

LIFE AND WORKS OF MARIUS MICHEL
IN NINETEENTH-CENTURY OTTOMAN EMPIRE

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IN NINETEENTH-CENTURY OTTOMAN EMPIRE

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DECLARATION OF ORIGINALITY

I, Emine Esra Nalbant, certify that

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ABSTRACT

Life And Works of Marius Michel

In Nineteenth-Century Ottoman Empire

This thesis deals with the life and career of Marius Michel, who led the lighthouse construction movements in the late Ottoman period. The need for infrastructure to support global mobility such as ports, warehouses, railways, and lighthouses arose due to the steam technologies, industrial revolution and the increase in maritime transport and travel, witnessed by the nineteenth century. Marius Michel managed the lighthouse construction activities, first as the Director of the Ottoman Lighthouses Administration, and then through the Michel et Collas company, which had the privilege of building and managing the lighthouses he founded. In addition to this, since 1879, he received the title of Pasha and was referred to as Michel Pasha, in addition to the medals he received for his outstanding services. In 1890, he signed the Eminönü and Galata dock construction concession agreement as the founder of the Dersaadet Rihtım, Dock and Warehouse Company. Between 1892-1900, the construction of these two piers was carried out under the direction of Michel Pasha. Bernard Collas, the other partner of Michel et Collas company, obtained the Jaffa-Jerusalem railway construction concession through Société du Chemin de Fer Ottoman de Jaffa à Jérusalem et Prolongements / Ottoman Jaffa to Jerusalem Railway and Extensions Company, the railway was put into service in 1892. To conclude, this thesis examines the infrastructure construction process to serve this increase in the nineteenth century, when global connections and maritime transport increased, through Marius Michel's Life and Works.

ÖZET

On Dokuzuncu Yüzyıl Osmanlı Devleti İçinde Marius Michel'in Hayatı ve Çalışmaları

Bu tez geç Osmanlı dönemindeki deniz feneri inşaatı hareketlerini yönetmiş olan Marius Michel'in hayatı ve kariyerini ele almaktadır. On dokuzuncu yüzyılın tanıklık etmiş olduğu, buharlı teknolojileri, endüstriyel devrim ve buna bağlı olan deniz taşımacılığı ve seyahatlerin artışına bağlı olarak limanlar, antrepolar, demir yolları ve deniz fenerleri gibi küresel ölçekteki hareketliliği destekleyecek altyapı ihtiyacı doğmuştur. Marius Michel önce Osmanlı Fenerler İdaresi Müdürü olarak, sonra da kurduğu fenerlerin inşaat ve yönetim imtiyazına sahip olan Michel et Collas şirketi üzerinden deniz feneri inşaat hareketlerini yönetmiştir. Bunun yanı sıra 1879 yılından itibaren, üstün hizmetleri nedeniyle aldığı nişanların yanı sıra Paşa unvanını almış ve Michel Paşa olarak anılmıştır. 1890 yılında Eminönü ve Galata rıhtım inşaatı imtiyaz sözleşmesini Dersaadet Rıhtım, Dok ve Antrepolar Şirketinin kurucusu olarak imzalamıştır. 1892-1900 yılları arasında bu iki rıhtımın inşaatı Michel Paşa yönetiminde gerçekleşmiştir. Michel et Collas şirketinin diğer ortağı Bernard Collas ise Yafa- Kudüs demiryolu inşaat imtiyazını Société du Chemin de Fer Ottoman de Jaffa à Jérusalem et Prolongements / Osmanlı Yafa'dan Kudüs'e Demiryolu ve Uzantıları Şirketi aracılığı ile elde etmiştir, demir yolu 1892 yılında hizmete girmiştir. Sonuç olarak, bu tez global bağlantıların ve deniz taşımacılığının artışa geçtiği on dokuzuncu yüzyıl sürecinde bu artışa hizmet etmek üzere yapılan altyapı inşaat sürecini Marius Michel'in Hayatı ve Çalışmaları üzerinden incelemektedir.

