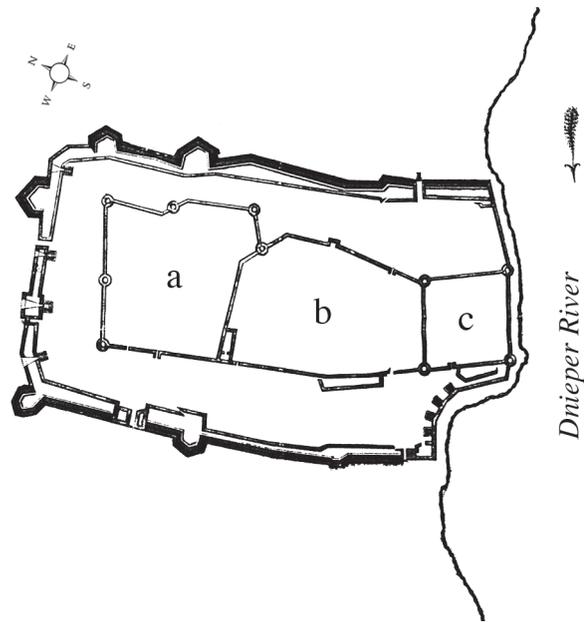


Fig. 3. Outline of the Özi Main Fortress showing the walls of the (a) Upper, (b) Middle, and (c) Lower castles completed by the mid-seventeenth century, and the ramparts built around them in the 1710s. (Based on BOA, Plan ve Proje, 857 [fig. 6])

Spit,” today Kinburns'ka Kosa, directly across the river-mouth—see figs. 1 and 2) where, with another existing fort—which Hasan Pasha was at least involved in repairing or upgrading—the Ottomans hoped to hinder Cossack passage by cannon shot.⁶

Within the modern town of Ochakiv, there is virtually nothing of these fortifications today other than a few remnants of earth-covered ramparts (the rampart is the main body of a fortress, comprising bastions and the walls, or curtains, connecting them; see figs. 4 and 5) that may be seen here and there. The best-preserved section lies in the vicinity of the Ochakiv Military-Historical Museum, originally an eighteenth-century Ottoman mosque; even closer to the museum a section of a ditch is also evident.⁷ Another discernible feature is a network of cavities within the town and under both built and unbuilt areas: these have been revealed in many places where the ground has collapsed, at times even swallowing buildings into them. The exact function of these cavities is not clear without further investigation, but they may have been mining tunnels or galleries for communication.

Owing to a number of factors, such as vagaries of archival access, lack of funding, and predisposition

on the part of historians or archeologists to study the antiquity of this region rather than the Turco-Tatar period, the fortresses of the northern Black Sea have not yet been the object of study as an integrated defense system in the context of their own time; moreover, to our knowledge none has been surveyed using modern techniques.

For most of its existence the northern Black Sea frontier was a defensive line par excellence. It provided a contrast with the Ottoman frontier with the Habsburgs: in the Balkans and Hungary, it was the Habsburgs who were thrown on the defensive for the century and a half from the 1520s; on the northern Black Sea, from the late sixteenth century, it was the Ottomans. The character of military activity was rather different in the two regions: in the Balkans and Hungary, the Ottomans were matched by armies employing broadly similar weapons and tactics—as they were in the northern Black Sea region during their struggle with the armies of the Russian Empire in the eighteenth century—but before this, the asymmetric, and formidable, character of the forces of their Cossack foe was disconcerting in the extreme and, what was worse, often proved difficult to answer. Although, as in the Balkans, many of what subsequently became highly fortified Ottoman strongholds rested on foundations that predated the confrontation between them and their neighbors to west and north, the Ottomans were aware that the Black Sea steppe was not a region they either needed or wanted to occupy. Accordingly, they established their defensive line on this frontier with circumspection, enhancing existing castles and raising new ones where they deemed them essential, and responding to signs of trouble from the north rather than actively seeking military adventure in the sparsely peopled and alien zones where they reckoned establishing a permanent presence to be beyond their capacity or not worth the effort.⁸

THE NEW-STYLE OTTOMAN BUILDING REGISTERS

The Ottoman archives in Istanbul⁹ preserve a corpus of materials relating to the building and repair of infrastructure such as roads, bridges, and fortresses. The documentation that must be relied upon to piece together the early construction and reconstruction of these structures is far from consistent. Following a period of bureaucratic reorganization from the late seventeenth century, the progress of such works from

inception to completion was recorded in dedicated registers of the Central Financial Department (*Mâlîyye*). Prior to the appearance of these registers, explicit information on construction was haphazardly distributed in the documentation, in single-sheet documents such as reports and orders, whose main purpose was organizational, as well as in registers aimed primarily at controlling finances, specifically designation and disbursement of monies. Financial oversight was often exercised by means of expenditure books (*maşraf defterleri*) and account books (*muhāsebe defterleri*). While their itemization of costs (construction materials and/or labor types) makes these valuable sources on construction, they typically give little or no explicit, descriptive information about circumstances relating to the activity that was being financed.¹⁰ In contrast to the “static” lists of data in these sources, the new-style registers are replete with descriptive information relating to construction activity. They are given various qualifiers in the archival catalogues—*inşā’āt* (“construction”), *ta’mirāt* (“repairs”), *keşf* (“appraisal”), *keşf ve ta’mirāt* (“appraisal and repairs”)—but there is no evidence of any well-defined criteria having determined cataloguers’ preference for one designation over another. (Only some of the registers contain a formal title page; in such cases the above appellations are the most common.)

Lack of rigor is not the only or even the main reason for the variety of labels assigned by archivists to these sources. As these voluminous and complicated *defters* vary in content and structure, and tend to defy rigorous classification, their origin, function, and diplomatics remain in need of systematic investigation.¹¹ Nonetheless, it is possible to propose the following working definition (or perhaps working description) of the new-style registers: while their contents may include sections that differ little from the quantitative lists of the prior era, predominant in them is a composition involving, in any given section, (1) headings; (2) copies or summaries of petitions, reports, memoranda, and orders; and often (3) quantitative entries indicating, with various degrees of specificity, the amounts and costs of the material and human aggregates of a construction project. Almost invariably these three elements are arranged in a broad column occupying the main body of the page, with an additional narrow column of text on the outside margin of the page and often with patches of text above and below the main column. Element 2 typically comprises the major part of these compositions, while element

3 is found in the margins less frequently than in the main body.¹² The new-style registers provide in intricate detail information on such matters as the location and dimensions of works to be undertaken and damage to be repaired; the stages and forms of construction or reconstruction works; the amount, sources, and costs of the materials to be used in the works; the sources and costs of transportation of these materials; the sources and costs of labor needed to carry out the works in question; and a step-by-step record of the administrative procedures involved in undertaking the works. At this stage, we eschew wrangling with the question of the degree to which the designations *inşāʾāt*, *taʿmīrāt*, and *kesf* applied to different categories of *defters*, and refer to the new-style *defters* as characterized herein simply as “building registers.”¹³ We note that after the bureaucratic reorganization that led to the production of these building registers, *defters* with predominantly quantitative data, of financial or inventory nature,¹⁴ continued to be produced in significant numbers.

Trying to understand the documents that were the everyday working medium of the Ottoman bureaucracy some hundreds of years after they were written is challenging. We must assume that the individuals involved—in the case of Özi, the fortress warden (*muḥāfiz*) and his officials and experts on the ground, and the supervisors and bureaucrats in Istanbul, of whom few can ever have been to the site—were able to understand one another, but what they wrote can be confusing to the modern reader. Although the descriptions of construction works deemed necessary or actually in progress at Özi are detailed, they often defy easy interpretation and frequently seem contradictory. This is in part due to our uncertainty about the terminology of military architecture used by Ottoman military engineers and bureaucrats, which did not necessarily correspond directly with that employed by their European counterparts—or even, perhaps, with the terminology employed elsewhere in the empire. A characteristic of the building registers, as of many types of Ottoman bureaucratic register, is that they are geographically undifferentiated: thus, within a few consecutive pages or even on one page the researcher may find reference to building works at fortresses—or indeed other structures—situated at opposite ends of the empire; the frequently rough chronology according to which the material is arranged also militates against easy comprehension of their contents and makes it hard to follow in the correct order the steps taken

in organizing and executing any particular phase of construction. Owing to the seemingly chaotic order in which the registers were bound and to the often—to the modern scholar—elliptical fashion in which specific locations of repairs are referred to, it is sometimes impossible to be certain that works were in fact carried out soon after they were recommended, or indeed carried out at all, except where internal evidence supplies us with clues as to what was done. Other classes of Ottoman registers and documents enhance and illuminate the information found in the building registers, however, and we are thereby afforded a more comprehensive record of the tenacious Ottoman response to intense Russian attack on the northern Black Sea frontier, and a unique opportunity to study its fortresses through the various stages of their development. Until Özi became the focus of Russian attention during the early eighteenth century, there is little documentation in languages other than Ottoman concerning this remote site. For the rest of the eighteenth century, however, our preliminary investigations indicate that pictorial sources (plans and drawings of the fortresses) and both documentary and narrative sources (including descriptions such as an enemy power would have been at pains to procure) in Russian, French, and German (the last two the languages of the Russian officer class in the eighteenth century) will yield further essential data.

An early attempt to describe archival sources pertaining to the history of Ottoman architecture was made in 1951–52 by Muzaffer Erdoğan, who gave brief summaries of the contents of a number of the building and other construction-related registers.¹⁵ This documentation has since provoked rather little interest, and considerations of its possible worth in telling the story of the Ottoman Black Sea rim—or of any other system of Ottoman frontier fortresses—has barely been acknowledged in the literature. An exception to the general neglect of this material for the history of the fortresses of the northern Black Sea is Nejat Göyünç’s brief study of the recruitment of labor and the procurement of materials for the construction of the stronghold of Acu (Achuevo), on the eastern shore of the Sea of Azov, north of the mouth of the Kuban River, in 1697, following the capture of Azaq by Peter the Great the previous year.¹⁶

The new-style building registers are an important *raison d’être* for this study. To expand on the objectives stated in the preamble, in addition to furthering our knowledge of Ottoman military construction, and for that matter of architecture and frontier defense

infrastructure,¹⁷ we also hope to begin the process of establishing a glossary of the terms employed in Ottoman military architecture in order to facilitate comparison of the development of Ottoman fortresses with the better-studied fortresses of their foes to the west and north.^{18, 19} This is more ambitious than it sounds given the patchiness and often contradictory nature of the materials relating to the history of Özi before about 1700, the problems inherent in the building registers thereafter, and the paucity of attention given this type of register thus far. We therefore limit ourselves in this paper to an overview of the building history of the fortress complex for a limited period and for now leave aside questions of decision-making, organization of labor and materials, and their costs—topics on which, we stress, data in the building registers are no less abundant.

OTTOMAN MILITARY ARCHITECTURE AND OTTOMAN ARCHEOLOGY

As with any building, a good place to start research is on site: perhaps the most fascinating and productive implications of these archival materials lie in the realm of archeology. When we embarked on this project some years ago, we saw the wealth of archival information on Özi as a complement to the archeological work under the direction of Dr. Svitlana Biliaieva of the Institute of Archeology of the National Academy of Sciences of Ukraine, work then ongoing at various sites within the Özi fortress complex in the modern town of Ochakiv. When we visited in 1998 it became clear in discussions with Dr. Biliaieva and her team that the documentary material in Istanbul could help them to localize the structures they unearthed, and also suggest where they might dig in order to establish successive stages in the development of the Özi fortifications. Conversely, the small finds from the excavations would help us to better visualize life on this inhospitable and dangerous frontier.²⁰

Two projects within the borders of modern Turkey serve to illustrate the usefulness of documentary evidence in reconstructing the material past when invasive archeology is difficult owing to bureaucratic restrictions and financial or temporal limitations, or is unfeasible or undesirable for other reasons. The first of these projects concerns the mosque complex built in 1456 at Kırkkavak, near Üzüncöprü in Thrace, by the Ottoman conqueror of the Morea, the marcher-lord Gazi Turhan Beg,²¹ who together with his son ʿÖmer

Beg and his grandson Hasan Beg left an extraordinary legacy in stone—more than fifty-five structures built to serve the public weal, such as mosques, bathhouses and bridges—further west, in Thessaly. The existence of Gazi Turhan's foundation at Kırkkavak was known from its endowment deed (*vaqfiyye*) as well as from the land and population surveys (*tahrir defterleri*) of the area where it is located; only his tomb and mosque still stand to any height, however, and the site of further buildings of the complex was only revealed by an on-site electronic survey using a resistivity meter that exposed the precise position of a *medrese*, a *mekteb*, and an *ʿimāret* or *hān*. In addition, significant amounts of pottery fragments and other small finds were discovered by walking the survey area.

A second project is more ambitious. Survey of the paired Ottoman fortresses of Seddülbahir and Kumkale, which stand in ruins on either side of the mouth of the Dardanelles, was begun in 1997 and completed in 2002.²² These fortifications were built in 1657 by Turhan Sultan, mother of the ruling sultan Mehmed IV, to enhance Ottoman defenses against Venetian naval incursions during the Ottoman-Venetian war for possession of the Mediterranean island of Crete (1645–69). They continued to protect Istanbul from foreign naval attack as late as the First World War, when they were successfully used by the Ottoman military as part of the defense of their capital in the Gallipoli campaign of 1915. One of the purposes of the survey was to establish the building and repair chronology of the fortresses through detailed study of the existing remains in conjunction with documentary evidence. Analysis of both these types of evidence is enabling the research team to understand how the structures evolved over time to meet contemporary challenges such as improvements in military technology, and will also facilitate future preservation and restoration efforts.

The case of Özi is similar in intent to that of Seddülbahir and Kumkale, but the balance of the available evidence is somewhat different. As noted, virtually nothing remains above ground at Özi (though significant below-ground archeological finds are possible even if access to them is somewhat hampered by buildings of the present-day town of Ochakiv); by contrast with the Dardanelles fortresses, however, the archival record for Özi is many times more extensive. One reason for this is that the period of maximum building activity was later at Özi than at the Dardanelles—in the eighteenth rather than the seventeenth century—

which in itself allows for the survival of more documentation, not to mention the innovations in record-keeping mentioned above. A second reason is that the Ottoman struggle to defend the northern Black Sea frontier against the Russian Empire at that time was decidedly more intense than were efforts to defend the Dardanelles once the threat from Venetian naval activity—at its greatest during the Cretan war—had been countered. Indeed, what repairs and improvements to Turhan Sultan's fortresses did take place thereafter have been attributed by the survey team to the frequent earthquakes in the area rather than to enemy threat. The first appearance of the Russian fleet in the Aegean in 1770 apparently so surprised the Ottomans that they had no chance to undertake extensive upgrading of the fortresses, while subsequent French assistance seems to have brought little change in the form of the fortresses before the British-instigated efforts of the later nineteenth century. By contrast, that the Ottomans rebuilt Özi in anticipation of and after each Russian attack for almost a century illustrates the sustained effort required to protect their heartland from invasion from the north and their determination to maintain their dominion over the northern Black Sea region.

Lacking funding and opportunity, our potentially fruitful interdisciplinary cooperation with Dr. Biliaieva has so far not been realized. We came to understand, however, that although collaboration with archeologists was certainly a desideratum, reassessment of the documents demonstrated that these had the potential to reveal aspects of the building history of Özi that archeology could not. Where traditional archeology can permit retrieval of the ground plan of a built structure from which an elevation may be derived—or successive ground plans and elevations as chronological snapshots of the changing form of a structure—the Ottoman building registers can afford us a more nuanced understanding of exactly which parts of any structure were built or repaired at which precise date, and of the reasons for any specific phase of building activity and the problems encountered in carrying it out. Unlike the case of the Dardanelles, then, Ottoman archival materials, rather than archeological survey, provide the major resource for our hypothetical reconstruction of the layout and evolution of the Özi fortress complex: we might refer to this approach to recreating the past as “virtual archeology.”²³ In this connection, our sources provide data in the form of references to specific building materials (types of

stone, brick, wood, binding medium) as well as relative locations of constituent parts of the fortresses and their dimensions.

THE CONCEPTUAL DEBATE

Looking beyond the Ottoman archeological projects discussed above to the wider community of archeologists and historians—and, indeed, others such as anthropologists and specialists in art and architecture concerned with issues of material culture—we find vigorous argument in some quarters against the use of documents as a tool in archeology. For instance, some medieval archeologists fear that documentary evidence may predispose them to tailor their findings to a framework that is inappropriate and could result in poor interpretation of the evidence they retrieve. This, they argue, is particularly risky for the archeology of the medieval period when written evidence is meager and “history” largely a matter of conjecture and inference from the few available documents. Where there exist documents contemporary with the site being excavated or surveyed, the significance of what archeologists uncover is typically interpreted according to an agenda derived from “documentary” history rather than according to the established criteria of the discipline of archeology employed by those working in pre-documentary periods. This, some say, subverts their analysis and may produce results that are misleading and even erroneous. Practitioners of “document-based” history, they insist, should not assert the primacy of their evidence over that of archeologists—evidence that, once properly analyzed, offers an equally valid record of the past.²⁴

A new generation of archeologists heaps further criticism on their profession at large for the traditional emphasis on the lives of the rulers at the expense of the ruled, which has typically been exemplified in concentration on the architecture of the palaces and temples of past civilizations rather than on the less glamorous artifacts that enable us to understand the everyday life of “the people.” They propose that only by giving priority to the latter can “the silent masses speak”²⁵ and reprimand those who would persist in the old ways: this is the argument set out in a recent monograph on Islamic archeology,²⁶ a rubric that might be deemed to include Ottoman archeology.

Or not? Even as the use of documentary evidence together with, or as a substitute for, archeological evidence in understanding particular aspects of the Otto-

man period is taking shape, there is fierce controversy about the terminology to be employed in describing the endeavor itself, a debate that reflects varying perceptions of its legitimate concerns and purpose. In a recent paper on historical archeology, Uzi Baram takes issue with the view that Ottoman archeology is a particular instance of Islamic archeology, or indeed of Middle Eastern studies, arguing that Ottoman archeology must be situated within the wider purview of global historical archeology if the questions framed by the researcher are not to be constricted by the concerns of either Islamic or Middle Eastern studies, and are to be comparable to those asked of other archeologies elsewhere.²⁷ Baram wants to bring archeology up to date: he is interested in the making of the modern Middle East and the potential of Ottoman archeology in recovering a past free of the ideological and political distortions of today, and he proposes that findings in the local context can provide answers to broad questions of global significance, such as those relating to the historical processes of colonialism, imperialism, and the transition to modernity.

There is merit in Baram's position, but such is his zeal for his cause that he seems uninterested in periods whose relevance to these processes is not immediately obvious. Baram is also prominent in another conceptual debate—concerning what the term “historical archeology” should properly denote. The discipline known as historical archeology has a busy history, and the debate reflects differing attitudes towards the use of written evidence as a complement to archeological material in illuminating the past. Following North American practice, Baram takes issue with the use of the term “historical archeology” to mean the archeology of the long centuries of which documentary record exists, restricting it instead to a time closer to our own, to the “archeology of the modern,” that is, the archeology of the processes referred to above that brought the modern world into being.²⁸ The concept of historical archeology is discussed further in a substantial new edited volume on the archeology of Hungary in the Ottoman period.²⁹ The authors of one of its articles, József Laszlovszky and Judith Rason, trace how the connotations of the term “historical archeology” have altered over time and in different contexts (especially in Europe as opposed to the Americas) to produce what they describe as “terminological chaos.” However, although in European usage there is great variety in chronological designation—“medieval,” “post-medieval,” “early modern,” etc.—in

and of itself the term “does not imply a chronological framework, but is a branch of archeology in which the archeological source material can and should be compared with the written evidence.”³⁰

The Ottoman period in Hungary ended when the frontier was rolled back during the war of 1683–99, with the capture by the Habsburgs of fortifications that had been in Ottoman hands for some 150 years. Thirteen of the more than forty papers in the volume on the archeology of Ottoman Hungary address concerns similar to our own—the hypothetical reconstruction of the form of military structures that have partially or completely disappeared. Archeological investigation has been carried out at most of the sites studied, and excavation findings are analyzed in conjunction with documentary as well as narrative materials: the Ottoman archival material utilized in the case of the Hungarian fortifications is typically garrison pay registers and land and population surveys (*tahrir defterleri*), with ubiquitous and usually uncritical reliance on Evliya Çelebi's descriptions of individual sites. Given the present state of scholarship, the written and visual record—both Ottoman and non-Ottoman—for these fortifications in the seventeenth century appears to be richer than that for the northern Black Sea frontier in the same period. On the other hand, we must recall that the building registers belong to a time after the Ottomans had been forced out of Hungary, and while we may lack such abundant material as our Hungarian colleagues possess for the seventeenth century, this is made up for in the eighteenth.