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*To two people I have lost
before starting this thesis
my great grandmother Emine Sağırkaya
and my father Kemal Nalbant*

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION	1
1.1 Blaise Marius Michel	3
1.2 Literature Review	7
1.3 Sources	14
1.4 Methodology	15
1.5 Road Map	17
CHAPTER 2 NINETEENTH CENTURY TECHNOLOGICAL DEVELOPMENTS REGARDING THE STEAMSHIPS AND LIGHTHOUSES	22
2.1 Introduction	22
2.2 Steamship Technology Leading to Global Connections	23
2.3 Companies and Aspects of Global Connections	29
2.3.1 Mail-Postal Service	37
2.3.2 Passenger Travel	39
2.3.3 Material	41
2.4 From Steamship to Its Infrastructure: Lighthouses	43
2.5 The History of Lighthouses Before and After Nineteenth Century Technology	47
2.6 The Crimean War and the Paris Agreement	55
CHAPTER 3: WORK OF MARIUS MICHEL IN OTTOMAN EMPIRE DURING 1855-1860	58

3.1 Introduction	58
3.2 Marius Michel and His work at Messageries Maritime until 1855.....	59
3.3 Marius Michel, the General Director of Ottoman Lighthouses	61
3.3.1 The agreement signed between the General Director of the Ottoman Lighthouse Administration, Michel, and Engineer Lepaute	63
3.3.2 The Necessary Equipment and Its Purchase	64
3.3.3 Lighting of Sulina Strait and Zmiinyi Island	66
3.4 1856 tariffs	67
3.5 The lighthouse construction until the arrival of Collas.....	70
3.6 Collas meets Marius Michel leading to the 1860 Contract of Lighthouse Concession	71
3.6.1 Bernard Camille Collas	72
3.6.2 Discussions of the 1860 Contract of Lighthouse Concession.....	72
3.7 Lighthouse Concession Contract of August 8/20, 1860	74
3.8 The Société Collas et Michel	76
CHAPTER 4 WORK OF MARIUS MICHEL IN OTTOMAN EMPIRE DURING 1860-1879	78
4.1 Introduction	78
4.2 Aftermath of 1860 Contract in terms of Construction Work	80
4.2.1 Ilanname.....	85
4.2.2. The Lighthouse Lines Listed in the Ilanname Documents.....	87
4.2.3 A Matter of Longitude	90

4.2.4 Imposing the Contract and Tariff of 1856	92
4.3 Navigational Developments and Lighthouses.....	94
4.4 The 1850-1870 Period Regarding Lighthouses	99
4.5 The Suez Canal	104
4.6 The Second Concession Agreement in 1879	107
CHAPTER 5 WORK OF MARIUS MICHEL IN OTTOMAN EMPIRE DURING	
1879-1890.	109
5.1 Introduction.....	109
5.2 1879 and 1890 Concession Agreement of the Istanbul Quays and its Repercussion	113
5.3 Investments of Bernard Collas	117
5.3.1 Haydarpaşa Attempt.....	118
5.3.2 Jaffa-Jerusalem Railroad.....	120
5.4 The 1870-1890 Period Regarding Lighthouses	123
5.4.1 Lighthouse Construction in the Red Sea.....	124
5.4.2 Lighthouse Construction in Between Second and Third Concession Agreement.....	125
5.4.3 General Evaluation of the Construction and Use of the Lighthouses Between 1870-1890	126
5.5 The Third Concession Agreement in 1894	131
CHAPTER 6 CONCLUSION.....	133
APPENDIX A :TARIFF OF LIGHTHOUSE FEES OF THE OTTOMAN EMPIRE	

OF 1 SEPTEMBER 1856.....	139
APPENDIX B : LIGHTHOUSE CONCESSION CONTRACT OF AUGUST 8/20, 1860.....	140
APPENDIX C: TRANSLATION OF LIGHTHOUSE CONCESSION CONTRACT OF AUGUST 8/20, 1860.....	147
APPENDIX D : İLANNAME DOCUMENTS FROM 1861-1879 PERIOD.....	151
APPENDIX E : MAP OF LIGHTHOUSES AT BLACK SEA SHORES IN 1899.	161
REFERENCES.....	162