The authors of the eleven papers in a volume on the historical archeology of the Ottoman Empire, of which Baram is coeditor with Lynda Carroll, seem to have internalized both the concerns of medieval archeologists that documentary evidence may vitiate the traditions of their discipline and the strictures of the new wave in Islamic archeology, for they write for the most part of the material finds associated with the ruled rather than the rulers, and only two resort to Ottoman archival documents to assist in their hypothetical re-creation of the past.³¹ In their introduction to the volume Baram and Carroll are polemical; however, they criticize the notion that historical archeology is typically nothing more than “archeological research of periods in which documents exist,”³² while at the same time asserting the complementarity of the archeological and archival records.³³ This collection is the first one dedicated to Ottoman archeology, and it may be anticipated that it will set the

agenda for future endeavor. It contains only two studies of major architectural remains, however—one on dendrochronology³⁴ and the other on lighting in mosques³⁵—and it must be hoped that this orientation will not detract from the efforts of those who give primacy to fortresses, palaces, and other imposing material remains of the past.

In our ongoing study of the Özi fortress complex we use the term “historical archeology” in the European sense as defined by Laszlovszky and Rasson. Furthermore, we contend that the study of past civilizations or even lone frontier fortresses through archival documents—of their major buildings as much as the quotidian material associated with them—need not be a naive or futile exercise. This is especially true when the results to be expected from archeological research are still modest, given the limited resources currently available to pursue such activity and also the fact that, in the present case, the Özi fortresses no longer exist. This makes analysis of the documentary evidence all the more important in the study of the Özi fortifications: until more architectural evidence is gathered, the study of whatever other archeological finds may come up, such as the clay pipes much favored by Ottoman garrison soldiers,³⁶ must, perforce, take second place, though not in terms of setting agendas or deciding the relative “importance” of information or subject matters. After all, fruitful research derives from successful conceptualization of a research program rather than from reliance on one sort of evidence at the expense of another, and those dismissively referred to as persisting in “cataloguing, classifying, collecting, and recording”³⁷ should recognize as much as those currently claiming the intellectual high ground that the challenge of recovering the past lies in analysis and interpretation of all evidence, with all the means at our disposal. The study of Ottoman fortresses amply lends itself to this end, for alongside the elites, thousands of the “silent” masses were connected with these huge structures—the engineers and toilers who constructed them, the troops who garrisoned them, and the civilian populations who lived in and around them; a study of the architecture in which and in relation to which these men and women lived is an essential step in understanding their lives. As to our research program relating to Özi, until a significant and pertinent volume of archeological evidence comes to the fore, we rely on the written documents in a virtual archeological endeavor—without, of course, ignoring or discounting the importance of

whatever hard archeological data there may be. However, once more architectural finds are made (thanks to the evidence of the documents, the acumen of the archeologist, or some combination of these), a fuller historical *and* archeological approach to our subject matter will be imperative.

THE GEOPOLITICAL AND STRATEGIC IMPORTANCE OF ÖZI IN THE FACE OF THE EXPANDING RUSSIAN EMPIRE

There were two great ages in the history of Özi. The first was the era of Cossack ascendancy in the Black Sea from the 1590s through the middle of the seventeenth century, when a single castle—or even one on each side of the mouth of the Dnieper—no longer sufficed, and a major complex comprising several castles completed by the 1620s became the main bulwark in Ottoman attempts to hinder the Ukrainian Cossacks as they passed to and fro by their wide lower-Dnieper highway during their sea campaigns. The second age was the eighteenth century when, in response to the ever-increasing threat from the newly constituted Russian Empire, the Ottomans strove to maintain their Black Sea “preserve” by modernizing and building anew the Özi complex and other northern Black Sea castles—a period when the outcome of the struggle between these powers was by no means decided. As this article is concerned with introducing the possibilities offered by the new-style building registers, we here limit our purview of the building history of the complex to the beginning of the time span covered by these registers, that is, the early part of Özi’s second great age. We here provide a sample of the copious material relating to construction works at the Özi fortress complex with the facsimile, transcription, and translation of a memorandum on a major period of upgrading of its fabric deemed essential in 1710 by the warden of the time, İsmâ’il Pasha, as well as with facsimiles and summaries of two additional documents from another building register covering 1706 and the turn of 1709 and 1710. In addition, we summarize an excerpt from an anonymous text in an Ottoman manuscript that may have drawn on a building register but is in any event more of a treatise on Ottoman Black Sea fortresses than a memorandum. Hereafter we intend to continue our study both by addressing Özi’s origins and development into a formidable early modern castle complex during its first, great, “Cossack,” age, and also with detailed assessment of later

phases in the construction and repair of the fortress complex at Özi later in the eighteenth century.

In the second half of the seventeenth century, that is, in the period between the two great ages of Özi, the anti-Cossack complex at the mouth of the Dnieper must have retained a significant degree of its strategic value. There is evidence that the Ottomans had reason to be wary of a resumption of the devastating Cossack raiding activity were the fortification and naval defenses of the sea to be eased.³⁸ However, as in this period the energies of the Ukrainian Cossacks were diverted from the Black Sea to internal and international conflicts over the fate of Ukraine itself, inevitably the state of repair and readiness of the Özi complex declined; this is clear from the Ottoman building registers of the 1690s. Nevertheless, in the next century, once the polity known as the Hetmanate (1648–1782) fell under firmer control of the Russian Empire, the Ukrainian Cossacks again constituted a serious threat to Ottoman well-being in the region, though now almost exclusively from land rather than sea. In the many conflicts between the Russian and Ottoman empires, the experience in steppe and siege warfare, especially of the Zaporozhian Cossacks, would play an important role in Russian successes.³⁹

During the reign of Peter I (1682–1725), Russia for the first time acted in earnest to gain a foothold on the Black Sea. Habsburgs, Venetians, and the Polish-Lithuanian Commonwealth joined together in a “Holy Alliance” against the Ottomans in 1684, following the failed siege of Vienna the previous year; in 1686 Russia also signed up, having demanded of Poland recognition of the 1667 annexation by Russia of left-bank Ukraine and Kiev as the price of participation. Each of the parties to the alliance attacked the Ottomans on a different front—Venice campaigned in the fringes of the western Balkans and in the Morea, the Habsburgs in the Danube basin, and the Commonwealth in right-bank Ukraine; Russia’s task was to prevent the Tatars from assisting the Ottoman imperial army, as was their customary assignment, and after making the necessary preparations, the Russian commander, Prince Vasilij Golitsyn, set off the following spring against the Crimean Khanate. In June, while he and his army were within some 150 km of the Crimean peninsula, the Tatar Khan burned the steppe, denying him food and fodder and forcing him to retire with huge losses. Undaunted, Golitsyn mounted another campaign in 1689 but again met with overwhelming logistic problems in the unfamiliar terrain; despite being harassed

by Tatar detachments as they marched through the steppe, he and his army managed to reach the isthmus of the Crimean peninsula at Or. This was the first occasion on which the Russian imperial army saw the Black Sea, but Golitsyn could not advance further into the peninsula and returned home defeated, again with great loss in men and matériel. Memories of Golitsyn’s defeats in the steppe and wariness of the Tatars soon caused Russian military men to look elsewhere to satisfy their ambition. After the seizure in 1696 of Azaq by Peter’s armies on his second attempt—he had failed to capture it the previous year—they turned their attention westward to prosecute what became known as the Great Northern War.

Russia was not party to the Treaty of Karlowitz of 1699, which brought to an end sixteen years of war between the Ottomans and Austria and her allies Venice and the Commonwealth, but agreed to peace terms with the Ottomans in Istanbul the following year. Özi came to prominence for the first time in many years following the defeat by Peter of his nemesis Charles XII of Sweden and the Cossack Hetman Ivan Mazepa at the battle of Poltava in 1709, after which they sought refuge in the fortress; about this Peter could do little. He was again at war with the sultan in 1710, and the theater this time was the Prut River, where he suffered a defeat at Ottoman hands the following year.

The Ottomans displayed an unbending determination to hold on to their Black Sea defense line and mounted a formidable effort that delayed Russian naval access to the warm waters of the Black Sea and beyond. Any dreams entertained in Moscow and later St. Petersburg of gaining a permanent foothold on the northern Black Sea shores, where there were few natural deep harbors, gradually took shape in the years after the Prut engagement. Already in the seventeenth century the Muscovite diplomat Afanasij Ordin-Nashchokin had proposed such a southward push as a strategic goal, but it was well into the eighteenth century before it became policy. In 1765 Peter Rumjantsev, one of Catherine the Great’s most successful military commanders, wrote that the Black Sea coastline must be the Ottoman-Russian frontier and the Crimea become part of the Russian Empire; he noted that there was no other practical way of “defending” Russia from the Ottomans.⁴⁰

Following the Ottoman victory on the Prut against Peter, the Ottoman and Russian Empires fought three major wars during the eighteenth century—from 1735 to 1739, 1768 to 1774, and 1787 to 1792. After Prut

both powers were engaged elsewhere, and the northern frontier was more or less peaceful. A clash threatened in the early 1720s in the Caucasus—considered by the Ottomans within their sphere of influence—when Russia assisted the rump Safavid state against its Afghan attackers, but diplomacy prevailed. Following the weakening of the Commonwealth as a result of the War of Polish Succession of 1733–35, Russia felt confident enough to declare war on the Ottomans in May 1735; Austria, allied with Russia, reluctantly joined the hostilities. In summer 1736 the Crimean capital at Bağçesaray (Bakhchysaraj) fell, and also the fort of Qılburun, at the extreme western end of the Crimean Khanate's territory on the left bank of the Dnieper, opposite Özi. In July 1737, the Russian army under Burkhard Christof Münnich captured Özi itself, and managed to hold it despite a tenacious counterattack by an Ottoman and Tatar force in October of the same year. Peace talks of 1737–38 came to nothing owing, *inter alia*, to the Russian Empire's extravagant claims to the Crimea, the Kuban steppe, and the Black Sea coast between the Danube and the Dnieper. In 1738 campaigning took place further west, and under the terms of the 1739 Treaty of Belgrade, Özi and all other strongholds and territories captured from the Ottomans during the war were returned. Russia refused, however, to return Azaq—won again from the Ottomans in 1733—which, under the terms of the treaty, was to be razed. Once a Russian army had shown that it could break through the northern Black Sea defense line, however, the Ottomans' worst fears were realized: they could no longer primarily depend on a physical barrier—be it the chain of fortresses or expanses of steppe—to protect Istanbul and the heartland; they became, in effect, reliant on the benign neglect of this frontier occasioned by the periodic struggles between their imperial rivals to north and west.

The Ottoman northern frontier was again quiet during the middle years of the eighteenth century, but in 1768 Sultan Mustafa III declared war against the empire of Catherine the Great, citing violation of Ottoman interests and interference in the sovereignty of the Polish-Lithuanian Commonwealth. Fighting was concentrated in the Danube theater, where the Russians bested the Ottoman forces. In 1771 a Russian army invaded the Crimea and obtained the acquiescence of the Khan, Sahib Gerey (r. 1771–75), that this Ottoman vassal state henceforth be regarded as independent; an agreement to this effect was signed in 1772. Peace talks between Russia and the Ottomans

founded on the Crimean question, but the increasingly parlous military situation of the latter forced them back to the negotiating table, and the Treaty of Küçük Kaynarca, signed in 1774, brought an end to hostilities. Under its terms Russia made significant gains at Ottoman expense, comprising the fortress of Kerş at the mouth of the Sea of Azov and land on the Dnieper estuary including Qılburun—but not Özi itself. In 1778, work began on a Russian naval base at Kherson, up the Dnieper from Özi.

The final act of the Ottoman-Russian struggle for possession and control of the northern Black Sea seaboard and steppe-lands was not long delayed. In 1783, following almost ten years during which the Khanate had been nominally independent, the Russian Empire annexed the Crimea, and in 1787 Sultan 'Abdülhamid I declared war to regain the first Muslim territory to be lost to his empire. Austria again took part. In August of that year Ottoman naval bombardment of Russian-held Qılburun failed, while in June 1788 General Grigorij Potemkin's army laid bloody siege to Özi; in December Potemkin was rewarded with victory. Thus ended some two and a half centuries of Ottoman presence in this section of the northern defense line. Thereafter fighting shifted west. In 1790 the Russians occupied Ottoman fortresses on the lower Danube, and their armies also engaged the Ottomans to the east, in the Kuban. Under the terms of the Treaty of Jassy, which concluded the war in 1792, the Ottoman-Russian border was set at the Dniester in the west and the Kuban River in the east; only the fortresses at the mouth of the Danube now remained—for a few years longer—to bear the burden of Ottoman defense against a triumphant Russia.

THE SCIENCE OF FORTIFICATION AND THE BUILDING HISTORY OF ÖZİ: THE YEARS 1695–1710

Fortifications such as those around the northern Black Sea were extremely costly to build and maintain because of their remoteness from materials and labor, and there was accordingly little incentive to anticipate developments in the technology and creativity of attackers before a potential threat became real.⁴¹ The Italians had been the first to respond to the challenge presented by siege artillery capable of wrecking the high, straight walls of the castles of medieval Europe with constant bombardment, and by the early sixteenth century they had invented the defensive fortress—a

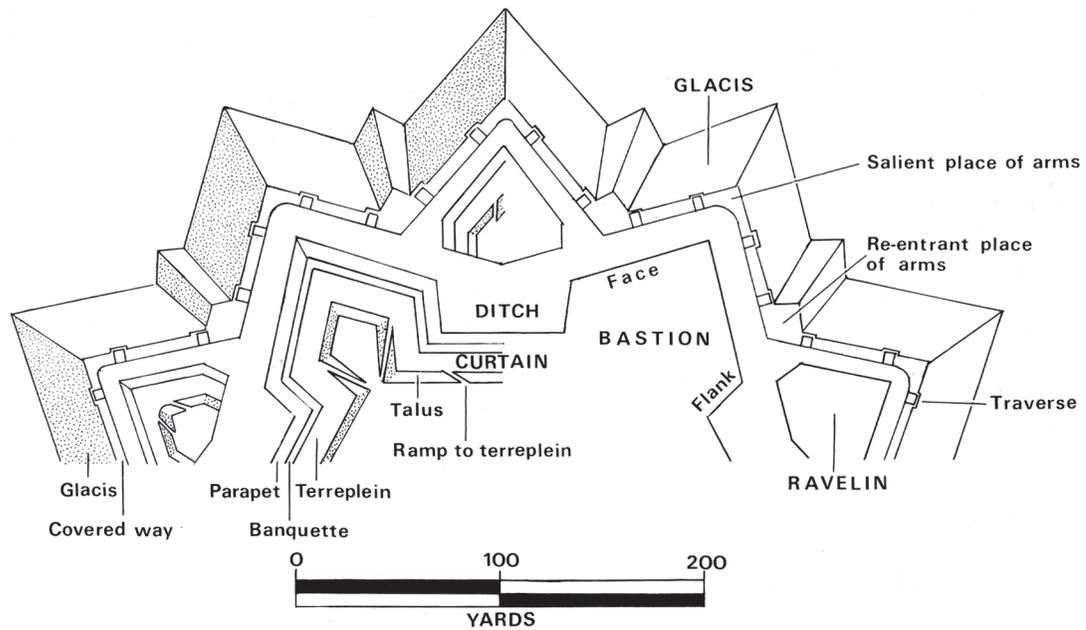


Fig. 4. Trace (ground plan) of a simple bastioned front. (From Duffy, *Siege Warfare*, vol. 1, 3; reprinted with permission)

low structure with thick, solid, earthen ramparts in which cannon balls might become embedded, but that they would be unlikely to breach. At the same time, the round towers of the Middle Ages evolved into bastions—projecting works with four sides set at an angle to one another (fig. 4), designed to work in concert to allow cross fire from the cannon housed within to fully cover the ground across which besiegers might make their assault. During the course of the century, a single or double line of defense gave way to “defense in depth,” by which the inner castle was protected by a series of fortified works (fig. 5), with extra detached outworks added for further security (fig. 4 shows only one type, the ravelin); the besieged thus gained the advantage over the besiegers, since the designers of artillery could not keep pace with the ingenuity of the designers of fortresses. The Dutch did not catch up with the Italians until around 1600 but added some innovations of their own, while the German and French styles were essentially imitative in conception. It was not until the mid-seventeenth century, and the France of Louis XIV, that the science of fortress warfare advanced again.

To ensure that a fortification had the greatest chance of withstanding a siege, its rampart had to be “spacious

and low-lying enough to provide a stable platform for artillery, and to evade or resist the blows of enemy shot”; there had to be “a ditch and a wall that were sufficiently formidable to deter escalade” (i.e., scaling of the walls); and the trace (i.e., ground plan) could leave no “dead ground” that might allow an enemy to reach the rampart unscathed.⁴² The two men most highly regarded for their contribution to the science of fortification in the second half of the seventeenth century were the Dutch military engineer Menno van Coehoorn (1641–1704) and the Frenchman Sébastien Le Prestre de Vauban (1633–1707). Coehoorn’s contribution relied on powerful fire from batteries concealed within low works; he allowed ample space for the defenders to assemble and move to their positions; and, profiting from the high water table in the Netherlands, he deepened the defense with a series of alternately wet and dry ditches. Vauban established principles that were put into effect in the many fortresses he built for Louis XIV; however, his immense contribution to improving siege techniques, particularly his development of parallel and zigzag mining, outweighed his defensive innovations, which amounted to redesigning bastions to offer maximum protection to the fortress and also to limit the risk to its defend-

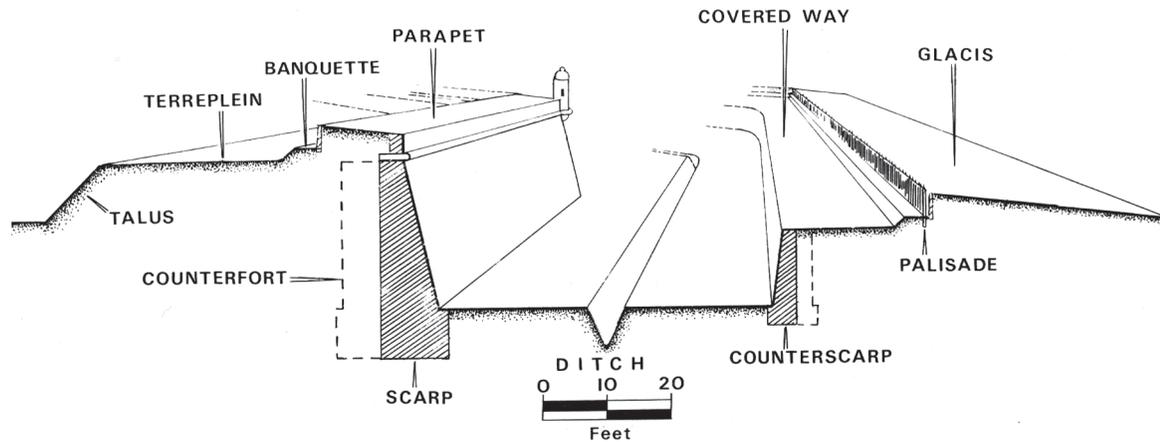


Fig. 5. Profile of fortification. (Duffy, *Siege Warfare*, vol. 1, 2; reprinted with permission)

ers by imposing obstacles between a breached bastion and the rest of the fortress.

During the sixteenth century Ottoman castles on the borders of the empire or along campaign routes were represented in the stylized miniature paintings illustrating texts recounting the glories of conquest; by the seventeenth century this practice had ceased, as the empire reached the limits of its expansion.⁴³ There are therefore no such representations of Özi because, until the second half of the sixteenth century when the Cossacks gradually extended their operations beyond the northern seaboard of the Black Sea, this castle was a fortification of only local importance, albeit one that controlled a key river crossing. The earliest detailed pictorial representation of Özi we have so far located is an annotated ground plan—or trace—of the Main Fortress, dating from 1737.⁴⁴ This appears to have been drawn around the time of Münnich's successful siege, and its printed version is found in the memoirs of General Christof Hermann von Manstein.⁴⁵

There is also a version of the trace annotated in Ottoman (fig. 6), which we assume to have been based on the Manstein version.⁴⁶ This is of considerable interest; it is headed "Özi fortress as it was when besieged by Russian troops in 1150 [May 1737–April 1738], and a drawing of this fortress with the repairs and additional fortification considered necessary according to current circumstances." As indicated in the heading, this document in fact comprises two traces—one the Ottoman version of the "Manstein trace," and the other a proposal for the upgrading of the fortifica-

tions of the Main Fortress. The latter may perhaps be dated to some time after the treaty of 1739 according to which Özi was returned to the Ottomans. The existence in Ottoman archives of fortress traces is known, but few examples have been published, and where published, they have not been adequately valued as documentary evidence.⁴⁷

We will return to fuller consideration of the Ottoman traces of the main Özi fortress at a future time; at the present stage of our study this document serves two main purposes. First, it elucidates the report of Evliya Çelebi, who on his visit in 1657 described the three separate, adjacent enclosures we have referred to as the Upper, Middle, and Lower Castles—indicated in the trace by the notations ا, ب, and ت, respectively.⁴⁸ Secondly, the rampart shown surrounding the upgraded complex is that whose construction in the early years of the eighteenth century is described in the latter two of the three memoranda of wardens of the fortress complex we present below.

Fortification of the site of Özi was no simple undertaking, and the considerations mentioned above regarding a general disinclination to innovate were particularly relevant. The fortress complex was isolated, the steppe was lacking in trees and timber and sufficient quantities of good stone for building or dressing works, and labor had to be brought from far away—thus building works were all the more expensive. Taking into account the trying physical geography, the weak human base, and the dangers posed by the steppe inhabitants and Cossack and other interlopers from the north, the construction and maintenance at

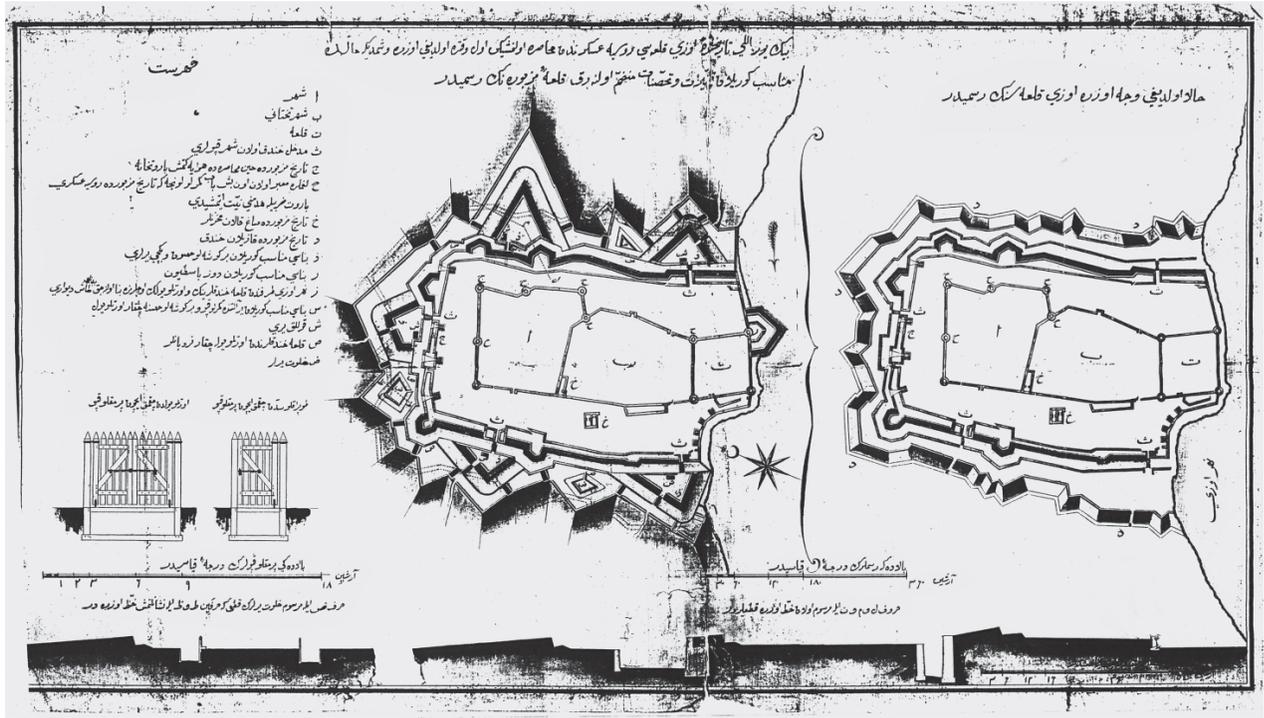


Fig. 6. Two Ottoman traces of the Özi Main Fortress: actual and proposed, 1737. (BOA, Plan ve Proje, 857)

this site of one of the largest Ottoman fortress complexes in the empire was an impressive achievement. If Evliya Çelebi's mid-seventeenth-century description of the walls of the Main Castle of Özi indicates that they resembled the high stone walls of medieval Europe—contemporary Europe having ceased building such walls, for the most part, over a century earlier—it was because there was no need for them to be otherwise. As Cossack aggression against the Ottomans in the first half of the seventeenth century was mostly mounted by boats bearing only light field guns—mainly falconets—there was no risk that the old-style high, straight walls of Özi would be rendered obsolete by modern siege artillery; at that time neither Özi nor the other Black Sea fortresses required the type of fortifications employed by the West European states who were constantly besieging one another's fortresses across the length and breadth of that continent. Their lack of modern siege artillery in the first half of the seventeenth century did not mean that the Cossacks were not a threat to Ottoman Black Sea strongholds, however, for on the coasts of Rumeli and Anatolia numerous Ottoman fortresses were overcome by

their sea campaigns. Too little is known of the details of how cities such as Varna and Trabzon were repeatedly sacked by the Cossacks, but in at least some cases stealth and surprise along with adept scaling of walls may have been decisive.⁴⁹ In addition, as was shown in their capture of Azaq in 1637, the Cossacks were quite formidable in sapping and mining.⁵⁰ Although Özi was attacked by the Cossacks on at least several occasions that can be documented, it seems never to have fallen to them during this period. This may have been due to its large garrison and formidable fortress works—even if in the old style—or it may have been that Ottoman settlements on the Rumelian and Anatolian coasts provided richer pickings than this steppe frontier stronghold.

We have already pointed out that during the second half of the seventeenth century the threat from the north to Ottoman trade and territory receded as Ukrainian Cossack pressure eased. At that time the Cossacks were swept up in the evolving political relations among the Ottomans, Poland-Lithuania, and a more expansionist Muscovy, set in train by a massive Ukrainian uprising that began in 1648 and was led by

Bohdan Khmel'nyts'kyj, the Cossack Hetman who in 1654 brought his realm under the suzerainty of Muscovy. Eventually a new threat to Ottoman dominion over the Black Sea would emerge with the metamorphosis of Muscovy into the Russian Empire. Although Golitsyn's campaigns across the steppe in 1687 and 1689 failed, that a Muscovite army could reach Or impressed the Ottoman authorities. The seizure of Azaq by Peter the Great in 1696, after he failed to take it the previous year, showed that Russia was emerging as a new and dangerous foe.

Golitsyn's campaigns had been the first intimation that the Ottoman fortresses of the northern Black Sea littoral, and Özi in particular, might come under sustained attack by a well-equipped army: Peter's first siege of Azaq made the danger all the more tangible. Perhaps because the Porte was aware of Peter's intentions against Azaq, in 1695 a survey was conducted at Özi to ascertain needed repairs and construction to the complex, and some minor repairs were carried out.⁵¹ The Main Castle of Özi (comprising the Upper, Middle, and Lower castles) was described at this time as being 1,325 *zîrâ'* (993.8 m)⁵² in circumference,⁵³ with fifteen towers and six gates, and because earth was used in its construction it was in poor condition and considered inadequate to stand up to enemy attack; the surveyor accordingly recommended construction of three bastions (*tābya*) to protect both the thin-walled castles and the *varoş*, or suburbs, outside the walls. No detail is given of exactly where these bastions might be situated, but they would presumably be placed where it was estimated they could provide maximum fire cover. The walls of the stone (*taş*) fort of Qılburun, 230 *zîrâ'* (172.5 m) in circumference and 12 *zîrâ'* (9.0 m) high, needed to be repointed and raised in height by 2 *arşun* (1.5 m).⁵⁴

The fall of Azaq to Peter the Great in July 1696 suggested that Özi might be more vulnerable to Russian attack than the Ottoman authorities had been aware, or willing to admit. That autumn various construction materials were ordered, including stone and lime (the latter from Aqkerman), nails (from Wallachia), and wooden stakes (from Moldavia), and work got under way. Furthermore, four barrack blocks were to be built in the barbican (*hişār beçe*) of the Upper Castle and in the interior side of its palisade⁵⁵ for troops both local (*yamaqs*) and from the center (janissaries, *cebecis*, cannoneers, and *serdengeçdis*).⁵⁶ There is no reference here to the building of the three bastions recommended the previous year, but we may assume that

the materials referred to were to be used in their construction. In Ramadan 1110 (March 1699) it was considered necessary to fortify Qılburun further because the Crimean Tatar Khan sent news that the wall of the fort facing the open sea had collapsed, and a bastion built there the previous year was destroyed and needed rebuilding; in addition, a new bastion was needed on the corner of the fort fronting the Dnieper. Knowledgeable people sent to survey the site thought one new bastion insufficient, and an imperial order was accordingly given for the construction of the four—one at each corner of the fort—that they deemed necessary.⁵⁷ In 1694–95, it seems, the Ottomans had felt no need to fortify Qılburun with bastions, believing the Main Fortress at Özi strong enough to withstand attack from their northern neighbors, whether imperial Russian forces or their Cossack subjects. (From this period on we refer to the Main Castle and its constituent parts as the Main Fortress,⁵⁸ since it seems to have been recently reinforced by three bastions; for various parts of the fortress, our sources continue to use the names of the three constituent castles for the sake of orientation.) Reference to bastions at Qılburun soon thereafter suggests, however, that the perceived threat there had increased. The program of building the four bastions at Qılburun began on 1 Muharram 1112 (June 18, 1700).⁵⁹ The area (*cirm*)⁶⁰ enclosed by each of these bastions was to be 40 sq. *zîrâ'* (30.0 sq. m)⁶¹; only wooden material is mentioned—timber (*kerāste*) and earth-filled wattled hurdles (*çat rih̄tim*). Parts of the fabric of Qılburun had deteriorated so much that a 1702 appraisal of needed repairs to the mosque within this fort indicates that it was in such a bad state that the five daily prayers could no longer be performed in it.⁶²

In *Zübde-i Vekāyi'āt*, the contemporary chronicle of the sometime imperial treasurer Defterdar Sarı Mehmed Pasha, there is a report that one of the Özi castles was struck by lightning in July 1702.⁶³ Archival records show that lightning strikes were fairly common events that frequently necessitated rebuilding work on Ottoman fortresses. Sarı Mehmed Pasha's text is remarkably close to that in the register detailing the subsequent repairs, suggesting that the register may have been his source. The lightning bolt hit the tower near the "small gate of the Old [i.e., Upper] Castle at Özi." The gunpowder magazine was at this time built into the wall of this tower, and the structure was so damaged that a hole was left in the castle wall exposing the barrels of gunpowder inside. Seven houses in

the vicinity were also destroyed.⁶⁴ In medieval Europe, gunpowder had typically been stored in towers of the main structure of a castle, but this risky practice had been abandoned in the sixteenth and seventeenth centuries in favor of freestanding magazines. The explosion at Özi nevertheless did not convince the authorities that a freestanding structure was required, for it was ordered that the repairs restore the depot to its former state (*vaz^c-i qadīm*). A wall of the Fort of Hasan Pasha was also found to be damaged by the lightning: the wall fronting onto the Dnieper had collapsed from end to end down to its foundation.⁶⁵

The peace of 1700 had required Russia to raze its strongholds on the lower Dnieper, between Özi and the lands of the Zaporozhian Cossacks, but the Ottomans were doubtless alarmed when another was built at Kam'janyj Zaton in the Zaporozhia,⁶⁶ and in 1705–10 a sustained program of repair and construction was undertaken at Özi.⁶⁷ Each structure of the Özi Fortress complex—the Main Fortress, the Fort of Hasan Pasha, and Qılburun—was appraised and the go-ahead given for the necessary works. One was the renewal of the wattled screens (*çit sipperleri*) at the ramparts outside the Upper and Middle castles—a double row in front of the ditch to repel assault by besieging infantry, rows on top of the cannon bastions (*top tãbyalari*), and rows for musketeers in unspecified places.⁶⁸ These screens were relatively fragile and deteriorated easily; typically they were repaired—at least in Western practice—only when a threat was imminent. Although these and some other repairs—such as the re-roofing of the ordnance depot at Qılburun and the reinforcing with additional earth and new stakes of an earth-supported palisade wall of Qılburun (*dikme şaranpav dıvãrınuñ topraq dolması*), which faced the water and had been damaged by waves—may seem relatively minor, they were essential to the security of the fortresses.⁶⁹ In the early eighteenth century, as a first line of defense and to keep the cannon of besiegers, as well as their infantry, at a distance, at least some of the individual fortifications at Özi were surrounded by palisades of upright stakes supported by earth—or by double rows of stakes with earthen infills. These latter must have been sturdier than the wattled hurdles mentioned above; it is interesting that wattled screens are no longer mentioned in our sources for subsequent years, which suggests that their use may have been phased out. On the other hand, the functions of these two types of barrier may have differed, and our coverage may not be complete enough to rule out the further application of the *çit sipperleri*.⁷⁰

In 1706 the incumbent warden of the Özi fortresses, İbrahim Pasha, wrote a memorandum (*qã^cime*)⁷¹ on the works he considered necessary there (fig. 7). His communication, entered in the building register in Istanbul in précis (*hulãşa*) on 13 Dhu 'l-Hijja 1117 (March 28, 1706), has the following points, which we paraphrase:⁷²

İB.1 A stretch of soft rock (*kesme toprağı*) from the inner face of the earthen ditch outside the barbican of the Upper Castle—of dimensions 60 *zırã^c* (45 m) long and 25 *zırã^c* (18.8 m) high⁷³—has slid into this ditch and filled it. If it is necessary to provide this ditch with a revetment (*taş dıvãr*, “stone wall”), 200 barges (*tonbaz*) of stone will suffice; if it is necessary to use timber check-board frameworks (*şatranç çatma*), they should be of dimensions 7.5 x 7.5 *zırã^c* (5.6 x 5.6 m) and—since standard palisade-type stakes (*şaranpav* [also *şaranpav*]) are each 5 *zırã^c* (3.8 m) in length and unsuitable for this purpose—1,500 palisade-type stakes, each 15 *zırã^c* (11.2 m) in length and cut in half, as well as 30 *qantãr* (1,695 kg)⁷⁴ of nails would be needed.⁷⁵

İB.2 Though in the previous year the ditches were cleaned out, the past winter has been harsh, and the operation needs to be repeated; this is a difficult task for the local people of this frontier (*serhadd fuqarãsi*) to undertake, and it is necessary that boats be sent to help them.⁷⁶

İB.3 It is necessary to repair a stretch of wall—46 *zırã^c* long, 2.5 *zırã^c* wide, and 9 *zırã^c* high—to the right of the Qılburun Fortress gate and going as far as the supply tower (*mühimmât qulesesi*), which has become ruined. (This passage mentions necessary materials—lime, stone, timber suitable for constructing scaffolding [*iskelelik bir miqdãr kerãste*])—and, interestingly, notes that the latter material will be purchased from Cossacks [*qazaq tã^cifesi*].)⁷⁷

İB.4 The palisade of upright stakes (*dikme şaranpav*) and its filling (i.e., earth packed between parallel rows of stakes) located outside the Lower Castle and the palisade of the bastion of Hüseyin Pasha (this bastion was located on the east wall of the same castle)⁷⁸ are on the verge of collapse; 700 oak trees suitable for fashioning palisades and 200 *cerãhor* (fortress repair and construction laborers) and 20 carpenters are needed to effect their repair.

İB.5 For these castles, in the previous year (1116 [May 1704–April 1705]) a quantity of timber (*kerãste*) was ordered from Moldavia; some of it reached Özi, but the remainder was transported only as far as Aqkerman. The *voivode* of Moldavia must be ordered to arrange for the transport of the remainder so that repairs can begin the current spring. (Among the various types of wood men-

tioned are staves [*şindere tahtası*], nails for joining staves [*şindere mismāri*], rods of rectangular cross-section [*çibuq, çubuq*],⁷⁹ stakes [*qazıq*], oak boards [*meşe tahtası*], large beams [*balvan-i kebîr*], and stakes for planting upright [*dikme şarampav*].)

İB.6 The bath (*hammām*) built by the Grand Admiral Hasan Pasha when he constructed the Middle Castle (in the 1620s) was found to have been in a ruined state for over fifty years, and since the castle has no other bath, it needs to be repaired.⁸⁰ (In the words of İbrahim Pasha, the rebuilding of the bathhouse would revitalize the “well-protected frontier” [*serhadd-i mansûre*] and “bring about the blessings of its population” for the sake of the sovereign.)

As can be seen from fig. 7, the summary of İbrahim Pasha’s memorandum is surrounded by marginal notes that record further comments contained in *fermāns* (written orders by the sultan or a high official in the name of the sultan) issued in response to the points he raised. In addition, following the memorandum is an almost full-page section containing additional information from local experts (*ehl-i vuqūf*) and proposals for a course of action by an unnamed high official at the Porte—possibly, we suggest, a ranking officer of the Bureau of Building Supervision (*Binā emînliği*).⁸¹ Similar sections following such memoranda are common in the building registers used in this study and can be seen in the other two documents presented here (figs. 8, 9). Their contents vary, however, and their diplomatics remain to be analyzed, but they seem to be summary copies of *telhîşes* (memoranda by high officials intended for the sultan or another senior authority), or, more often, a combination of extracts from *telhîşes*, drafts or copies of *fermāns*, and even *tezkeres* (brief memoranda of the *Mâlîyye* issued to initiate or record a financial transaction).