LIST OF FIGURES

Figure 1 Lighthouse of Alexandria miniature in Moğmal-ot-Tavārīḥva'l-Qaşaş ca.1475.....	48
Figure 2 Fresnel lens and lighthouse light system illustration.....	52
Figure 3 Plan and section of Fresnel Burners.....	53
Figure 4 Comparative Statement of the Coast-lights according to the countries in the years 1860 and 1885 respectively.....	54
Figure 5 Lighthouse in Rhodes Island.....	84
Figure 6 Mediterranean and Indian Ocean Lighthouses in 1850 and 1870.....	101
Figure 7 General maritime movement of the Ottoman Empire (in tens of thousands of tons of register) and total income of the Lighthouses (in thousands of francs).....	104
Figure 8 Port Said Lighthouse in the entrance of Suez Canal.....	106
Figure 9 Suez Canal.....	106
Figure 10 View of the Galata Quay	115
Figure 11 Project drawing of Galata Quay.....	116
Figure 12 Chemin de fer de Jaffa a Jerusalem.....	122
Figure 13 Mediterranean and Indian Ocean Lighthouses in 1870 and 1890.....	128

CHAPTER 1

INTRODUCTION

The nineteenth century is known to the world as the era of technology and innovation. A significant part of this era of development is, undoubtedly, steamships, which directly influenced maritime trade, travel, communication, and naval activities. Throughout the nineteenth century, marine transportation experienced an enormous transformation. The development in steam technology first allowed steamships to set sail on rivers, then created a global flow of people, mail and cargo in the oceans. The built environment of the shores changed radically, as the reflection of the intensifying maritime traffic manifested itself in the newly erected lighthouses, quays, and railroads connecting lands to ports. A transformation on such level required an infrastructural web of different types to support and facilitate this flow. This web included the first and the most modern quays; otherwise, the steamships could not approach their arriving points. Other infrastructural networks include railways, telegraph lines, lighthouses, etc. This study will focus on establishing the lighthouse network in the Ottoman Empire throughout the nineteenth century. The Atlas of Coulier, dated 1844, lists 24 lighthouses on the shores of the Ottoman Empire. In the year 1879, the number of lighthouses along the coastlines of the Ottoman Empire was 110.¹

The person behind these constructions was Blaise Marius Michel, Empire's General Administrator of Lighthouses and one of the founders of the company

¹ Thobie, “L’ administration Générale Des Phares del’ Empire Ottoman et la Société Collas Et Michel (1860— 1960) ”, 39-41.

Société Collas et Michel.² This company had a concession contract with the Ottoman government to construct and manage the lighthouses on the Ottoman shores. The agreement briefly proposes to cover construction costs to gain 78% of the earnings later on. He was director of Société Collas et Michel, as well as the director of Société des Quais, Docks et Entrepôts de Constantinople, the construction company of the Eminönü and Galata Quays. The other owner of Société Collas et Michel, B. C. Collas, was the first president of Ottoman Railway Company from Jaffa to Jerusalem.³ The concessionaires of the lighthouses, also investing in the quays and railways, suggested an interlinked global infrastructure network, which included the lighthouses. To put it in another way, I claim that the increasing number of lighthouses and the creation of a web of lighthouses should not be read as a singular concept. The establishment of the lighthouse network should be discussed together with other infrastructural projects such as the railroads and quays. I will focus on the building activity of the lighthouses along the shores of the Ottoman Empire, through the lens of Marius Michel's life and career. I will also argue that the Ottoman lighthouse web was integrated into a global infrastructure network containing the quays, telegraph lines, canals and railroad lines, which facilitated the intensification of maritime travel. This intertwined infrastructure network was made of different and "unequally formed" webs of infrastructures. Drawing upon Kentel's take on unequally formed assemblages, where he recommends "...treat[ing] environmental and urban spaces as parts of a complex and unequally formed assemblage", I consider the intertwined infrastructure network as an assemblage in the global scale.⁴

² Hastaoglou-Martinidis, "The Cartography of Harbour Construction in the Eastern Mediterranean Cities: Technical and Urban Modernization in the Late Nineteenth Century", 78-99.

³ Thobie, "L'administration Générale Des Phares del' Empire Ottoman et la Société Collas Et Michel (1860— 1960) ", 39-41.

⁴ Kentel, "Assembling 'Cosmopolitan' Pera: An Infrastructural History of Late Ottoman Istanbul", 5

Moreover, this assemblage is made of different types of infrastructure webs that are unequal in terms of complexity of the construction process. Maritime travel became regular and intensified as a result of the developing steamship technology throughout the nineteenth century. In addition, after the trade treaties with major European nations in 1838 and 1839, the Ottoman Empire's foreign commerce more than quintupled between 1840 and 1870. Despite this, the absence of infrastructure spelled difficulties for foreign merchants. As a result, the building of new infrastructure elements such as railroads and ports were also critical for economic reasons.⁵ Before discussing the relative literature, sources, and methodology, I will introduce Marius Michel's biography, as he plays a key role in my investigation of the network of modern Ottoman lighthouses.