Clearly the most vexatious task confronting İbrahim Pasha was the maintenance of the ditch. From the additional texts that crowd the two pages where his memorandum is registered we learn that the entire ditch of the Main Fortress, which is estimated to be 2,500 *zirā*^c (1,875.0 m) long, was unrevetted and had to be cleared out every year; the previous winter had been so harsh that the collapse of the ditch allowed horsemen to pass across it. Experts on the scene (*ehl-i vuqūf*) gave testimony that revetting the inner face of the ditch with one layer of stone (*bir qat taş*) would strengthen it so that it would require less maintenance. Moreover, a calculation was submitted by an unnamed official who processed the experts’ estima-

tion of the money needed to finance the requisite number of barge loads (*tonbaz*), estimated at 1750, to carry enough stone to revet both faces of the entire ditch. The total surface area (termed *cirm*)⁸² to be revetted, given that the ditch was approximately 2,500 *zirā*^c long and 7 *zirā*^c (5.2 m) deep, was estimated at 35,000 sq. *zirā*^c (19,500 sq. m). We stress that the figure for depth is an estimated average;⁸³ thus when specific parts of the ditch are discussed, different figures are provided (25 *zirā*^c in İB.1; 12 *zirā*^c in HA.1). Given the low value of this figure, there is also a possibility that only 7 *zirā*^c of the side of the ditch—presumably the bottom part—were revetted, and the true average depth of the ditch was slightly greater.

The building and maintenance of ditches was a difficult and wearisome task: leaving the earthen sides packed down and exposed was the cheapest option but, as we have seen, they tended to crumble into the ditch, which then failed to perform its defensive function; earth faced with stone needed less attention but was more expensive to build. Fifteen months later, the revetment of the inner side of the ditch was incomplete and the outer face, which was still exposed earth, was in such bad condition that the ditch needed digging out yet again;⁸⁴ despite İbrahim Pasha’s hopes, the revetment work had still not been completed in Muharram 1121 (March 13–April 11, 1709), when it was recommended that a palisade (*şarampav*) be built outside the ditch.⁸⁵ We have not yet located evidence of precisely when this ditch was re-dug. (Its original construction is not referred to in the records of the upgrading of the Özi Main Castle in 1695, discussed above, but it was clearly in existence by 1705 and must therefore have been built between these two dates.)

The documents copied or summarized in the margins to İbrahim Pasha’s memorandum are full of further complementary detail. For example, we learn of the fittings required for the restored bathhouse—a hot water cauldron (*hazgan*) weighing 80 *vuqiyye* (102 kg)⁸⁶ and three basins (*qūrna*) with taps (*lüle*). However, only a few years later, in 1123 (February 1711–January 1712), it is recorded in another register that the rebuilt bathhouse was damaged by fire and rendered unusable and is to be repaired anew; again three new basins are mentioned, but now the number of taps needed—fifty—are specified.⁸⁷

İbrahim Pasha was succeeded as warden at Özi by ‘Abdürrahman Pasha, followed in turn by Hasan Pasha, who wrote a memorandum on the continuing works there, and what remained to be done to ensure the

defense of Özi and the well-being of its garrison.⁸⁸ Although the completion of the works had been scheduled for 1120 (March 1708–March 1709,⁸⁹ a number of repairs to the Main Fortress were still outstanding at the end of December 1709 and the beginning of January 1710.⁹⁰ Here we provide a facsimile of the text (fig. 8) and a paraphrase of the relevant points.

HA.1 A 50 *zirā'* (37.5 m) stretch of the new stone masonry revetment of the ditch (*kārgīn*⁹¹ *handaq dīvān*)—of dimensions 600 *zirā'* (450.0 m) long and 12 *zirā'* (9.0 m) deep including its foundation (*temel*)—that is under construction has cracked and is leaning;

HA.2 Seven bastions upon the ditch of the fortress are incomplete and not high enough; stone masonry or timber framework (*çatma balvan*)⁹² needs to be added to increase their height by 3 or 4 *zirā'* (2.2–3.0 m);

HA.3 The below-ground portion of a 200 *zirā'* (150.0 m) stretch of the stone masonry revetment of the ditch built by former warden İbrahim Pasha is deficient in height and needs 4 or 5 more *zirā'* (3.0–3.8 m) of stone masonry;

HA.4 A palisade (*şaranpav*) of length 1,980 *zirā'* (1,485.0 m) has been newly placed outside of the ditch from “river to river” (i.e., around the three landward sides of the Main Fortress), and beyond [the outer side of] the palisade a sun-dried brick (*kerpiç*)⁹³ wall of 1 *zirā'* (0.75 m)⁹⁴ has also been built; however, earth has not yet been dumped onto the wall and the gap remains empty;

HA.5 The width of the ditch varies between 8, 10, 12, and 13 *zirā'* (6.0–9.8 m) and needs re-digging to make it equal; it also needs cleaning out. Besides this, a stretch of the stone and mud revetment of dimensions 1,480 *zirā'* (1,110.0 m) long and 12 *zirā'* (9.0 m) high in some places and 8 *zirā'* (6.0 m) in others, ordered this year to be built from “river to river” (i.e., around the three landward sides of the Main Fortress), has not yet been built;

HA.6 There are no embrasures (*mazgal*) for the musketeers within the castle and these are needed; and since a new palisade is also being erected, up to 4,000 more palisade stakes (*şaranpavluq; şaranpavluq ağacı*) are needed for these places in addition to the 1,500 left over from this year's building works, and also for increasing the height of the bastions;⁹⁵

HA.7 After an appraisal (*keşf*) of places for building a new armory (*cebehâne*) within the fortress, it is instead considered appropriate to repair two towers so as to make them suitable for storage of ordnance;

HA.8 Water for the people of the fortress comes from wells situated a quarter or a half or a whole hour away; it would be impossible to protect the water supply in an emergency, and a cistern that would fill up with winter

rain is urgently needed; this should be built inside the ditch (*derün-i handaq*) at its two ends (i.e., where the ditch meets the river) and be 20 x 20 *zirā'* (15.0 x 15.0 m) and as deep as it is possible to dig;⁹⁶

HA.9 8 rooms of dimensions 50 x 7 *zirā'* each (37.5 m x 5.2 m) have been built within the fortress as barracks for the two battalions (*orta*) of janissaries, totaling 1,000 men, who are newly assigned to protect the Özi fortresses; the existing barracks are inadequate;⁹⁷

HA.10 The mud needed for the 200 *zirā'* (150.0 m) stretch of the ditch wall and the stone masonry needed for the desired cisterns is not to be found in the fortress and needs to be brought here; the lime produced by the existing 11 lime pits in the fortress is insufficient, and more is needed.

Hasan Pasha was soon replaced as warden by İsmā'il Pasha, whose recommendations concerning the Main Fortress were recorded at the central offices in Istanbul on 25 Dhu 'l-Hijja 1121 (Feb. 26, 1710) (fig. 9).⁹⁸ İsmā'il Pasha's memorandum is more detailed than Hasan Pasha's, but since it was made only a few weeks later, it reveals a number of common concerns and, most significantly, that construction of seven bastions was underway at this time (İS.2, İS.6) and that, like designers of ramparts everywhere, those at Özi faced the tendency of the ditch revetments to collapse as earth was removed from the ditch and placed atop the rampart (İS.1). The physical characteristics of any site where ramparts were built affected their configuration, as did an informed assessment of the risks to which the fortress might be exposed; the preferences of individual military architects also influenced the decision. Just as the ground plans of bastions could vary according to differing opinions concerning the angles of the bastion walls that were most advantageous, ramparts also varied in profile; they might have single or double ditches, wet or dry; their earthen bulk could be revetted or half-revetted in either stone or stone masonry, or unrevetted altogether. Reading İsmā'il Pasha's recommendations as well as other building registers relating to Özi, one is struck by the degree of difficulty presented by building and maintaining revetted ditches. It seems that nature was most unforgiving of errors in design or construction; soil conditions and climate were such that, for example, a defectively built revetment could, within a season, require partial or total reconstruction (İS.1, İS.3, İS.5). Furthermore, achieving the perfect relationship between ditch and rampart was a highly skilled task, and, since it was hardly feasible to bring extra earth for the rampart

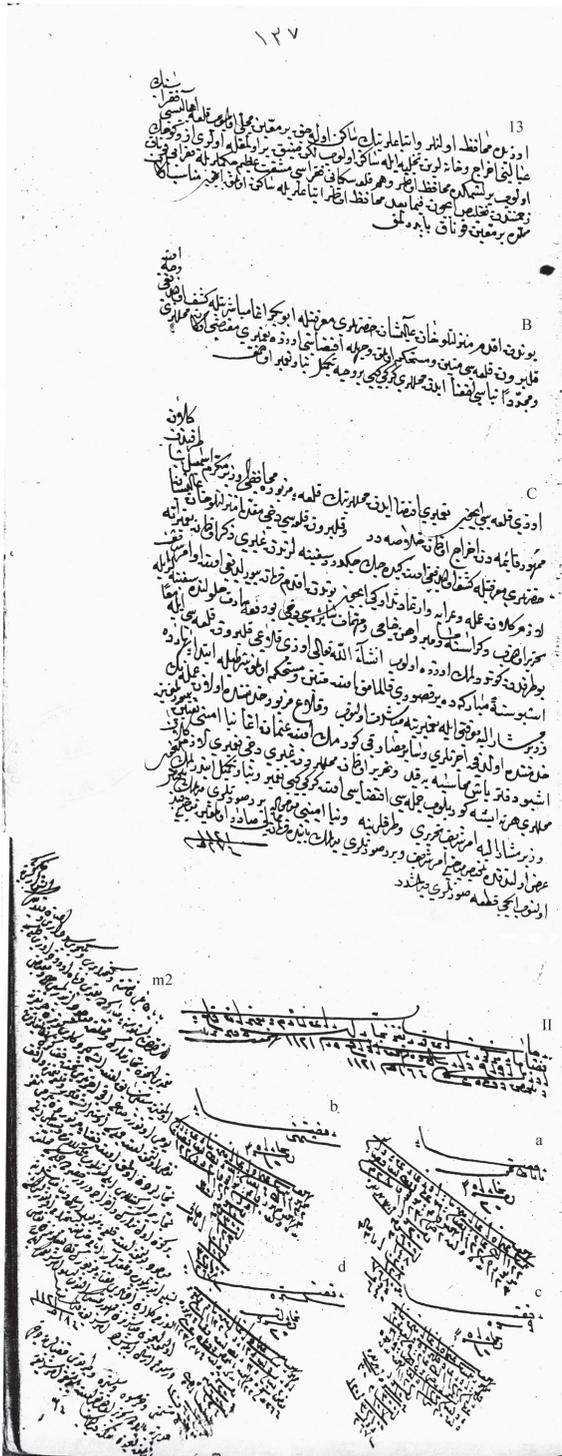


Fig. 9b. Continuation of memorandum (qa'ime) of İsmail Pasha. (BOA, MAD 3822.137)

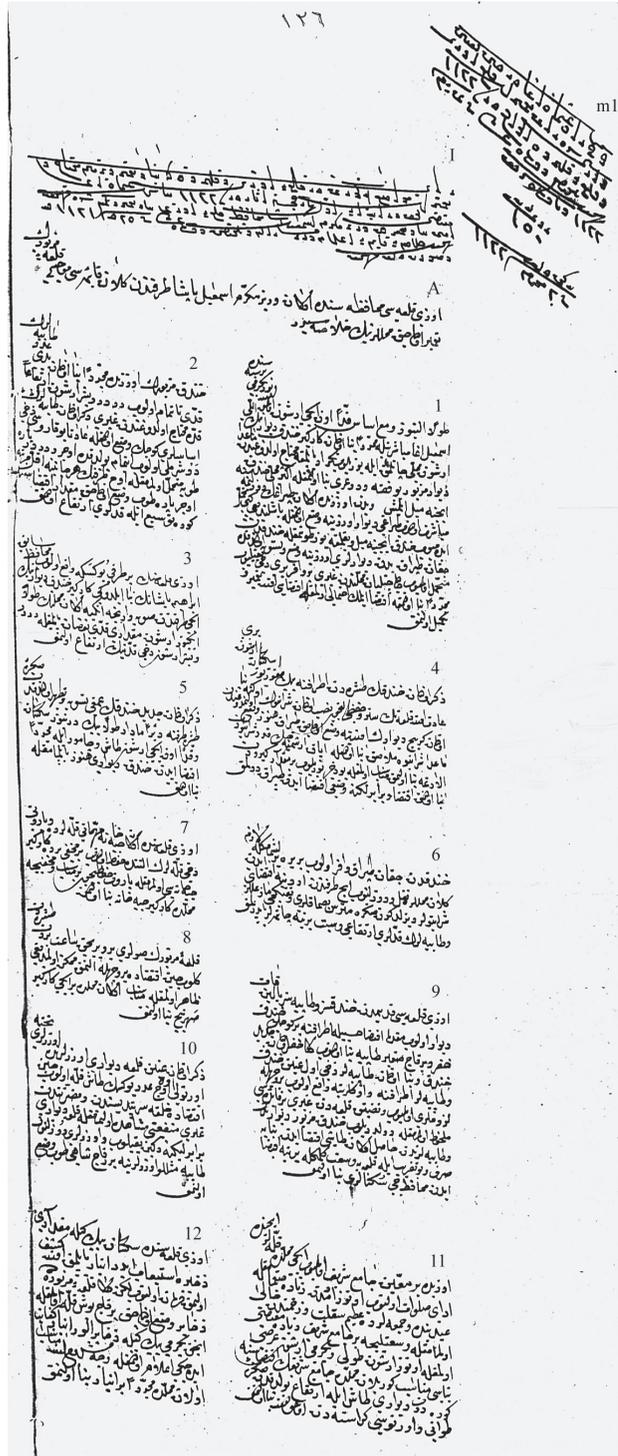


Fig. 9a. Memorandum (qa'ime) of İsmail Pasha, registered in the defter on 25 Dhu 'l-Hijja 1121 (February 25, 1710). (BOA, MAD 3822.136)

from elsewhere, or to remove the extra earth from the ditch to another site, an important feature governing this relationship was that the earth dug out of the ditch was used to build up the rampart. Problems in constructing the one invariably brought problems with the other: put simply, the more earth that was excavated from the ditch to form the rampart, the heavier the rampart, hence the less able the ditch to support the added weight and the more likely its earthen sides to collapse or its revetments to crack. Ensuring that the ditch was of constant depth and designing the rampart in such a way that it was kept clear of debris also demanded considerable expertise.

Both Hasan Pasha and İsmâ'il Pasha were concerned that the seven new bastions being built were not high enough; İsmâ'il also worried that their foundations would be insufficient to support the extra height needed and inadequate to carry the three or four cannons to be placed atop each bastion; he accordingly recommended that they be widened (İS.2). Another improvement at this time was the construction around the three landward sides of the Main Fortress, outside the ditch, of a palisade of stakes supported in front by earth from the ditch, and of a sun-dried brick wall (İS.4). İsmâ'il Pasha recommended that earth remaining from the ditch once the palisades had been adequately supported be used for constructing the musketeers' embrasures that Hasan Pasha had noted were lacking at Özi, and also for making staircases or ramps; the remainder, he suggested, might be used to increase the height of the bastions. He also noted that wooden frameworks should be put in place as foundations where "baskets" (*sepet*)—probably gabions, or woven branches filled with earth, used to provide extra cover to the defenders—were to be erected (İS.6).

Hasan Pasha reported that an appraisal showed that two towers of the fortress could be repaired and used for storing ordnance, and that there was no need to build a dedicated depot; however, İsmâ'il did not agree and recommended that a new depot be built (İS.7). He agreed, though, with Hasan's proposal that two cisterns were needed for the storage of water for the garrison and the people of the fortress, since the wells from which they then drew their supply were far away and could not be reached in an emergency (İS.8). Moreover, he ignored Hasan's curious recommendation that cisterns be built within the ditch, and proposed instead that they be built in "a suitable location." İsmâ'il referred to Hasan's desire for new bar-

racks only indirectly, if at all (İS.13), for he nuanced it in terms of competition between the garrison and the inhabitants of the fortress for living space and insisted that the garrison be provided with purpose-built quarters so that the local people could return to their homes. Nevertheless, it does seem curious that there had hitherto been no provision for a garrison numbering at least 1,000 men (HA.9); and we suggest that the growing sense of insecurity at Özi had led to a sudden and unanticipated increase in the size of the garrison. İsmâ'il also failed to acknowledge Hasan's concerns about a shortage of essential building materials; instead he wanted built a new mosque sufficient for the garrison to gather in on Fridays and during major holidays (İS.11), and a granary (İS.12). Until that time prayers had been said, and grain stored, in the towers of the early-seventeenth-century Main Castle (İS.11).

In particular, İsmâ'il Pasha had further advice on the modernization of the fabric of the fortress—which provides us with important details on its evolution. Previously, he wrote, the fortress had neither ditch nor bastions, and its wall was of single thickness. When a ditch became necessary one was built, together with some small bastions.⁹⁹ The ditch and (seven) bastions currently under construction rendered the old ditch and bastions obsolete, and he recommended that the old ditch be filled in and the stone from its revetment and bastions reused in the present building works; the remainder could be used for houses for the defenders (İS.9). He also recommended that the thirteen stone towers of the Main Castle be demolished down to the level of the walls, and that the resulting cut-off towers, which would then resemble bastions, be used as platforms for light cannons (İS.10).

Additional pieces of information relating to, but not an integral part of, İsmâ'il's memorandum indicate the participation of the Crimean Khan in the upkeep of the Özi fortress complex: on this occasion he had sent a surveyor to Qılburun, which was, "legally," on territory subject to the Crimean Khanate, i.e., on the left bank of the Dnieper (İS.B). Materials for the building works, laborers to undertake them, and money to finance them were then to be mobilized so that the work recommended by the Khan and by İsmâ'il Pasha could begin in spring 1710 (İS.B, İS.C, İS.II).

Some of the matters referred to by Hasan Pasha and İsmâ'il Pasha are echoed in an anonymous treatise hitherto dated on internal evidence to between 1707–8 and 1711;¹⁰⁰ since the author's concerns closely

mirrored those of Hasan Pasha and İsmâ'il Pasha, we may now date it more precisely to 1709–10. The anonymous author is more radical than either Hasan or İsmâ'il, for in a long discussion of how best to fortify not only Özi but also Temrük, a fortress just east of the Strait of Kerch and the Taman Peninsula, he recommends the demolition and complete rebuilding of whole sections of Özi. Among his observations are the following, which we give in paraphrase:

AN.1 The walls of the Main Castle have fallen into ruin over time;

AN.2 The revetments of the ditch have undergone repairs over the last years and are in relatively good shape, but the depth of the ditch itself varies from 7–8 to 9–12 *zirâ'* (5.1–5.8 to 6.6–8.8 m) and is thus uneven: the irregular sections need to be excavated to make it level;

AN.3 The Middle and Lower Castles are overlooked by a place known as Degirmenlik (“a place with mills” or “a millstone quarry”). People within these castles are visible from this place, hence it poses a potential threat that must be neutralized. The author ruminates over two solutions—either to turn the area into an additional fortress or to level somewhat this high ground. He questions the feasibility of both solutions, however, with a stoical reference to the frequently undesirable fate of best laid plans;

AN.4 There is no water in the Main Fortress, and the well water is brackish and undrinkable. Nor are there cisterns, but they can be built and in winter will fill up with rainwater. At present the fortress-dwellers bring drinking water from wells one to two hours away, but these cannot be reached in time of siege. There are two wells in the vicinity of the isolated Fort of Hasan Pasha, but these are used for watering animals: it might be possible to use them for humans, but they would also be hard to reach during a siege;

AN.5 An underground stone masonry armory must be built;

AN.6 A feasibility study has been carried out for the building of seven bastions: once the bottoms of the ditches are made level and their palisades (*şaranpav*) erected, the original walls of the Main Castle will be safe from cannon shot because the bastions and ditches encircle them. The fortress should thus be strengthened, because these walls are old and breached and cannot stand up to cannon shot. Presently there are seven bastion-like structures that were formerly known as “pigpens” (*toñuz tamı*). They were built for musketeers to shoot from and later made even more bastion-like. Because they are already low, their height could easily be reduced further so that

cannons could be set on top of them. However, no more than two cannons could be set on any of them, while usually bastions can take four or five cannons each so that the bastions and the cannons guard one another “scissor-wise,” extensively and strongly;

AN.7 Qılburun is built on sand; it has a palisade around it, but the palanka or fortress (referred to here as both *palanqa* and *qal'e*), is weak. Because the soil is sandy, building a stone structure is undeniably difficult, but if the walls are rebuilt with the aid of beams arranged in a checkerboard framework (*balvanlarıyla şaṭraṅç*)—known as a “framework box” (*çatma şandüq*)—whose lower half is filled with lime mortar and *horāsān*¹⁰¹ and with stone, and whose upper part is filled with sand—and if a palisade is erected around this wall, and the whole fortress made larger, it will become strong.

Like Hasan Pasha and İsmâ'il Pasha, the anonymous author was concerned about the maintenance of the ditch of the fortress, noting that the thin walls of the Main Castle were by now ruined, that cisterns had to be built, and that a dedicated armory was needed. In addition, he listed a concern not expressed by the two pashas, the problem of the elevated place known as Degirmenlik, which was clearly a pressing security concern. In connection with the seven bastions being constructed, the anonymous author supplied the additional information that they had previously been gabions of brushwood filled with earth, used to shield the musketeers from enemy fire.

Neither Hasan Pasha's nor İsmâ'il Pasha's memorandum mentions repairs to Qılburun, but a notice in the register that contains İsmâ'il's refers to fifty wagons ordered from Moldavia to help transport stone and lime for repairs to strengthen Qılburun,¹⁰² confirming that in 1710 repairs under İsmâ'il's auspices were indeed planned there at the same time as the aforementioned work at Özi was to be carried out.

The reference in the anonymous text to the bastions (*tābya*) as being formerly known as *toñuz tamı* is misleading, since it is clear the latter were not standard bastions but raised structures, partly made of gabions, for use by musketeers.¹⁰³ On the other hand, once it is understood that a *toñuz tamı* is a defensive structure built with gabions, rather than a bastion, the nature of the early so-called bastions (*tābya*) built over the last decade of the seventeenth century and first decade of the eighteenth becomes clearer: they seem to have been primitive platforms made of gabions, perhaps not only filled with, but also covered in, earth; if they were suitable for defenders with light fire-

arms, they were certainly unsuitable to support cannons. This information helps explain why there was so much difficulty turning these rudimentary proto- or quasi-bastions into real bastions.

IN PLACE OF A CONCLUSION: RUMINATIONS ON OTTOMAN FORTRESS BUILDING

The foregoing discussion of the Özi fortress complex shows how a dramatic change in the character of the Ottomans' northeastern neighbors called forth a response in the thinking of Ottoman military planners, as the menace of the Ukrainian Cossacks and a risk-averse Muscovy gave way, starting in the late seventeenth century, to the ever-growing threat of the expansive Russian Empire of Peter the Great. In particular, the three memoranda and the treatise that are the focus of our article amply illustrate the very real concerns facing those manning and managing the front line of Ottoman defense in the northern Black Sea region. These four texts and the other documents utilized here allow us to perceive how the form of the Özi fortresses evolved to meet the new circumstances of Russia's southward push and also permit us to comment in some detail on the hitherto barely considered subject of Ottoman fortification techniques. Furthermore, these documents provide material that will eventually enable comparison of Ottoman techniques—at least as practiced in one place and time—with those of contemporary Western fortresses comparable in size and strategic importance.

Working with the main source-type presented here, the new-style Ottoman building register, requires meticulousness and patience as well as imagination and ingenuity. Such work can be most exciting, although exploring these *defters* means coming upon frequent thorny patches and apparent or real impasses. Indeed, mining and making sense of them provide an experience with “pleasures and pains” akin to those of archeology. We even venture to put forward that probing these *defters*, “getting one’s hands dirty” in the texture of a bygone reality, is indeed, as suggested earlier, a kind of virtual archeology. One of the points of this exercise is to demonstrate that such work can help archeologists locate sites or specific parts of them and better identify, analyze, and interpret remnants of infrastructure. On the other hand, no modern-minded historian can deny the intrinsic value of what archeology can offer the historian working on the same time and space. In the present day, “history

begins at Sumer” is no longer a truism, since archeology can no longer be regarded as a mere “ancillary discipline” to text-based history; both are vital components of historical science. Furthermore, data pertinent to the “traditional” pursuits of historians, but which written sources are hardly able to provide, can be exhumed from the ground. We may cite the ancillary historical discipline of metrology, by way of illustration: at least in the Ottoman case this is still at a most rudimentary stage, and we can never be quite certain that we know the actual value of a weight or measure cited in the sources. Yet a juxtaposition of, for example, a measurement found in a *defter* for a ditch, building, or fortress wall, coupled with a measurement taken of the same unearthed structure described in that *defter*, could prove crucial for establishing a reliable value of a given measurement at a given place and time.

A close reading of our documents yields an unanticipated wealth of information on the evolving form and constituent parts of the Özi fortress complex as well as on the construction techniques and materials employed there by the Ottomans. In concluding, we comment on some salient aspects of the information culled from our materials in the context of what is known of Ottoman and Western fortification concepts and praxes in the “Age of Vauban.”

The building registers and other sources relating to construction and repair work at Özi concern a broad variety of elements of this fortress complex: the three main external features—the rampart, the ditch, and the outer palisade—as well as various internal ones indirectly contributing to defense, such as the barrack blocks, the armory, the granary, the cistern, and even the mosque. In order to understand how fortresses became what they were, and to appreciate what they were like to live and work in, it is of course necessary to pay attention to all the different types of structures they encompassed. And we reiterate that the Ottoman building registers, with their rich qualitative and quantitative data relating to materials, labor, and costs, offer future researchers comparable information about various fortresses.

As mentioned earlier, the usage of building terminology is a constant challenge in working with the building registers, at least at this stage of our understanding. In Western fortification terminology “rampart” denotes the main body of a fortress, or its continuous main wall perimeter—the so-called *enceinte*. It has two components: the bastions and the curtains

(walls) connecting them. Though the sample of data for this article is perhaps too small to make quantitative generalizations about the degree to which various parts of the Özi complex required and received attention and resources, we note that our registers record more information on the construction and repair of the bastions than on the curtains.

Perhaps to the besieger on the outside, the bastion differed from the curtain only in its extruding form and the perils it presented in the form of crosswise fire directed at anyone who ventured too close. Beyond form and function, however, how the bastions and curtains at Özi differed from each other in materials and construction techniques is less obvious than the features they had in common. The Özi curtains and bastions were both built up with earth excavated from the ditch, but we do not know whether the techniques of applying the earth or its proportions relative to other materials were significantly different in the two. Secondly, judging by the frequent reference in the documents to the use of timber of various types and in considerable quantity, wood—raw timber and brush as well as dressed lumber—was clearly an important component of both the bastions and the curtains. The sources suggest some differentiation in the application of wood, making reference to beams or other lumber arranged in frames or checkerboard patterns and placed in the foundations or lower portions of both bastions and curtains, presumably for support and to hold the earth together.¹⁰⁴ The bastions, however, seem to have had a more complex structure than the curtains, for we find mentioned in addition wooden latticeworks or basket-like structures—perhaps stout and short gabions, perhaps long and narrow fascines,¹⁰⁵ or perhaps a hybrid of both—installed in them during their construction. Again, our sampling here is clearly too small to allow for generalization concerning differing construction techniques in bastions and curtains; future instances should clarify whether these wooden latticeworks were installed only to protect defenders or also to strengthen the bastion by supporting and keeping the earth together, much like the rebar of the concrete structures of today.

In our overview of Western fortifications we observed that bastions have four sides set at an angle to one another (see fig. 4). They were designed so cannons or musketeers atop the two front sides, called faces, could fire in forwardly directions, while those atop the two rear sides, called flanks, could sweep the area near the curtains and neighboring bastions. It is there-

fore curious that when discussing the placement of cannons on the seven new bastions planned in 1710, İS.2 stipulates that there are to be at least three cannons on each of the bastions' three sides. We cannot be certain whether this is an indication of inferior design (since a three-sided bastion would allow for what was known as "dead ground" towards which sweeping fire could not be directed); a misstatement (i.e., the two front-facing faces, regarded as facing in the same direction, were therefore considered to constitute one side); or a case of design innovation. Further investigation is needed before more can be made of such "three-sided" bastions.

In only one instance (HA.2) is worked stone or masonry (*kārgīr*) mentioned in connection with construction or repairs of the ramparts on the Özi shore of the Dnieper;¹⁰⁶ as we have seen, unworked stone (*taş*) was the main material used at Qılburun. As already noted, an unrevetted earthen rampart was the most resistant to cannon fire, though less so to infantry charge, and far from durable against the elements. Perhaps the ramparts of the Main Fortress and of the Fort of Hasan Pasha were purely earthen, i.e., earthworks, though again, a better sampling is needed before a firm conclusion can be made to this effect. One possibility for the apparently greater use of stone on the Qılburun shore than on the Özi during the Vauban-style modernization of the complex is that earthworks were impractical on the sandy spit, either for lack of sufficient material or because of their lesser durability given the exposure of Qılburun to the waves and spray of the sea and the Dnieper.¹⁰⁷

Although the rampart was the most visible, impressive, and seemingly essential feature of a fortress, our documentation on Özi indicates that as much if not more attention was devoted to the outworks, in particular the ditch and the palisade; the sandy soil of the Qılburun shore of the Dnieper mouth precluded the digging of a ditch, and only the Main Fortress was provided with one.¹⁰⁸ The importance of the ditch was certainly recognized in the contemporary fortress literature: Vauban, for instance, stated that "a good ditch is always the best element in a work of fortification."¹⁰⁹ Perhaps because of the nature of the soil and the climate, revetting both walls of the ditch of the Main Fortress was apparently considered necessary and, in contrast to the rampart, our sources make frequent reference to stone (both unworked and worked) in the context of the ditch. Wood seems to have been less important here, as it is mentioned only once, in

connection with the construction of a scarp revetment (see fig. 5) at the Upper Castle near the barbican, where earth had filled the ditch (İB.1). As already pointed out, it was the ditch that gave builders at Özi the most trouble, thanks to the destructive effects of harsh winter weather and the unforgiving consequences of poor design or construction or both—difficulty most frequently caused by unevenness of the ditch in both width and depth and by fracture or collapse of the revetments.

Almost as much attention was devoted to the palisade built outside the ditch in order to hinder enemy access to the ditch and consequently to the rampart. Vauban stressed the importance of an outer palisade. His comments on the palisade that was part of the line of earthworks made by besiegers to encircle a fortress (the so-called countervallation, which had its own ditch with parapet in addition to the palisade) no doubt apply also to the outer palisade of a fortress:

Whenever possible you should always strengthen the line with rows of stakes in whatever kind of terrain, for the stake is a wonderful device to impede the enemy. It is the cheapest and most effective expedient for preventing the attack of earthworks.... I will not argue the matter of palisading the line, for I consider the palisade quite as imperative as the ditch.¹¹⁰

Normally the palisade would be placed in front of the ditch, as close as possible to the edge of the covered way (a space between the edge of the ditch, or rim of the counterscarp, and the glacis whence musketeers could repel the enemy from approaching the ditch [see fig. 5]). Even at Qilburun, however, where a ditch was impractical if not impossible, a palisade was installed, essentially in place of the ditch, and maintained despite its vulnerability to waves coming in from the sea or the Dnieper; there was also a maintained palisade at the Fort of Hasan Pasha, opposite Qilburun, for which there is no reference to a ditch.

The memoranda of Hasan Pasha (HA.4) and İsmâ'il Pasha (İS.4) both mention a wall made of sun-dried bricks (*kerpiç*) built outside the palisade of the Main Fortress: there was to be a slight gap between this wall and the palisade that would be filled with earth, thereby making them a single, stronger structure. Gauging the optimal gap between these two was apparently a delicate and often frustrating task: İsmâ'il records that because this was not done correctly the wall had to be demolished and rebuilt closer to the palisade—

but not too close. As we have not encountered such a combination of palisade and brick wall in the literature on Western fortresses, we may ask if such a brick-and-earth-reinforced palisade was a peculiar feature with which the Ottomans were experimenting at the time.¹¹¹ Our sources do not reveal the height of the wall, but its likely purpose was to protect the palisade from being smashed by cannon fire: in the fortresses of the Vauban era the stakes of the palisades were only allowed to project 23 to 30 cm above the top edge of the glacis for this very reason. The stakes at Özi seem to have been considerably higher (5 *zirâ'* [3.8 m] according to İB.1) than those of Vauban, which were about 2.7 m (9 ft.) long.¹¹² Perhaps the Ottoman brick-wall-and-earth structure was placed in front to protect excessively protruding stakes.

The already-noted distinction between stone (*taş*) and stone masonry (*kârgir*)¹¹³ is worthy of further elaboration. Of course, the cost of unworked stone is lower, both in terms of the procurement of the raw material and its preparation for use; worked stone is more expensive because not all stone is suitable for working and scarce material tends to be more expensive, while it has the further characteristic that skilled masons must be employed to fashion it for the particular purpose for which it is to be employed. The data presented here concerning the building history of Özi are limited, and it is not possible at this stage to assert that unworked stone and stone masonry each had an allotted place in the construction and repair process, a place determined by the purpose to which each was to be put. As noted, the ramparts of the Özi fortresses appear to have been made of earth (aside from those of Qilburun, whose different environmental conditions made for greater use of stone during this period of reconstruction), and the sole reference to stone in any form is to the use of stone masonry in conjunction with timber framework to raise the height of newly built bastions: perhaps surprisingly, this masonry apparently is to be used *within* the bastions, not on the external face as might be expected (HA.2).

Perhaps a clue to the respective use of stone and stone masonry lies in the more mundane structures at Ozi: a mosque (İS.11) and the houses of the garrison (İS.9) were to be of stone, while the cisterns (HA.10; İS.8) and the new armory (AN.5; İS.7) were to be of stone masonry. What differentiates the latter structures from the former is the necessity that water

not pass through their walls—in the case of the cisterns from the inside out, and for the armory from the outside in. By contrast, it seems that the authorities felt no need to be so exacting when it came to the mosque and the houses. Stone masonry allowed for a more precise fit of one stone beside another, and the gaps between individual stones could be more easily filled to provide a watertight seal than is the case with unworked stone, which by nature is irregular in shape. As we have seen, the place where stone or stone masonry was most liberally used at Özi was the ditch. Given the foregoing we might expect the memoranda to recommend the use of stone masonry rather than stone for lining the ditch, but this is not the case: both stone and stone masonry are recorded to have been used in the ditch, and we are reluctant to suggest why this should be so on the basis of our data at this stage.

To understand and appreciate the challenge of modernizing the extensive Özi fortress complex during the period covered by this article, it is important to be cognizant of the place and role in this project of the original castle complex. Building on or around an old, outdated site presented assets and liabilities: of some of these the authors of our texts were well aware. Aside from providing a base and initial protection during the start of reconstruction and expansion, the old works supplied materials that were scarce in the vicinity of Özi, particularly stone that was probably well suited for recycling. Moreover, there is evidence of a concern to find practical uses for all materials, as in İsmail Pasha's recommendations that all earth excavated from the ditch be put to whatever use necessary, including building up the palisades and erecting stairs and embrasures (İS.6). On the other hand, building atop or around an old structure must have entailed a certain inertia, as in the attempt described in the anonymous treatise (AN) to make larger modern bastions on top of small and primitive ones that seem to have been little more than platforms for musketeers. Another example is the barbican of the Upper Castle, which is mentioned in connection with construction of barracks in 1696, in 1706 (İB.1), and in building registers from years after those we are concerned with here. Judging by the standard literature, the barbican does not figure in contemporary Western European fortifications. Was the Özi barbican, then, a mere remnant, or was it adapted to continue its function of protecting gates or for some other use? It would be

interesting to learn to what extent the architects modernizing a site like Özi were influenced by the features they found in the old complex; were they, for example, tempted to use some of what was already there, and thereby to introduce palliatives rather than solutions, instead of reconstructing in the new style from scratch and without compromise? What is certain from the sources presented here is that there was a good deal of improvisation—which could be either an indicator of a less-than-ideal command of fortress technology or else a sign of adaptability in the face of particular circumstances and material constraints.

The foregoing notwithstanding, the common perception from contemporary times until our own that the Ottomans were ignorant of the science of fortification until enlightened in the late eighteenth century by Westerners such as Baron de Tott¹¹⁴ is not borne out by our analysis. Instead, we find that while the techniques utilized to maintain and improve the fabric of the Özi fortress complex may have differed from those employed in the West, they cannot be considered categorically less (or more) satisfactory in preserving the security of the garrison and townspeople—and, indeed, that of the Ottoman heartland beyond. At all levels those responsible for Özi took advantage as best they could of the resources at their disposal, and given the circumstances facing the Ottomans, rather different from those confronting the defenders of European fortresses around 1700, it would be unrealistic to expect all to adopt similar building practices at equivalent technological levels.

A picture of startling contrasts and ironies emerges from our research into the building history of the Özi fortress complex. Mindful of its distant, desolate, and dangerous setting, in the title of our article we dubbed it an “outpost of empire”; yet there, by reason of necessity, the Ottomans constructed and maintained, first against the Cossacks and then against the Russian Empire, a true “megacomplex.” Throughout the pages of our building registers we learn of the many different human and material costs and challenges that such a site entailed. The picture is far from monolithic, since, alongside evidence of the striking efforts and achievements of those both in Istanbul and on this front line, we are frequently presented with failings and inadequacies—a grand structure beset by shoddiness, miscalculation, and an unforgiving environment. And Özi is but one example of the micro- and macro-historical possibilities that the building

registers offer: the same level of depth and degree of texture is available for practically every site to which these sources apply.¹¹⁵

APPENDIX

Memorandum (*qā'ime*) of İsmā'il Pasha, warden of the Özi fortress complex, with proposals for repairs, 1710

Başbakanlık Osmanlı Arşivi [Istanbul], Maliye Defterleri 3882, pp. 136–37 (fig. 9)

Introductory note: Of the three examples from Ottoman building registers presented in this study, that of İsmā'il Pasha is the most typical, thanks to addenda that follow the main text and continue in the marginalia. In keeping with our aim to concentrate for the time being on aspects relating to construction per se and not its organization, we present only İsmā'il Pasha's memorandum (heading I and its subsections A and 1–13) in full transcription and translation. However, in order to give the reader a firsthand notion of the structure and contents of the building registers, we also provide a summary of the remainder of these two pages, related to materials, labor, financing, and other organizational matters (subsections B and C, heading II and its subsections a-d, as well as the two marginal notes, m1 and m2).

Text and translation of I, A, and 1–13
(p. 136)

İS.I

Text: *berāy-i ta'mirāt-i mevāzi'-i mezkûre der qal'e-i Özi ve Qılburun ki binā ve ta'mir ve termime muhtâc ve muqtezî bûde <ve> [an] ibtidâ'-i evvel-i bahâr-i huçeste-aşâr der sene-i 1122 mübâşeret-i 'Osman Ağâ emîn-i binā ve bi-ma'rifet-i vezîr-i mükerrem İsmā'il Paşa muhâfız-i qal'e-i Özi binā ve ta'mir ve tekmil şüde fermüde ber müceb-i hulâşa-i qā'ime-i i'lâm-i vezîr-i müşârûn ileyh ve telhîs ve fermân-i 'ālî fi 25 z sene 1121 qayd ve şüret dâde fermüde.*

Translation: For the repairs of the places mentioned [below] in the fortress [complex] of Özi and Qılburun that are in need and in requirement of [new] construction or repair, [starting] from the beginning of spring, auspicious in signs, of the year 1122 (March 1709–March 1710) [through] the agency of 'Osman Aga, the building commissioner (*emîn-i binā*), and with the [benign] intervention (*ma'rifet*) of the honored vizier İsmā'il Pasha, warden of the fortress of Özi, construction and repair and completion were ordered.

[This was done] in accordance with the summary of the memorandum¹¹⁶ (*qā'ime-i i'lâm*) of the aforementioned vizier and the summary [of the memorandum made for the grand vizier or sultan] (*telhîs*) and the [consequent] imperial order (*fermân-i 'ālî*). On 25 Dhu 'l-Hijja 1121 (February 25, 1710) it was ordered that [these] be registered [in the *defter*] and a copy (*şüret*) made.