1.1 Blaise Marius Michel

Marius Michel, or in his full name Blaise Marius Michel, was born on July 16, 1819, at Sanary, in south of France. At that point in time, Sanary was called St. Nazaire. Marius Michel was descendent of a sailor. His father was a lieutenant in the royal navy of Louis Philippe, and his mother's lineage is that of a mariner's. His mother Josephine's grandfather on her mother's side was a long-distance captain; her grandfather on her father's side was an artillery captain on the king's ships. At age of 16, Marius Michel joined his father on one of his military missions, as a low-rank sailor. He raised in ranks and became a first-class officer in 1839 at the age of 20.

For the following four years, he took part in several campaigns as a first-class officer. He requested to be released from active service to enter the State merchant navy, on April 22, 1843. He was assigned to the benefit of the steamboats serving the

⁵ Geyikdağı, "French Direct Investments in the Ottoman Empire before World War I", 525-561

Near East. By the ministerial decision of May 15, 1843, he obtained the title "captain of long course".⁶ He sailed the Marseille-Proche-Orient line for ten years, with a few variations. First as a lieutenant, then as first mate, and finally as acting commander. These repetitive trips throughout ten years provided Marius Michel with significant navigational knowledge on the eastern Mediterranean coastline. This knowledge also gave him a perception of the most favorable lighthouses and different routes followed by the regular couriers. In his book *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel* (The General Administration of Lighthouses of the Ottoman Empire and the Collas and Michel Company) Thobie explored the descriptive narrative of the lighthouse building and the Collas and Michel Company in depth. He states that, these repetitive trips on more or less the same course allowed Marius Michel to observe the lack of lighting in the Eastern Mediterranean. This suggested the need for a systematic approach to lighthouse construction in order to establish a network of lighthouses in the Eastern Mediterranean. During the years he spent in the postal service, he also worked on a systematic survey of the shores of the Ottoman Empire and drew up a marking plan of considerable precision.⁷

Meanwhile, the postal service that Marius Michel worked with underwent a profound transformation. This service was formerly a part of the French navy and in 1851, it was transformed into the company of Messageries Maritimes. While it was commercialized, the company nevertheless aided worked in tandem with the French government during the Crimean War.⁸

⁶ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

⁷ Thobie, "Le rôle de Michel Pacha dans l'administration générale des phares de l'Empire ottoman", 61-85.

⁸ Uygun, "Osmanlı Sularında Rekabet: Mesajeri Maritim Vapur Kumpanyası (1851-1914)", 40-45.

While these maritime campaigns were taking place in the Black Sea, in a sudden turn of luck, the General Count de Montebello, aide-de-camp of Napoleon III, embarked on Marius Michel's boat, since the ship on which he was supposed to return to France had just been shipwrecked in the Black Sea. The Count was on his way to return from his mission to France, to report on the Crimean War to Napoléon III. During the trip to France, Marius Michel presented the Count General his idea and designs concerning the lighthouses for the Eastern Mediterranean. Count de Montebello was highly impressed by Marius Michel's navigational knowledge of regional routes and his practical knowledge and expertise in the field. Arriving at Marseilles on January 5, 1855, General Count de Montebello took Marius' brief to presentation it to the emperor. The Admiralty Council, comprising of Admiral Bruat, and the Allied Admirals, Sir Edmund Lyons and Ahmet Pasha, received the project favorably. On August 1, 1855, as per the proposal of Napoleon III, Blaise Marius Michel was appointed General Director of the Ottoman Empire Lighthouses by Sultan Abdulmecid.