İS.A

Text: *Özi qal'esi muhâfazasında olan vezîr-i mükerrem İsmā'il Paşa tarafından gelen qā'imesi mücebince qal'e-i mezbûrûn ta'mir olunacaq mahallerinüñ hulâşasıdır.*

Translation: In accordance with the memorandum that came from the honored vizier İsmā'il Pasha, who is the [holder] of the wardenship of the Özi fortress, [this is] the summary of the places of the aforementioned fortress that are to be repaired.

İS.1

Keywords: *esās* (foundation), *handaq dīvâr* (stone masonry revetment of ditch), *temel* (foundation), *beden dīvâr* (rampart, “main wall”).

Text: *Tülen altı-yüz ve ma'a esās qadden on iki arşun olmaq üzere yüz yigirmi bir senesinde İsmā'il Ağa mübâşeretiyile müceddeden binā olunan kârgîr handaq dīvârınun elli arşun temeli çatlamaq ile bozulub tekrâr yapılmaga muhtâc olduğundan ma'-adâ dīvâr-i mezbûr yufqa ve doğru binā olunmaqla ekser mâhalli handaq içine meyl eylemiş ve beden üzerinde olan toprağın devrilmemesine mübâşeret olunub toprağı dīvâr üzerine vaz' olunmaqla başlandığı gibi tahammül edemeyüb handaq içine meyl ve yıqılmağa yüz tutmaqla handaqdan çıkan topraq beden dīvârları üzerine vaz' ve tesviye olunduğda mütehammül olmayub hâliyə çatlayan mahallinden gayrî bir vâfir yeri dağı yıklub müceddeden binā olunmağa iqtizâ eylemek ihtimâli olmaqla iqtizâyı üzere ta'mir u tekmil olunmaq.*

Translation: A fifty-*arşun* stretch of the foundation of the revetment of the newly constructed stone masonry-faced ditch six hundred *arşuns* long and with a height, including its base (*esās*), of twelve *arşuns* that through the agency of İsmā'il Ağa was being reconstructed in [1]121 (March 1709–March 1710) has cracked and become ruined and needs to be built again. Besides this, as the aforementioned revetment (*dīvâr*) was built thin and perpendicular,¹¹⁷ most of its places have begun to lean over upon themselves, and because earth [from the ditch] is being deposited on top of the rampart (*beden*) it cannot bear weight as it could when [this work] was started. Because it

began to lean into the ditch and collapse when earth removed from the ditch was placed upon the rampart (*beden dīvārları*) and made level, the rampart could not carry [the weight], and now, aside from the cracking places [of the revetment], a good number of places have been demolished, and since there is a possibility of doing the required building work anew, [it is proposed] to do the repairs and complete [the ditch] as necessary.

İS.2

Keywords: *handaq, tābya*

Text: *Handaq-i mezbūruñ üzerinde müceddeden binā olunan yedi ‘adet tābyalaruñ qaddı nā-tamām olub dörder ve beşer arşun irtifā’en qadda muhtāç olduğından ğayrī zıkr olunan tābyalaruñ esāsları küçük vaz’ olunmağla ‘ādeta yuqarusı daħi devşirimli olub itmām bulduqda üçer ve dörder pare topa mütehammil olmamağla üç tarafınuñ her cānibine aqall mertebe üçer pare top vaz’ olunacaq miqdār iqtizāsına göre tevsi’ ile qaddları irtifā’ olunmaq.*

Translation: The height (*qadd*) of the seven bastions (*tābya*) being newly built upon the aforementioned ditch is not yet full: four or five *arşuns*’ height are needed for each. Besides this, because the foundations of the bastions were laid too small, once their upper parts are well built and completed, they will not [even] be able to bear three or four cannons each. Because of this [it is proposed] to increase their height and widen them in accordance with the necessity that at the very least three cannons [can] be positioned on each of the [bastions’] three sides.

İS.3

Keywords: *kārgir handaq dīvārı, etekiyye* (skirt)

Text: *Özi qal’esi bir tarafı yüksege vāqi’ olub muhāfız-i sâbıq İbrāhīm Paşanuñ binā eyledüğü kārgir handaq dīvārınuñ iki tarafından suya varınca etekiyye olan mahallinün tūlen iki yüz arşun miqdār qaddı noqsān yapılmamağla dörder ve beşer arşun daħi qaddınuñ irtifā’ olunmaq.*

Translation: One side of the [Main] Özi Fortress is high;¹¹⁸ because the height of a stretch of two hundred *arşuns* of the place that forms the skirt (*etekiyye*)¹¹⁹ for the stone masonry revetments of the ditch that the previous warden (*muhāfız*) İbrahim Pasha built—both ends of which approach the water¹²⁰—is defectively constructed, [it is proposed] to increase the height [of the skirt] by four to five *arşuns*.

İS.4

Keywords: *handaq, arşun, şaranpav, kerpiç, topraq*

Text: *Zıkr olunan handaquñ taşradan etrāfına bin toquz yüz seksen arşun yeri ‘adet üzere qal’enuñ setr ve hıfzı için naşb olunan şaranpavuñ önüne binā olunan kerpiç dīvārınuñ üzerine vaz’ olunacaq topraq henüz vaz’ olunmaduğından ma-‘adā şarampava mülāsıq binā olunmağla ayaq erişmeyecek qadar şaranpavdan alarğa binā olunmaq münāsib olmağla bu daħi bozulub bir miqdār girüden binā olunmaq iqtizā ve beraberliğine vaz’ı iqtizā eden topraq dolmaq.*

Translation: The earth to be placed upon the sun-dried brick (*kerpiç*) wall built in front of the palisade (*şarampav*) [of the Main Fortress] customarily erected for screening and protecting a fortress, which is outside and around the mentioned ditch for a length of one thousand nine hundred eighty *arşuns*, has not yet been put in place. Besides this, because [the wall] was built adjoining the palisade—it is considered suitable to build it no more than a foot beyond (*alarğa*) the palisade—this [wall] has to be demolished and [re]built [only] slightly behind [the palisade]¹²¹ and [the gap] filled with earth, packing [the wall and palisade] together.

İS.5

Keywords: *handaq, handaquñ ‘umqı, tesviye, tathir, qadd, taş, çamur, handaq dīvārı*

Text: *Zıkr olunan cedid handaquñ ‘umqı tesviye ve tathir olunduğdan soñra taşra tarafına da’iren mā-dār tūlen bin dört yüz seksen arşun ve qadden on iki arşun taş ve çamur ile müceddeden iqtizā eden handaq dīvārı henüz yapılmamağla binā olunmaq.*

Translation: The bottom of the mentioned new ditch was made level and cleaned out. After [this], since the [counterscarp] revetment (*handaq dīvārı*) that was required to be made anew with stone and mud to a length of one thousand four hundred eighty *arşuns* and at a height of twelve *arşuns* around the outside [of the ditch] has not yet been made, [it is proposed] that it be built.

İS.6

Keywords: *handaq, şaranpav, metris basamaqları, tūfengçi mazğalları, tābya, sepet, çatmalar*

Text: *Handaqdan çıkan topraq vāfir olup bir yere yerleşmemekle lāzım gelen mahallere naql ve düzlenüb iç tarafından ardına iqtizā eden şaranpavlar dizildüğüden soñra metris basamaqları ve tūfengçi mazğalları ve tābyalaruñ qaddları irtifā’ı ve sepet yerine çatmalar yapıdurulmaq.*

Translation: Because the earth removed from the ditch

is much, and because it is not being deposited anywhere else, after it is moved to necessary places and made level, and the necessary palisades are placed behind it from the inside [for support,¹²² it is proposed that] trench stairs (*metris başmaqlar*)¹²³ and embrasures for the musketeers (*tüfengçi mazgalları*) be made and that the height of the bastions be increased and [wooden] frameworks be placed where [there are to be] gabions (*sepet*).¹²⁴

İS.7

Keywords: *cebeḥāne mühimmatı, qulle, barut, kârgir cebeḥānesi, cebeḥāne*

Text: *Özi qal'esinde olan cebeḥāne mühimmatı qullelerde ve barutı daḥi qullelerin altında hıfz olunub bir mahfı yerde kârgir cebeḥānesi olmamağla barut hıfz-ıçün bir münāsib ve mahfıce mahallde kârgir cebeḥāne binā olunmaq.*

Translation: The ordnance in the Özi fortress is protected in the towers,¹²⁵ and as for the gunpowder, it is stored under these towers. Because there is no stone masonry armory in a concealed place [it is proposed] to build a stone masonry armory for the protection of the gunpowder in a suitable and concealed place.

İS.8

Keywords: *kârgir şahrınç (şarnıç)*

Text: *qal'e-i mezbūruñ suları bir ve bir bucuq sâ'at yerden taşradan gelüb hın-i iqtizāda bir vech-le alınmaq mümkün olmadıḡı zāhir olmağla münāsib olan mahallde bir iki kârgir şahrınç binā olunmaq.*

Translation: Because the water of the aforementioned fortress comes from outside, from a place one [to] one and a half hours away, and it has become evident that in time of need it would be impossible to have it brought in any way, [it is proposed] to build two stone masonry cisterns in a suitable place.

İS.9

Keywords: *ḥandaq, tābya, yalın qat dīvār, ḥandaq dīvārı, taş, muḥāfizci suknāları*

Text: *Özi qal'esi qadimden ḥandaqsız ve tābyasız yalın qat dīvār olub muqaddemā iqtizā ḥasbi-yle etrāfına bir küçük ḥandaq ḥafır ve bir qaç şaḡir tābya binā olunub ḥalā ḥafır olunan cedīd ḥandaq ve binā olunan tābyalar daḥi ol 'atıq ḥandaq ve tābyalar etrāfına ve önlerine vāqı' olub bir vech-le lüzümları olmayub ve tazıyq-i qal'eden ḡayrı bir fā'idesi melḥūz olmamağla doldurulub ḥandaq-i mezbūr dīvārından ve tābyalarından ḥāşıl olunan taş iqtizā eden bināya şarḡ ve bu taqrīb ile qal'eye vūs'at gelmekle yerine iqtizā eden muḥāfizci suknāları binā olunmaq.*

Translation: The Özi castle was formerly without ditch or bastions and with a wall of single thickness. Previously, in accordance with requirements, around it a small ditch was dug and some small bastions were built. As for the new ditch that has now been dug and the bastions that have now been constructed, because they were built around and in front of the old ditch and bastions, [these latter] have no use whatsoever. Apart from [bringing] difficulty to the castle, they have no anticipated use. They should be filled in and the stone obtained from the [revetment] wall of the aforementioned [old] ditch and bastions be used in the needed construction, and since according to this estimation there will be more than enough, the surplus should be used to build dwellings for the defenders.

İS.10

Keywords: *taḥta örtülü taş qulle, tābya*

Text: *zıkr olunan 'atıq qal'e dīvārı üzerlerinde üzerleri taḥta örtülü on üç 'adet yüksek taş qulle olub hın-i iqtizāda ḥalqa serpindisinden ve mazarratından ḡayrı menfa'ati müşāhede olunmamağla qal'e dīvārı beraberliğine degin yıqılub ve üzerleri düzlenüb tābya mişillü üzerlerine birer qaç şāḥi top vaz' olunmaq.*

Translation: There are thirteen high stone towers topped with wooden roofs atop the wall of the mentioned old castle.¹²⁶ Other than the scatter of debris (*serpindi*) and [other] harm (i.e., harm to the residents from falling debris), these now have no use and [it is proposed] that they be demolished down to the level of the castle walls and their tops flattened and on each of these [now] bastion-like structures some light cannons (*şāḥi top*)¹²⁷ be placed.

İS.11

Keywords: *cāmi'-i şerif, qulle, tavān, örtü, kerāste*

Text: *Özide bir mu'ayyen cāmi'-i şerif olmayub iki mahallde qulleler içinde edā-yi şalavāt olunub otuz adamdan ziyāde sıḡmamağla 'ideynde ve cum'alarda 'azim siqlet¹²⁸ ve zahmetden ḥālī olmamağla vūs'atlice bir cāmi'-i şerif ziyāde muqtażā olmağla otuz arşun tūli ve yigirmi arşun 'arzu binası münāsib görülen mahallde cāmi'-i şerifün iqtizāsına göre dört dīvār taş ile irtifā' bulduqdan şoñra tavānı ve örtüsü kerāsteden olmaq üzere binā olunmaq.*

Translation: There is no specially designated mosque at Özi, and [so] prayers are conducted within towers in two [separate] places. However, as no more than thirty men [altogether] can fit inside [them], there is no lack of hardship and difficulty on the two 'ids¹²⁹ and on Fridays. Hence, because a spacious mosque

is much needed, [it is proposed] that, in accordance with the requirements, a mosque be raised in a suitable place, thirty *arşuns* long and twenty *arşuns* wide (22.5 x 15 m), with four stone walls, and that a ceiling and roof of timber then be built.

İS.12

Keywords: *enbār, keşf, qulle*

Text: *Özi qal'esinde seksen bin kīle miqdārın zahāre istī'āb eder enbār yapılmıq üzere keşf olunmağ fermān olunub lākin hālā qal'e-i mezbūrede zahāyir vaz' olunacağ bir qaç boş qulle olmağla ancağ yigirmi bin kīle zahāyir alur enbār kifāyet edeceğ i'lām olunmağla vech-i meşrūh üzere münāsib olan mahallde müceddeden enbār binā olunmağ.*

Translation: It was ordered that an appraisal [for the feasibility] of building a granary with a capacity of eighty thousand *kīles* (2,048,000 kg)¹³⁰ be undertaken. However, currently there are several empty towers in the castle where grain could be placed, but it has been made known that they would be sufficient to serve in the capacity of a granary for [only] twenty thousand *kīle* (512,000 kg) of grain. Hence, in the aforementioned manner, a granary should be newly built in an appropriate place.

(p. 137)

İS.13

Keywords: *hāne* (house), *ev* (house), *qonaq* (residence)

Text: *Özide muhāfiz olanlar ve etbā'larınıñ sākın olacağ bir mu'ayyen mahalli olmayub qal'e ahālisi fuqarāsımuñ 'iyālını iħrāc ve hānelerin taħliyye ile sākın olub lākin zayğ yer olmağla evleri az ve küçük olub yerleşmekde muhāfiz olanlar ve hem qal'e sükkānı fuqarāsı meşaqat-i 'azīm çekmeleriyle fuqarāyı qonağ zahmetinden taħlīs için fi-mā-ba'd muhāfiz olanlar etbā'lariyla sākın olmağ için münāsib olan mahallde bir mu'ayyen qonağ yapıdurılmağ.*

Translation: There is no designated place for the defenders (i.e., the garrison troops) of Özi and their dependents to dwell in, [and so], with the expulsion of the households of the wretched fortress inhabitants and the vacating of their homes, [the defenders] are dwelling in [these houses]. [However,] because [available] space is tight, and their houses are few and small, both the defenders settling [in them] and the wretched fortress inhabitants suffer great difficulties. In order to release the wretches from their housing difficulties hereafter [it is proposed] that residence[s] be built in an appointed place [for] the defenders to live with their dependents.

Summary of untranscribed and untranslated portions (see facsimile)

İS.m1 (p. 136): A record of 150 silver piasters¹³¹ (*ğuruş-i esedī*) being issued for the travel expenses of 'Osman Aga during period of Özi repair.

İS.B (p. 137): Crimean Khan¹³² and Ebu Bekir Aga arranged for an appraisal (*keşf*) of repairs necessary for the restoration and strengthening of Qılburun.

İS.C (p. 137): In accordance with the summary of vizier İsmā'il Pasha's memorandum (*qā'ime*) and the appraisal of Qılburun carried out through offices of the Crimean Khan, workers (*'amele, ırgad*), wagons (*'araba*), timber (*kerāste*), nails (*mesāmīr*), pig iron (*āhen-i hām*),¹³³ and other supplies should be carried by oared ships (*çekdürür sefīneleri*), so that in this year no defects remain at Özi and Qılburun and these fortresses become strong; starting in the spring İsmā'il Pasha is to act to bring about this work; 'Osman Aga has been appointed building commissioner (*emīn-i binā*) so that as workers perform their service their wages and other expenses will be seen to; he and İsmā'il Pasha are each to receive one copy of the relevant sections of this register of the "chief account" (*defter-i baş muhāsebe*) and one copy of the orders issued for the complete repair of the necessary places; orders that such a procedure be followed were given out on 27 Dhu 'l-Hijja 1121 (February 27, 1710).

İS.II (p. 137): The number of carpenters (*neccārān*) from the following districts (*qazā*):

- Baba Tagı: 20 carpenters
- Şumni: 10 carpenters
- Hırsova: 10 carpenters
- Silistre: 20 carpenters

(Also given are details of their wages: number of days paid for, rates, source of funds, totals).

İS.m2 (p. 137): The record of an order issued to the *qāđi* of Baba Tagı and local cavalry commander (*kethüdā yeri*), and to the local janissary commander (*yeñiçeri serdārı*), to arrange for dispatch and salaries of carpenters for the current year's repairs at Özi, 18 Dhu 'l-Hijja 1121 (February 18, 1710).

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NOTES

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1. In this article we maintain a distinction between “medieval”-style castles with high and thin walls, and the “modern” fortresses with low and thick ramparts that succeeded them. Further discussion of this distinction is provided below. In both contexts, we use “fort” to denote smaller fortifications.
2. Evliya Çelebi, *Evliya Çelebi Seyahatnâmesi*, 8 vols. (Istanbul: Yapı Kredi Yayınları, 1996–), vol. 5: *Topkapı Sarayı Bağdat 307 yazmasının transkripsiyonu–dizini*, ed. Yücel Dağlı, Seyit Ali Kahraman, and İbrahim Sezgin (2001), 94.
3. On the Black Sea as an Ottoman *Mare nostrum*, see Victor Ostapchuk, “The Human Landscape of the Ottoman Black Sea in the Face of the Cossack Naval Raids,” *Oriente Moderno* 20 n.s. (2001): 23–95, esp. 27–37.
4. I.e., of the Zaporozhia region—the area of the lower Dnieper below a series of cataracts in the river south of the modern city of Dnipropetrovsk and north of the modern city of Zaporizhia. (In 1932 this section of the river was completely flooded by the construction of a giant hydroelectric dam.) The Ukrainian Cossacks in general are often referred to as Zaporozhian Cossacks, but in fact the latter were a distinct subgroup and, because they were the furthest out on the frontier, the most prominent throughout most of the Cossack era. There were, however, other significant subgroups concentrated in towns throughout central, eastern, and southern Ukraine who were also active in Ottoman and other wars as well as in raiding activity.
5. In English, as in Turkish, “palanka” (Ottoman: *palanqa*) refers to a fort consisting of palisades buttressed or reinforced with earth (sometimes called a stockaded fort or simply a stockade). In the eighteenth century, however, the word could apparently also refer to a more “modern” fort of stone (unworked or worked) or brickwork that was perhaps built in place of an original palanka. Thus we will see the eighteenth-century fort of Qilburun referred to as both a *palanqa* and a *qal'e*, though clearly by then it was no longer a purely palisaded structure.
6. Evliya Çelebi provides the fullest known description of the Özi fortress complex, as he does of very many places in the Ottoman Empire of the mid-seventeenth century. Even though his report is invaluable—and we will fully analyze it in a separate study of Özi prior to the 1690s—we have determined on the basis of documentary sources that several points of his account, particularly with regard to the names he assigns to the various castles of the complex, are quite problematic. On the construction work carried out at Özi by Hasan Pasha in the late 1620s and problems of identifying its castles, see Victor Ostapchuk, *Warfare and Diplomacy across Sea and Steppe: The Ottoman Black Sea Frontier in the Seventeenth Century* (Cambridge, MA: Harvard Middle Eastern Monographs, forthcoming).
7. Located on the west side of the town, this remnant, known as the “Turkish Rampart,” is 160 m long and 3–5 m high. The team of Ukrainian and Turkish archeologists headed by Dr. Svitlana Biliaieva detected four separate building phases; the lower three strata are of unbaked brick and are considered by the team possibly to belong to the Ottoman period: Svitlana Biliaieva [Biliaieva], “Ochakiv'deki Türk şehrinde arkeolojik araştırmalar,” *Uluslararası Dördüncü Türk Kültürü Kongresi: Bildirileri, 4–7 Kasım 1997, Ankara*, 1 (Ankara: Atatürk Kültür Merkezi Başkanlığı, 1999), 109–14; Valentyna Korpuseva and Iryna Vitryk, “Doslidzhennja dav'n'oho valu Ochakova,” *Novi doslidzhennja pam'jatok kozats'koji doby v Ukrajinu: Zbirka naukovykh statej* 6 (1996): 44–45.
8. On Ottoman attitudes and actions vis-à-vis the Black Sea steppes, see Ostapchuk, “Human Landscape of the Ottoman Black Sea,” 30–33.
9. Başbakanlık Osmanlı Arşivi (Prime Ministry Ottoman Archive).
10. Several groundbreaking studies of Ottoman building history have utilized these sources. Especially worth noting are Zeynep Nayır, *Osmanlı mimarlığında Sultan Ahmet külliyesi ve sonrası (1609–1690)* (Istanbul: İTÜ Mimarlık Fakültesi, 1975); Gülru Necipoğlu, *Architecture, Ceremonial, and Power: The Topkapı Palace in the Fifteenth and Sixteenth Centuries* (Cambridge, MA and London: MIT Press, 1991); and Pia Hochhut, *Die Moschee Nuruosmaniye in Istanbul: Beiträge zur Baugeschichte nach osmanischen Quellen* (Berlin: Klaus Schwarz Verlag, 1986).
11. Here we can only conjecture that the aim of the reorganization was to allow the finance department to better control the utilization of funds disbursed for infrastructure projects all over the empire by providing its officials with detailed information concerning assignment, transfer, and accounting of funds and also including substantive documentation on construction and repair projects—the causes that necessitated them, special or unusual circumstances, plans and problems of execution, etc.—that would make misuse or embezzlement of funds less likely. Hence there is frequent reference to the *baş muhasebe*, or the empire’s “chief account,” and, moreover, these registers were required to be checked, stamped, and deposited in the office of the chief account (e.g., MAD 3882.137, 141, 152, 336; MAD 4355.278, 281, 287, 290). In working with these registers, one is constantly reminded of the degree to which decision-making in the Ottoman Empire—even in the eighteenth century, the so-called “age of decentralization”—was still centralized, at least in this sphere of activity; even minor decisions and proposed expenditures were routinely submitted to the *Mâlîyye* for approval: see, for example, the marginal note İS.m1 in the Appendix, where a seemingly insignificant travel expense is approved at the center.
12. Element 2 predominates in the documents that we focus on in this study (figs. 7, 8, 9), though element 3 can be seen at the bottom of fig. 9b (parts a, b, c, and d).
13. Nayır’s study of seventeenth-century royal mosque complexes (*külliyes*) uses, among other sources, registers from

- the Topkapı Palace Archive that the author also refers to as “building registers” (*inşa’at defterleri*). It is clear that these *defter*s are primarily expenditure books (*maşraf defterleri*) concerned with material and/or labor costs, but since they were written before the bureaucratic reorganization effected towards the end of the seventeenth century they are not comparable with those we discuss here: Nayır, *Sultan Ahmet külliyesi*, 38, 88–112, 115–16. Though we have not had the opportunity to see these materials because of the difficulties of access at the Topkapı Palace Archive, on the basis of Nayır’s use of and comments about the *maşraf defterleri* we are relatively confident of their non-descriptive content and incomparability with what we have here designated as “building registers”; a source analysis of these early construction-related *maşraf defterleri* is overdue. Judging by its name, Topkapı D. 10146, which Nayır refers to as a *keşf defteri*, is apparently an exception that seems to be similar to the registers we are considering here, but since her study only lists it and does not specifically refer to its contents, we cannot determine them: *ibid.*, 116. We suspect that the label *keşf defteri* stems from the archival fiche describing the *defter*, rather than being the name of a specific early-seventeenth-century *defter* type or even a phrase present in the text; among the large number of fifteenth- through nineteenth-century *defter*s utilized by Necipoğlu, this label only applies to those written after the seventeenth century (Necipoğlu, *Topkapı Palace*, 305–7). The archival base of Hochhut’s study of the construction of the Nuruosmaniye mosque consists mainly of financial documents from the Topkapı similar to those of Nayır; even though this study relates to the eighteenth century, it does not utilize or mention the types of building register produced by the bureaucratic reorganization: Hochhut, *Die Moschee Nuruosmaniye*.
14. Some *defter*s listing materials, with or without cost figures, were apparently drawn up for inventory purposes and in more direct connection with the construction work at hand; any possible distinctions between such *defter*s and other financial registers remain to be worked out for all periods.
 15. Muzaffer Erdoğan, “Osmanlı mimari tarihinin arşiv kaynakları,” *Tarih Dergisi* 3 (1951–52 [1953]): 95–122. Erdoğan has also given a basic description of these *defter*s and further examples in “Osmanlı mimarisi tarihinin antik yazma kaynakları,” *Vakıflar Dergisi* 6 (1965): 111–36, esp. 120–36. Paraphrases as well as full texts of a number of excerpts from such *defter*s for various types of construction works, including some fortresses of the Black Sea region, are to be found in his monograph devoted to a chief imperial architect (*hâşşa baş mi’mârî*) during the so-called “Tulip Age” of the early eighteenth century: Muzaffer Erdoğan, *Lâle Devri Baş Mi’marî Kayserili’li Mehmed Ağa* (Istanbul: İstanbul Fetih Cemiyeti, 1962), 84–107.
 16. Nejat Göyünç, “The Procurement of Labor and Materials in the Ottoman Empire (16th and 18th Centuries),” *Colloques internationaux du CNRS, Économie et Sociétés dans l’Empire Ottoman (fin du XVIIIe–début du XXe siècle): Actes du colloque de Strasbourg, 1er–5 juillet 1980, Congrès d’Histoire Economique et Sociale de la Turquie* (Paris: Editions du CNRS, 1983), 327–33; for the strategic importance of and the reasons for the construction of Acı, see Silahdar Fındıklılı Mehmed Ağa, *Nusretnâme*, ed. İsmet Parmaksızoğlu, 2 vols. (Istanbul: Milli Eğitim Bakanlığı, 1962), vol. 1, 232, 251–52.
 17. Rhoads Murphey, *Ottoman Warfare, 1500–1700* (London: UCL Press, 1999), 115–21 is a rare discussion of this subject in the context of Murad IV’s siege of Baghdad in 1638.
 18. A recent dictionary of Ottoman construction works and building materials terminology compiled by Neslihan Sönmez, while an important contribution, is of limited utility here, since military architecture is beyond its purview. Although the dictionary notes the existence and wealth of data in the building registers, including those produced after the bureaucratic reorganization just prior to 1700, it does not draw on them: Neslihan Sönmez, *Osmanlı dönemi yapı ve malzeme terimleri sözlüğü* (Istanbul: Yem Yayın, 1997).
 19. Invaluable for more precisely ascertaining the meaning of Ottoman technical terms relating to parts of fortresses and construction tools and techniques are eighteenth-century Ottoman translations of the works of Sébastien Le Prestre de Vauban, Louis XIV’s master of the new-style fortresses; for reference to his contribution to the science of fortification, see below. A comparison of the Ottoman versions with the French originals provides insight into Ottoman terms that are completely obscure or unreliably defined in the Ottoman dictionaries, but whose French equivalents are better understood. For a guide to the various Ottoman translations of Vauban’s works, see Ekmeleddin İhsanoğlu, Ramazan Şeşen, M. Serdar Bekar, and Gülcan Gündüz, eds., *Osmanlı askerlik literatürü tarihi = History of Military Art and Science Literature during the Ottoman Period*, 2 vols. (Istanbul: IRCICA, 2004), vol. 1, 44–47.
 20. In addition to the excavation reports cited in n. 7, see Svitalana Biliaieva [Biliaieva], “Poperedni pidsumky rozkopok Ochakova u 1995 r.,” *Novi doslidzhennja* 6 (1996): 40–42; S. O. Biliaieva, L. I. Vynohrods’ka, O. B. Sukhobokov, and B. Ersoy, “Arkeolohichni doslidzhennja v Ochakovi,” *Arkeolohichni vidkryttja v Ukraïni 1997–1998* 1 (1997–98): 55–57.
 21. M. Kiel, S. Ghafour, and Th. Robinson, “Gazi Turhan Bey,” CD-ROM. See also Machiel Kiel, “Das Türkische Thessalien, Etabliertes Geschichtsbild versus Osmanische Quellen: Ein Beitrag zur Entmythologisierung der Geschichte Griechenlandes,” *Abhandlungen der Akademie der Wissenschaften in Göttingen, Philologisch-Historische Klasse, Dritte folge*, 212 (1996): 109–96.
 22. Lucienne Thys-Şenocak, “The Architectural Survey of the Ottoman Fortresses of Seddülbahir and Kumkale,” *Bulletin (Fondation Max Van Berchem)* 15 (Dec. 2001): 4–7; *idem*, “The Ottoman Fortresses of Seddülbahir and Kumkale” (appeared in Turkish as “Kumkale ve Seddülbahir Osmanlı Kaleleri”), *Cogito* 28 (2001): 274–82. Chap. 3 of Thys-Şenocak’s forthcoming monograph, *Ottoman Women Builders: The Architectural Patronage of Hadice Turhan Sultan* (Aldershot, UK and Burlington, VT: Ashgate Press, 2006), is devoted to the building history of these fortresses. See also: www.seddulbahir-kumkale.com.
 23. A notable exponent of this approach has been Gülru Necipoğlu in her study of Topkapı Palace (see n. 10, above), where her re-creation of the fabric of the complex is in part based on a variety of archival and other documents.
 24. E.g., David Austin and Leslie Alcock, eds., *From the Baltic to the Black Sea: Studies in Medieval Archaeology* (London and Boston: Unwin Hyman, 1990), chaps. 1–3.
 25. Timothy Insoll, *The Archaeology of Islam* (Oxford and Malden, MA: Blackwell Publishers, 1999), 6.

26. Insoll, *Archaeology of Islam*, 3–7.
27. Uzi Baram, “The Complexities of Modernity in the Middle East: Historical Archaeology and Its Contributions,” unpublished paper delivered at World Archaeological Congress 5, Washington, DC, June 21–26, 2003: p. 5 (cited with permission of the author).
28. Baram, “Complexities of Modernity,” 5.
29. Ibolya Gerelyes and Gyöngyi Kovács, eds., *Archaeology of the Ottoman Period in Hungary: Papers of the Conference Held at the Hungarian National Museum, Budapest, 24–26 May 2000* (Budapest: Hungarian National Museum, 2003).
30. József Laszlovszky and Judith Rason, “Post-medieval or Historical Archaeology: Terminology and Discourses in the Archaeology of Ottoman Period,” in Gerelyes and Kovács, *Archaeology of the Ottoman Period in Hungary*, 377–82, esp. 378.
31. Uzi Baram and Lynda Carroll, eds., *A Historical Archaeology of the Ottoman Empire: Breaking New Ground* (New York, Boston, Dordrecht, London, and Moscow: Kluwer Academic, Plenum Publishers, 2000); in the introduction, co-authored with Lynda Carroll, Baram addresses themes similar to those he takes up again in his “Complexities of Modernity” paper. See the review by Scott Redford in *Bulletin of the American Schools of Oriental Research* (May 2002): 101–103, which also notes the scant attention paid to the physical remains of the Ottoman period.
32. Baram and Carroll, *Historical Archaeology of the Ottoman Empire*, 16.
33. *Ibid.*, viii, 20, 141, 163.
34. Peter Ian Kuniholm, “Dendrochronologically Dated Ottoman Monuments,” in Baram and Carroll, *Historical Archaeology of the Ottoman Empire*, 93–137.
35. Alison B. Snyder, “Transformations, Readings and Visions of the Ottoman Mosque,” in Baram and Carroll, *Historical Archaeology of the Ottoman Empire*, 219–43.
36. Uzi Baram, “Entangled Objects from the Palestinian Past: Archaeological Perspectives for the Ottoman Period, 1500–1900,” in Baram and Carroll, *Historical Archaeology of the Ottoman Empire*, 137–60. Incidentally, one of the richest collections of Ottoman pipes has been gathered in the various digs at Özi: Biliaieva et al., “Arkheolohichni doslidzhennja v Ochakovi”; idem, “Ochakiv’deki arkeolojik araştırmalar.”
37. Insoll, *Archaeology of Islam*, 5.
38. Namely, as late as 1676 the Venetian *bailo* in Istanbul, Giacomo Quirini, discussed the potential danger that the Cossacks represented to the Ottomans in the Black Sea: Dariusz Kołodziejczyk, *The Ottoman Survey Register of Podolia (ca. 1681): Defter-i Mufasssal-i Eyalet-i Kamaniçe* (Cambridge: Harvard Ukrainian Research Institute and Kiev: Institute of Oriental Studies, 2004), 4.
39. See D. I. Javornyts’kyj, *Istoriya zaporiz’kykh kozakiv*, vol. 3 (Lviv: Vydavnytstvo «Svit», 1992, orig. publ. in Russian in 1892–1897); O. M. Apanovych, *Zaporiz’ka Sich u borot’bi proty turets’ko-tatars’koi ahresiji* (Kiev: Vydavnytstvo Akademiji nauk Ukr. RSR, 1961).
40. William C. Fuller, *Strategy and Power in Russia, 1600–1914* (New York and Toronto: Free Press, 1992), p. 137.
41. We have had such frequent recourse for our understanding of European fortifications to Christopher Duffy’s useful and authoritative volumes that we have not cited them on each occasion. They are *Fire and Stone: The Science of Fortress Warfare, 1660–1860* (Newton Abbot: David and Charles, 1975), and *Siege Warfare*, vol. 1: *The Fortress in the Early Modern World, 1494–1660* and vol. 2: *The Fortress in the Age of Vauban and Frederick the Great, 1660–1789* (London: Routledge and Kegan Paul, 1979–85).
42. Duffy, *Siege Warfare*, vol. 1, 2.
43. Kathryn M. Ebel, “City Views, Imperial Visions: Cartography and the Visual Culture of Urban Space in the Ottoman Empire, 1453–1603” (Ph.D. diss., University of Texas, 2002), 6–7.
44. Prior to this, we only know of symbolic representations of Özi that clearly bear little or no relation to the actual stronghold. E.g., see the old Ottoman maps of the Dnieper region published in İsmail Hakkı Uzunçarşılı, *Osmanlı tarihi*, 4 vols. (Ankara: Türk Tarih Kurumu, 1947–59), vol. 4, pt. 1 (1956), fig. 7; and in Alexandre Bennigsen, Pertev Naili Boratav, Dilek Desai, and Chantal Lemercier-Quelquejey, eds., *Le Khanat de Crimée dans les Archives du Musée du Palais de Topkapı* (Paris and The Hague: Mouton, 1978), 70–80.
45. Baron Christoph Hermann von Manstein, *Memoirs of Russia Historical, Political and Military from the Year MDCCXXVII to MDCCXXLI...with a Supplement Containing a Summary Account of the State of the Military, the Marine, the Commerce, &c. of that Great Empire. Translated from the Original Manuscript*, ed. D. Hume (London, 1770). There were repeated editions of this work, originally written in French, in English, French, German, and Russian. However, it should be pointed out that although written shortly after the events described, it was published only after war between the Ottoman and Russian Empires broke out again in 1768, when there was great international interest in the course of previous military action on this front.
46. Başbakanlık Osmanlı Arşivi (henceforth BOA), Plan ve Proje, 857.
47. Uzunçarşılı, *Osmanlı tarihi*, vol. 4, pt. 1, contains illustrations of a few fortresses as they were in the eighteenth century; fig. 6 shows the Özi trace under discussion here.
48. Evliya Çelebi, *Evliya Çelebi Seyahatnâmesi*, vol. 5, 94–95.
49. E.g., the sack of Sinop in 1616: see Ostapchuk, “Human Landscape,” 44–46.
50. Duffy, *Siege Warfare*, vol. 1, 206–7.
51. BOA, Maliye Defterleri (henceforth MAD) 3992.131–34.
52. The *zirâ’* (also *arşun*) measure varied over time and place: it has recently been shown to have been (at least in the Istanbul construction industry) 72.1 cm around 1520, 73.4 cm in the third quarter of the sixteenth century, and 76.4 cm in the third quarter of the eighteenth century; Evliya Çelebi’s *arşun* (a measure identical with a *zirâ’*) was 72.9 cm: see Alpay Özdural, “Sinan’s Arşın: A Survey of Ottoman Architectural Metrology,” *Muqarnas* 15 (1998): 101–15. Since we cannot know the precise length of the *zirâ’* used at Özi, we use the round figure of 75.0 cm.
53. This document has “325” written out in words. However, it is clear from references to the Main Fortress in later documents that “one thousand” (*biñ*) was left out by mistake or by convention. For example, the ditch of the Main Fortress, or the palisade around it, which of course has a greater circumference than the rampart, is variously given as being between 1,410 and 2,500 *zirâ’* long (MAD 3882.136; MAD 4355.278, 299, 306).