Marius Michel managed the Ottoman Lighthouse Directorate for five years as a civil servant of the Ottoman Empire. After this period, the management of the Lighthouses was transformed into a 19-year concession (continuously renewed until the fall of the empire). The same year, Société Collas et Michel was formed to acquire the privilege of constructing lighthouses located in the Ottoman Empire and their operation under the conditions accepted by Collas and Michel and the Ottoman government. The duration of the concession was set at 20 years from the day on which the work was to be completed on all lines. The two head offices of the company were located in Paris and Constantinople, the former overseeing administrative matters and the latter attending to management. For the operation of

this concession, Major Michel joined forces with Camille Collas, a deputy of the French National Assembly (of May 1849) and intermediary mainly for the shipment in the Levant of equipment purchased in France. The first lighthouse concession contract was granted, a commitment was made on August 8/20, 1860, to increase the number of lighthouses from 22 to 96 in 3 years. In 1879, the contract was extended for 20 years, then in 1894 for another 25 years. The construction of the Ottoman lighthouses would become the lasting source of immense fortune for the two partners.⁹

During the nineteenth century, Ottoman Empire was experiencing an increase in foreign commerce and integration to the global market. This volume is related to both new market searches the European countries experienced during the industrial developments and the easing in the maritime transportation. To facilitate the maritime connections and trade activities, foreigners had to construct new roads, railroads, quays, telegraph lines and lighthouses. These building activities were done with the direct investments of foreigners. Marius Michel was one of these entrepreneurs who was directly interested in, first and foremost, lighthouses, but also quay structures. Moreover his partner in the lighthouse business, Bernard Collas was also interested in investing in infrastructure projects besides lighthouses. Marius Michel's career path is central to the global maritime trade and mobility developments.

Apart from this work for two terms, Marius Michel was the mayor of Sanary-Sur-Mer. During his first term as mayor (1865 - 1872), Marius Michel became interested in maritime issues, which he knew well from his experiences on the shores of the Bosphorus. His first period as the mayor of Sanary-Sur-Mer in 1865-1876,

⁹ Thobie, "L' administration Générale Des Phares del' Empire Ottoman et la Société Collas Et Michel (1860— 1960) ", 11-15.

Marius Michel initiated quay construction in his town. From 1892 to 1894, he spared no effort to modernize it and make the city a tourist attraction. He died on January 6, 1907, in his Château du Manteau, in Tamaris-sur-Mer.¹⁰

1.2 Literature Review

To go over the literature for the lighthouses in the nineteenth-century Ottoman Empire, I should look through the secondary literature regarding the increase in maritime traffic as well as maritime trade at a global level with respect to steamship technology. During such literature scan, I considered the literature of “port-cities” (especially in the Eastern Mediterranean during the nineteenth century, and global trade within the nineteenth century Ottoman realm. To this end, I separated the secondary literature into three groups alongside studies that consider the spatial historiography of the Eastern Mediterranean: The first part involves steamship technology on a global scale with consideration of material and environmental impact. The second concentrates on steamship technology applications in the Ottoman Empire. Lastly, I will consider the literature on ferry services in the Ottoman Empire within the navy. In the literature drawing upon the narratives for the nineteenth-century global scene concerns the steamship technology, including the Ottoman realm. On Barak’s recent work, *Powering Empire: How Coal Made the Middle East and Sparked Global Carbonization*,¹¹ and Name? Searight’s book, *Steaming East: The Forging of Steamship and Rail Links between Europe and Asia*,¹² are central for this study. Searight’s study is critical to provide the foundation of prominence and increasing use of steamship in global scale

¹⁰ Office de Tourisme de Sanary-sur-Mer, “Exposition Michel Pasha”.

¹¹ Barak, “Powering Empire: How Coal Made the Middle East and Sparked Global Carbonization”.

¹² Searight, “Steaming East: The Forging of Steamship and Rail Links between Europe and Asia.”.

and evaluating steamship and rail links together. Barak's work is more recent and significant in terms of the richness of his approach. It revolves around the use of coal for the steamships during the nineteenth and beginning of the twentieth centuries. Moreover, his work draws level with current trends in environmental approaches to Ottoman history. He considers the requirement of coal for maritime dynamism involved in the changes in steamer technology, and at the same time investigates networks of depots organized for easy access coal. This depot network is not separated from the infrastructure networks of lighthouses, telegraphy and ports supporting maritime dynamism. Names? Galvin and Green present a collection of essays in *Global Muslims in the Age of Steam and Print*, focusing on steam and print technology in the same period. Among these works, it occupies a different position since the presented studies in this collection consider different technological and navigational advancements simultaneously within the global mobility in the nineteenth century.¹³

The literature concerning the application of steamship technology in the Ottoman navy has an overall descriptive approach. Regarding the use of steamship technology in the navy, the works of Names? Düzcü and Bal were helpful for this study. Their studies, regarding the adaptation of the advancements in steamship technology in the Ottoman realm, are mainly limited to the military realm.¹⁴ The governmental institutions of steamships functioning for civilian passengers, cargo transportation within the main naval arsenal of the Ottoman Navy *Tersane-i Amire*, are covered in Names Koraltürk and Güleriyüz's works.¹⁵ Their works are important

¹³ Gelvin and Green, "Global Muslims in the Age of Steam and Print."