54. MAD 3992.131.
55. Sic: (*der şarampav-i qal'e-i mezbûre*). Normally, for reasons of security, one would not expect to find barracks within the outworks of a fortress, be it the palisade or the barbican.
56. MAD 3992.160–62. A *cebeci* (lit. “armorers”) belonged to a corps whose members originally served as auxiliaries assisting the janissaries by maintaining weapons on and off the field of battle, though by the seventeenth century they were also musket-bearing infantry; a *serdengeçdi* was a member of special shock troops prepared to carry out suicide missions.
57. MAD 3992.294–98.
58. In the sources, *Özi Qal'esi* or *Qal'e-i Özi*, or with the plural for fortress *Özi Qılâ'i* or *Qılâ'-i Özi*, which could refer either to the tri-part Main Fortress or to the entire fortress complex, or at least that on the right, Özi bank of the Dnieper mouth.
59. MAD 3992.297.
60. *Cirmleri kırqar zîrâ'* and *be-her tâbya 40 zîrâ'*; MAD 3992.297. Although in the standard Ottoman dictionaries *cirm* denotes the volume of a body, in our building registers it is used to denote area. For example, the result of a calculation in MAD 4355.287 for the surface area of proposed ditch revetment—7 *zîrâ'* x 5,000 *zîrâ'* = 35,000 *zîrâ'* (5,000, because both sides of the ditch, each estimated at 2,500 *zîrâ'*, were to be revetted)—is there labeled as *cirm*, i.e., area; see main text at n. 82.
61. In these sources sq. *zîrâ'* are referred to simply as *zîrâ'*.
62. MAD 3992.438; this mosque was named for Sultan 'Osman I (r. 1618–22). Evliya Çelebi failed to mention a mosque within Qılburun (Evliya Çelebi, *Evliya Çelebi Seyahatnâmesi*, vol. 5, 96–97).
63. Defterdar Sarı Mehmed Paşa, *Zübde-i Vekayiât*, ed. Abdülkadir Özcan (Ankara: Türk Tarih Kurumu, 1995), 734.
64. MAD 3992.452.
65. MAD 4355.124.
66. John P. LeDonne, *The Russian Empire and the World, 1700–1917: The Geopolitics of Expansion and Containment* (New York and Oxford: Oxford University Press, 1997), 90–91.
67. MAD 4355.275–309.
68. Since rows of wattled screens to protect musketeers positioned in front of the ditch and on the bastions are already specified in the text, those mentioned here as providing cover in unspecified places were probably intended for men stationed elsewhere, e.g., on the parapets atop the ramparts.
69. The materials needed to carry out these works had to be brought from far away—various sorts of wood from Moldavia and nails from Istanbul, for instance (MAD 4355.275–76).
70. There were different types of palisades—*şarampav/şaranpav* in Ottoman (from Hungarian: *sorompó*)—and failure to distinguish between them has been a source of some confusion. While all involved fixing wooden stakes into the ground and if necessary lashing them together, the stakes could be large posts, as in a stockade or palanka (see n. 5, above), or smaller staves, as in a fence-type structure. While stockades or palankas with large palisades were built both prior to and during the period of Vauban-age fortresses, the type of palisade that was essentially a fence-type barrier approximately the height of a man became an essential element of the modern fortification system. This type of palisade was placed at the front of the banquette of the covered way, where defend-
- ing musketeers were stationed in order to shoot at enemy approaching the ditch, and where the glacis began (see fig. 5). On palisades in modern-style fortresses, see the text for n. 110; on palisades as an element of palankas, see Gerejlyes and Kovács, *Archaeology of the Ottoman Period in Hungary*, 103, 112, 114, 121, 179, and 180. In the latter volume, palisaded forts are frequently called simply “palisades,” which at least in English is incorrect—“palisade” can only mean a length of wooden stakes fixed in the ground, and not an entire enclosure made of such stakes. Although the palisades used to make forts and those used to make barriers were distinct, a common technique was at times used in both fort- and barrier-palisades to make them more formidable: two (or even three) parallel rows of stakes would be set up and the space between them filled with earth (e.g., *şarampav*]lar çatub içlerün rîhtim ile doldurub, in Evliya Çelebi, *Evliya Çelebi Seyahatnâmesi*, vol. 6: *Topkapı Sarayı Kütüphanesi Revan 1457 numaralı yazmanın transkripsiyonu, dizini*, ed. Seyit Ali Kahraman and Yücel Dağlı (Istanbul: Yapı Kredi Yayınları, 2002), 133.
71. Lit. “paper of communication.” In eighteenth-century Ottoman diplomatics, the *qâ'ime* was typically a letter or memorandum between two offices, rather than a report (*arz*) from an inferior to a superior. It was written on a large sheet of paper (similar to foolscap) that, prior to being inscribed, was folded in half along the length to form two folios, giving them the appearance of sheets from a “tall and narrow” financial (*mâlîyye*) *defter*: see Mübahat Kütükoğlu, *Osmanlı belgelerinin dili (diplomatik)* (Istanbul: Kubbealtı Akademisi Kültür ve San'at Vakfı, 1994), 275–76.
72. MAD 4355.277–78. In referring to points in this and two other *qâ'imes*/memoranda of the same type, we abbreviate the name of the author and couple this with the number of the point: the second point of İbrahim Pasha's memo is İB.2, the fourth in Hasan Pasha's is HA.4, the third in İsmâ'il's İS.3, etc.; for the anonymous treatise the abbreviation AN is used. We have rearranged the order of some of the items listed in İbrahim Pasha's and Hasan Pasha's memoranda to make for easier comparison with those in İsmâ'il Pasha's, and with each other. In the case of İsmâ'il Pasha's memorandum, additional letters and numerals (Arabic and Roman) are used to refer to marginal and other sections on the same two pages, as labeled in the facsimile: see the introductory note in the Appendix. Because of limited space, we give a full rendering only of the memorandum of İsmâ'il Pasha, while the memoranda of İbrahim Pasha and Hasan Pasha are summarized. However, to provide further examples of the makeup of these registers and the possibility of delving more fully into the texts in the relevant pages, we also provide facsimiles of these two reports (figs. 7, 8). Also because of limited space we do not attempt to cover all the repairs performed at Özi as recorded in these building registers; instead we give only a representative sampling.
73. Or perhaps “deep,” if the dimensions of the ditch rather than the mass of earth that filled it is being referred to. In either case this large a figure seems problematic (or is an indication of our unfamiliarity with possible realities in such a fortress). Were the ditch at this point actually so deep, the figure then could refer to both its depth and the height of the pile of infill. One might expect the ditch to be deeper in

- the section of the fortress outside the Upper Castle than at other points, as it was furthest from the Dnieper and highest above it (see figs. 3 and 6). Were the ditch relatively level, it would of necessity have been deeper here than in the downhill stretches closer to the Dnieper, and were this a wet ditch, levelness would have been an imperative. Nonetheless, as will become evident below, lesser depths for the ditch are listed for other sections of the Main Fortress, with the apparent average being 7 *zirā'* (5.2 m). More "soundings" in the building registers will reveal what ditch depths were possible and typical. Western sources, according to Duffy, are not forthcoming on the depth of a good ditch. Judging by one vague but typical source that says the ditch should be deeper than a tall man and wider than a high tree (Duffy, *Fire and Stone*, 59), the ditch at Özi seems to have been considerably deeper than its Western counterparts.
74. We use the Istanbul *qantār* of about 56.5 kg: see İnalçık, "Introduction to Ottoman Metrology," *Turcica: Revue d'études turques* 15 (1983): 311–48, esp. 340.
75. Western fortress literature, and the examples that follow, show that checkerboard frameworks were used to hold unstable earth in place—for reinforcing the foundations of ramparts as well as for building them up, for instance. For a contemporary (1746) illustration of a timber framework beneath a rampart, including under the revetment, see Duffy, *Fire and Stone*, 41.
76. These boats were clearly intended to bring laborers and the tools they were likely to need to help clean the ditch.
77. The participation of the Cossacks—whom historians have construed as usually being the Ottomans' enemy—in the improvement of their fortress defenses reminds us of the mutabilities and ambiguities of frontier existence. A letter from the governor (*vali*) of the Özi province to a Cossack leader provides more evidence of such cooperation across this frontier: it asks him to help the *vali*'s men sent to the Zaporozhia to cut thickets for use in the repairs and construction of bastions at Özi: Oleksander Halenko, "Was the Black Sea 'Closed' before Its 'Opening' by the Russians?," unpublished paper delivered at "The Ottomans and the Sea," a conference held at the Skilliter Centre of Ottoman Studies, Cambridge University, March 29–30, 1996.
78. MAD 4355.287. In contrast to the palisade at the Lower Castle, which is specified as being on the outside, the location of this palisade—only referred to as being *of* the Bastion of Hüseyin Pasha—is not specified; it could either be in front of the ditch or at the parapet on top of the rampart (cf. n. 68, above).
79. This term also referred to wrought iron rods of similar shape: Sönmez, *Yapı ve malzeme sözlüğü*, 37.
80. Evliya Çelebi did not mention this bath when he visited in 1657, but perhaps it was already ruined and therefore unworthy of notice (Evliya Çelebi, *Evliya Çelebi Seyahatnâmesi*, vol. 5, 94–95).
81. On this and other Ottoman officials involved in the management of construction projects, albeit in the context of mosque building, see Hochhut, *Nüruosmâniye*, 18–23.
82. See n. 60, above.
83. Here and also in a marginal section on the previous page it is expressly stated that both the depth and the length are estimates (*ber vech-i tahmîn*).
84. MAD 4355.287.
85. MAD 4355.299.
86. We use the rate 1 *vuqıyye* = 1.28 kg: İnalçık, "Metrology," 318–20.
87. MAD 3882.336.
88. MAD 4355.306–7.
89. MAD 4355.292ff.
90. Entered in the building register in Istanbul as a copy (*şüret*) on 15 Dhu 'l-Qa'da 1121 (January 16, 1710).
91. In addition to the use of the term *taş* to denote stone, we find also *kārgīr*, which differs from *taş* in that it refers to masonry, or worked stone. Although according to the modern dictionaries *kāgīr* (< *kārgīr*) can denote brick masonry as well as stone masonry, in earlier Ottoman usage it referred solely to the latter; Francisus à Franciszek Meniński, *Thesaurus linguarum orientalium Turcicae-Arabicae-Persicae = Lexicon Turcico-Arabico-Persicum* (Vienna, 1680–87); repr. with introduction by Stanisław Stachowski and foreword by Mehmet Ölmez (Istanbul: Simurg, 2000), 3842. In what follows, we translate *taş* as "stone" and *kārgīr* as "stone masonry." Sönmez's dictionary of architectural terms does not refer to *kārgīr*; although the author notes many varieties of stone (under *seng*, the Persian equivalent of Turkish *taş*): Sönmez, *Yapı ve malzeme sözlüğü*, 98–99.
92. بالوان *balwan* (or *balavan*?) is not to be found in the standard dictionaries (Meninski, Redhouse, Zenker, *Tarama Sözlüğü*). However it has recently been defined by Robert Dankoff as "timber, beam" and Andreas Tietze as *direk* ("column, post, mast"); Robert Dankoff, *An Evliya Çelebi Glossary: Unusual, Dialectal and Foreign Words in the Seyahat-name* (Cambridge, MA: Department of Near Eastern Languages and Civilizations, Harvard University, 1991), 16; Andreas Tietze, *Tarihi ve etimolojik Türkiye Türkçesi lügatı = Sprachgeschichtliches und etymologisches Wörterbuch des Türkei-Türkischen*, vol. 1 (Istanbul: Simurg, 2002), 274. While these authors derive the word from Hungarian *bálvány* ("idol") or Bulgarian *balvan* ("statue"), a derivation from Serbo-Croatian *balvan* ("log, beam, block") is also possible and perhaps more plausible; Maks Fasmer [Max Vasmer], *Etimologičeskij slovar' russkogo jazyka*, 4 vols. (Moscow: Progress, 1964), vol. 1, 111, 186–87; Abdulah Škaljić, *Turcizmi u srpskohrvatskom jeziku* (Sarajevo: Svjetlost, 1966), 119. Though this word is considered of Turkic origin, Slavic languages in all likelihood preserved a meaning that fell out of use in Ottoman, at least if the standard dictionaries are any indication. In one building register, in an entry relating to materials needed for construction at Qılburun, specification of the size of oak *balvans* is given—20 *zirā'*s x 1.5 *qarışes* (span), or 15.0 x 0.30 m—which makes it a large piece of lumber (the next largest recorded in this section of the given register are tie-beams or posts [*quşaqlıq ve bağlamaq için şaranpavlıq*], which are specified as 14 *zirā'* x 1 *qarış*, or 10.5 x 0.20 m): MAD 3992.294.
93. As opposed to kiln-dried or sun-and-kiln-dried bricks (*tuğla*). For details of contents, manufacture, and types of Ottoman *kerpiçes* and *tuğlas*, see Sönmez, *Yapı ve malzeme sözlüğü*, 72–73, 106–7.
94. The text has "behind it [i.e., the palisade]" (*ardına*), but it is unclear whether the orientation is from inside or outside the palisade. On the basis of İS.4, which refers to the same wall as being in front of (*önünde*) the palisade, and more

- significantly, uses the nautical term *alarğa*, i.e., as being “in the offing” (albeit less than a foot [*ayaq*]), there is no doubt that this wall is on the exterior (country) rather than interior (ditch) side of the palisade.
95. How stakes might be used to raise the height of the bastions is not entirely clear; perhaps they were needed as scaffolding? Also, as we saw in HA.2 above, timber was used in building up bastions; for references to examples unearthed in Ottoman fortifications in Hungary, see n. 104, below.
 96. Given the concern regarding access to drinking water during attack and besiegement, it seems odd to propose that cisterns be located in the ditch, which would be a prime target—and of relatively easy access—for the enemy.
 97. I.e., ca. 1560 sq. m per thousand men, or ca. 1.6 sq. m per capita, which would have meant cramped quarters. Without even considering the possible use of bunk beds we note, however, that cramped quarters were the norm in pre-modern barracks, with three men assigned to a bed under the assumption that two out of three would be on duty at a time. Nevertheless, 1.6 sq. m per capita is about half the figure provided by Duffy—12 men for a room of 22 x 18 ft (6.7 x 5.5 m)—which amounts to 36.8 sq. m or about 3 sq. m per capita; Duffy, *Fire and Stone*, 80. That such a difference in allotted sleeping space indicates a significant difference in the living conditions of Ottoman and western European fortresses cannot be asserted without more data.
 98. MAD 3882.136–37—see the transcription and translation in the Appendix.
 99. This presumably refers to the three bastions whose construction was deemed necessary in 1695.
 100. Zdenka Veselá, “Tureckij traktat ob osmanskikh krepostjakh svernogo Prichernomorja v nachale XVIII v.,” in *Vostochnye istochniki po istorii narodov Jugo-Vostochnoj i Central'noj Evropy*, ed. A. S. Tveritina, 3 vols. (Moscow: Nauka, 1964–74), vol. 2 (1969), 98–139, esp. 102–3, 105. In this publication the report is given in printed Arabic transliteration and Russian translation with a French summary. There are a number of cruces in the text that cannot be resolved without checking the original (only the first and last pages are given in facsimile). Therefore we provide only a partial rendition of the text relevant here, leaving further analysis for when the original, preserved in the National Library in Cairo, becomes available.
 101. *Horāsān* (or the adjectival form, *horāsānī*) refers to rose-colored chalky soil, like that in Eastern Iran, from which brick dust was extracted in place of sand and mixed with lime to make an extremely strong mortar capable of withstanding cannon fire unless from close range: Murphey, *Ottoman Warfare*, 113–14; for further detail on *horāsān*, see Sönmez, *Yağı ve malzeme sözlüğü*, 49.
 102. MAD 3882.140.
 103. Indeed, according to the seventeenth-century dictionary of Meninski, the term *toñuz tamı* denoted gabions (German: *Schantzkorb*; French: *gabion*), whose wickerwork perimeters were reminiscent of pig pens (the reading *tonoz tam*, “vaulted roof” is unlikely because *tonoz* is normally written with a *nün*, whereas in the document it is with a *kef*, indicating *ñ*): Meninski, *The-saurus*, 3149–50. Regardless of the correctness of the definition in the Redhouse dictionary for the more modern form, *domuz damı*—“gallery of a mine supported by wooden props; archaic a covered gallery in a fortification”—it does not fit our context: *Redhouse yeni Türkçe-İngilizce sözlük = New Redhouse Turkish-English Dictionary* (Istanbul: Redhouse Yayınevi, 1968), 309.
 104. On excavations of various sorts of timber foundations in Ottoman fortress works in Hungary, see Gábor Hatházi, “New Findings in the Research of Turkish Palisades in Fejér County,” in Gerelyes and Kovács, *Archaeology of the Ottoman Period in Hungary*, 113–36, esp. p. 131; Gábor Tomka, “Andrásvár: A Guard-Tower in Royal Hungary’s Border-defence System,” *ibid.*, 151–53; Katalin Irás-Melis, “Pest during the Ottoman Era,” *ibid.*, 161–72, esp. 170–71.
 105. Bundles of wood or sticks bound together and used for building ramparts, for topping gabions, or, by besiegers, for filling ditches or marshy ground.
 106. And in this one instance the text states that the stone masonry (or, alternatively, beams [*balvan*]) would be used to raise the height, which implies internal rather than external application.
 107. If the wording of our sources is to be trusted, the revetments of the ditches of the Özi fortresses were faced with stone (IB.1, HA.5, İS.5, İS.9) on some occasions and on others with stone masonry (HA.1, İS.1, İS.3; as noted, the sole reference to stone or stone masonry being used for the ramparts is HA.2, which cites stone masonry to be used in building up bastions). However, our sample is too small to allow us to discern whether the more costly stone masonry came to be considered essential because it was more functional than stone in preventing water seepage (or was favored for other reasons) in successive building phases.
 108. We have no evidence concerning a ditch for the Fort of Hasan Pasha during this period.
 109. Quoted in Duffy, *Fire and Stone*, 59.
 110. Vauban, *Manual of Siegecraft and Fortification*, 32–33. His comments on the palisade in his treatise on fortress defense, though not as emphatic as these, also indicate its importance: Sébastien Le Prestre de Vauban, *Traité de la défense des places. Nouv. éd. Augmentée des Agenda du maréchal sur l’attaque et la défense, et de ses notes critiques sur le discours de Deshoulières relatif a la défense. Publiée avec l’autorisation du Ministre de la guerre, par M. le baron de Valazé* (Anselin, 1829), 26, 195–96.
 111. Though double or triple palisades filled with earth were common in Ottoman palankas: Ibolya Gerelyes, “Ottoman Architecture in the Town of Gyula,” in Gerelyes and Kovács, *Archaeology of the Ottoman Period in Hungary*, 173–80, esp. 179; also, we mentioned above a palisade wall at Qilburun supported only by earth (*dikme şaranpav dīvārınun topraq dolması*): see main text at n. 69.
 112. 7 or 8 ft. from the floor of the covered way (ignoring the banquette) to the crest, plus up to one foot above the crest: Duffy, *Fire and Stone*, 61.
 113. See n. 91, above.
 114. See the corrective by Virginia H. Aksan, “Breaking the Spell of the Baron de Tott: Reframing the Question of Military Reform in the Ottoman Empire, 1760–1830,” *International History Review* 24 (2002): 253–77.
 115. Presently we are commencing a historico-archeological project with Drs. Biliaieva, Ersoy, and others, which will include an investigation of the building history of the Aqkerman fortress.

116. Lit. "paper of communication." On *qā'ime*, see n. 71, above.
117. Normally, for the sake of stability, revetments would be built with a sloping outer face, wider at the bottom: this was known as a batter.
118. I.e., the Upper ("Old") Castle (*Qal' e-i 'Atiq*).
119. While the Turkish word *etek*, "skirt" (derived from Greek) also denotes the foot or skirt of a mountain (*New Redhouse*, 351) or the bottom part of a slope (Tietze, *Tarihi ve etimolojik lugat*, 749), *etekiyye* is not in any of the standard Ottoman dictionaries. Though it is probably a pseudo-Arabic construction (given the *-iyye* ending, perhaps aiming at a more abstract or general meaning), here it seems to have the same meaning as *etek* might in this context.
120. I.e., the Dnieper River.
121. I.e., further out from the palisade (see n. 94, above).
122. Presumably to prevent the earth placed outside the ditch (which then formed part of the glacis) from collapsing back into the ditch.
123. Possibly stairs or ramps built to allow defenders access to sections of the rampart at different levels (*banquette, terre plain*), or a sallyport: Duffy, *Fire and Stone*, 75–76.
124. During this period there were two Ottoman terms for gabion-like baskets: *sepet* (lit. "basket") and *toñuz tamı* (see n. 103, above). Whether they both denoted the same kind of gabions remains to be worked out.
125. I.e., in what remained of the old towers of the Main Castle and not in the new bastions.
126. I.e., the Main Castle consisting of the Upper, Middle, and Lower Castles.
127. On *şāhī top*, see Gábor Ágoston, "Ottoman Artillery and European Military Technology in the Fifteenth and Seventeenth Centuries," *Acta Orientalia Academiae Scientiarum Hungaricae* 47 (1994): 15–38, esp. 42–43.
128. The first letter is mistakenly written with an initial *sīn* (س) rather than an initial *se* (س)
129. I.e., the *'idu 'l-fitr* and *'idu 'l-adhā*.
130. Technically the *kīle*, a kind of bushel, was a measure of capacity, often used for grain. In common practice, however, it was given as a weight equivalent. The size of the *kīle* varied widely from province to province. Here we give equivalents in Istanbul *kīles*: 1 *kīle* = 20 *vuqıyyes* (25.6 kg). On the Istanbul *kīle*, see İnalçık, "Ottoman Metrology," 333.
131. Or Dutch rixdale: see Halil İnalçık, Suraiya Faroqhi, Bruce McGowan, Donald Quataert, and Şevket Pamuk, *An Economic and Social History of the Ottoman Empire, 1600–1914* (Cambridge: Cambridge University Press, 1994), 964.
132. Devlet Gerye II (1699–1702, 1708–13).
133. The original reads *خامی*, which may be a pseudo-Arabic *nisba* with the Persian *hām* (*hāmī*).