¹⁴ Bal, "XIX. Yüzyıl Buharlı Gemiler Dönemi: Osmanlı Bahriyesi", Düzcü, "Yelkenliden Buharlıya Geçişte Osmanlı Denizciliği (1825-1855)."

¹⁵ Koraltürk, "Şirket-i Hayriye (1851-1945).", Koraltürk, "Haliç'te Ulaşım ve Haliç Vapurları Şirketi, 1909-1941", Koraltürk, "Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı.", Güleriyüz, "İstanbul vapurları (İstanbul ferries)".

to understand the utilization of ferries in passenger transportation and situating their institutional ties with the *Tersane-i Amire*. These works focus on the Ottoman case, and they do not discuss the passenger transportation with respect to the global framework of civilian steamship use. Due to their military focus these works fall short in considering the development of Ottoman Maritime trade. In addition to these works, I should mention Süleyman Uygun's book on the French steamship company Messageries Maritimes, which is the steamship company Michel worked for, prior to his mission as the General Director of the Ottoman Lighthouses, and its relationship with the Ottoman state.¹⁶ This book was beneficial for my study in several aspects. Firstly, it formulates the relationship between the Ottoman State and a foreign global steamship company, and discusses the efforts regarding the routes the company sought to add steamer trips within the Ottoman shores. Secondly, it displays the position of Marius Michel as a captain in a steamship company, and describes his work in the Thessaloniki lines; demonstrating Thobie's argument about the knowledge on the Eastern Mediterranean that Marius Michel acquired.

As a general trend, the increasing maritime traffic on a global scale during the nineteenth century and its spatial reflection in the Ottoman realm are more commonly read from the perspective of the ports and port cities rather than infrastructures.¹⁷ There are several studies concerning concessions of buildings and

¹⁶ Uygun, Süleyman "Osmanlı Sularında Rekabet: Mesajeri Maritim Vapur Kumpanyası (1851-1914)".

¹⁷ For recent examples and further reading : Jens Hanssen, *Fin de Siècle Beirut: The Making of an Ottoman Provincial Capital* (Oxford; Oxford University Press, 2005), 3-4, Sibel Zandi-Sayek, *Ottoman Izmir: The Rise of a Cosmopolitan Port 1840/1880* (Minneapolis; London: University of Minnesota Press, 2012), 3-4. Özyüksel, Murat. *The Berlin-Baghdad Railway and the Ottoman Empire: Industrialization, Imperial Germany and the Middle East*. Library of Ottoman Studies 47. London: I.B. Tauris & Co. Ltd, 2016. İham Khuri-Makdisi, *The Eastern Mediterranean and the Making of Global Radicalism, 1860– 1914* (Berkeley: University of California Press, 2010), Biray Kolluoğlu and Meltem Toksöz, "Mapping Out the Eastern Mediterranean: Toward a Cartography of Cities of Commerce," in *Cities of the Mediterranean: From the Ottomans to the Present Day*, ed. Biray Kolluoğlu and Meltem Toksöz (London: I.B. Tauris, 2010), Reşat Kasaba, "Izmir 1922: A Port City Unravels," in *Modernity and Culture from the Mediterranean to the Indian Ocean, 1890-1920*, Meropi Anastassiadou, *Tanzimat Çağında Bir Osmanlı Şehri Selanik (1830-1912)*.

operating activity infrastructures facilitating maritime trade. Conrad explains the correlation of networks and globalization as follows: “globalization process is characterized by a fundamental reconfiguration of power and space that in its outlines resembles a network”.¹⁸ There is a growing body of literature that recognizes the conceptualization of "network" within global history. Faruk Tabak’s article “Imperial rivalry and port-cities: a view from above” was one of the most prominent examples of this approach and his work considers the Eastern Mediterranean geography. His work claims that port-cities and their dynamism during the nineteenth century should be explained with respect to the world-system from the 1870s to the 1920s, instead of as singular histories of Ottoman maritime cities. The mentioned world-system also leads to a new level of connections which I elaborate throughout this thesis as intensified maritime transportation:

To some, the interconnectedness among different parts of the globe at this time was much more sophisticated than its present-day reincarnation. During this period, capital, labour, and commodities criss-crossed frontiers with enviable ease, and in growing magnitudes. The Ottoman port-cities flourished in this propitious conjuncture.¹⁹

The discussions in the book “*Property as Contested Domain*”, written by Huricihan İslamoğlu, should be definitely mentioned especially in the topic of correlation between spatiality and the market:

“... “the order of the market,” or capitalism as a generalized system of commodity production and exchange, belonged to a historically specific moment—to a terrain of specific power configurations. Its development has been inseparable from the ordering of social relations by centralized states that represented such a terrain.”²⁰

Her study is influential not only in terms of space-market relations but also to understand the ordering of the property relations in the state centralization process

¹⁸ Conrad, Sebastian. *What Is Global History?* Princeton: Princeton University Press, 2016.

¹⁹ Tabak, “Imperial rivalry and port-cities: a view from above,” 85.

²⁰ İslamoğlu, “Property as Contested Domain,” 13-14.

with administrative rulings and codes. Her evaluation of the Mecelle-i Umûr-ı Belediyye in this sense was very helpful for me for both understanding Mecelle(collection), which is the Ottoman civil code, and examining the concession agreements in a similar manner. Furthermore, her work examines the mentioned relations in the Ottoman realm while referring to the great transformations of nineteenth century in the global level.

The literature on the history of infrastructure in the Ottoman world is focused mainly on railroad implementations in the late nineteenth-century Ottoman Empire.²¹ A small number of cross-sectional studies suggests an association between different infrastructure networks. For example, railway building activity is rarely evaluated in connection to the construction of port structures.²² So far, little attention has been paid to the role of lighthouses as infrastructure elements contributing to the material aspect of Ottoman modernization. Even less attention has been paid to investigating the associations between railroads, quays, and lighthouse constructions as part of an interlinked history of globalizing infrastructure networks in the nineteenth century. Thobie provides a descriptive narrative of lighthouse building activity in nineteenth-century Ottoman Empire and later in the Republic of Turkey until 1960. Thobie's work, published in 2004, was the first study covering lighthouses, but it did not deal with their interaction with other infrastructures. I wish to introduce the web of lighthouses as an essential part of the networks of infrastructure centered around improving steamship technology as part of an understanding of the Eastern Mediterranean in the context of global history. This study focuses on seas and oceans as transnational spaces, and is conversant with narratives of alternative spatial

²¹ Özyüksel, "The Berlin-Baghdad Railway and the Ottoman Empire: Industrialization, Imperial Germany and the Middle East".

²² Fawaz, Leila Tarazi, C. A. Bayly, and Robert Ilbert, eds. *Modernity and Culture: From the Mediterranean to the Indian Ocean*. New York: Columbia University Press, 2002.

interactions such as the history of commodities. Of course it benefits from recent studies that conceptualize the issue of “networks” within the context of global history.

The closest work considering the infrastructures in a global scale together in the Ottoman world is Zeynep Çelik’s work *Architecture, and the City: French-Ottoman Encounters*, which defines networks of railroads, ports and telegraph lines as connectors of different parts of the imperial land.²³ Furthermore, Wolfgang Schivelbusch’s study, *The Railway Journey: Industrialization of Time and Space in the 19th Century*, is concerned with the nature of transportation as it transforms with the coming of steam engine technology and its affiliated activities. His work established the base to articulate the idea of the intensification of transportation, explaining the spatial and temporal impact of steam engines.²⁴ This study is mainly focused on the impact of the railway from a Eurocentric perspective. Hence, none of these studies cover the infrastructural histories of the nineteenth century from a global angle, and fail to provide insights on the case of lighthouses in the eastern Mediterranean and the Black Sea.

The development of other infrastructural elements such as the telegraph lines, railroad, and port network and their correlation with facilitating the maritime trade is already discussed above; however, little attention has been paid to lighthouses. I relate my own reading of the lighthouse building activity in the nineteenth-century Ottoman realm to that of Jacques Thobie who discusses the technological development of steamships and their influence in terms of the increasing frequency of maritime travel, making further connections with other infrastructural projects. His work provided me the basic terminology for this study. The literature on the

²³ Çelik, Zeynep. *Empire, Architecture, and the City: French-Ottoman Encounters, 1830-1914*.

²⁴ Schivelbusch, “The Railway Journey: Industrialization of Time and Space in the 19th Century”.

lighthouse construction in the nineteenth-century Ottoman Empire is central in two works: Firstly, Thobie's work, which is centered around the lighthouse construction in the Ottoman Empire from 1860 to 1960. However, this extensive study, focusing on lighthouse administration in the nineteenth-century Ottoman Empire, applies only a descriptive approach. Secondly, lighthouse construction in the nineteenth-century Ottoman Empire is included in Barak's recent work, which revolves around the element of coal in the nineteenth century, investigating the coal corridor stretching from London to Bombay as a part of the infrastructure network facilitating navigational security.²⁵ The studies I have consulted consider the globalization process in the nineteenth century in relation to the technological innovations of the steamers, and some explain the application of these advancements within the limits of the applications in the Ottoman Empire. So far, in the literature, spatial aspects of maritime dynamics and global mobility are studied only in relation to "port city" development in the nineteenth century. These studies touch upon the integration of Ottoman Empire to the world market / capitalist world system, and concentrate on East Mediterranean port city histories during the nineteenth century. While they make use of concepts such as "interconnectedness" and "network", they fall short in the material sense. In other words, the material and infrastructural history aspects are missing in existing Eastern Mediterranean port city histories. If the study is not a mostly insular work of the port city as a single entity and has a global angle it lacks the material connections. Or, in the reverse sense, the infrastructural histories of

²⁵ In addition to these there were two restoration theses regarding the conservation of the lighthouse edifices in Turkey, Ay, İstanbul Boğazındaki Deniz Fenerleri ve Tahlisiye Yapılarının Koruma ve Değerlendirilmesi and Yerlikaya, İzmit Körfezi'ndeki Tarihi Deniz Fenerlerinin Mimari Analizi ve Koruma Önerileri. Also, there is an article about Establishment and Development of Lighthouses in Turkey: Koca, Y. N. "Denizlerimizi Aydınlatanlar: Türkiye'de Fenerlerin Kuruluşu ve Gelişimi", 103-117.

nineteenth-century Eastern Mediterranean port cities are singular histories, lacking an insight into global connections.

As I was going through these studies, I realized that Michel Pasha was a prominent actor and a central character to the ongoing issues of nineteenth century and there are no studies with focus on his life. The journey of his life and career displays connection among the different types of infrastructure projects; furthermore, these links become concrete as one traces his investments. Therefore, in order to trace and explore the multilayered relationships among the maritime dynamics, global mobilization and trade and construction activities of global scale infrastructure facilities such as lighthouses, railways, and quays, I benefited from Marius Michel's life and works as a lens. This thesis is a preliminary study centered around Marius Michel's career path, leading to becoming of Michel Pasha in order to revealing the complexities of infrastructure projects in nineteenth century with respect to steam engine technologies. While doing so, this study considers both the differences and similarities of these infrastructure webs constituting the intertwined infrastructure network in global scale.

1.3 Sources

The official state documents of the Ottoman Empire about Michel Pasha and B. C. Collas are my main primary sources on the subject of lighthouses. These include the *ilanname* documents which are the records that present foundation date of the lighthouses, the locations they were firstly illuminated, features of their light, and the concession contracts which are found in the Ottoman State Archives in Istanbul. I have used the *ilannames* covering the period of 1861-1879.²⁶ In addition

²⁶ COA, HR. ID. 916

to the archival documents I used, a book about Turkey, "*La Turquie en 1864*,"²⁷ written by B. C. Collas in 1864 about the Ottoman Empire and the memoir of Ferdinand de Lesseps *Recollections of Forty Years (1887)*,²⁸ the concessions holder for constructing the Suez Canal, written by himself. Additionally, there are various books written during the nineteenth century about the implantation and construction of lighthouses to inform about the development of lighthouse technology.²⁹ On top of all this, I used Zihni Bilge's account titled *İstanbul Rıhtımlarının Tarihçesi (The History of Quays of Istanbul: The Quay, Dock, and Warehouse Company) (1955)*, regarding the quay companies of Istanbul.³⁰ Also, I utilized a central source regarding the concession agreements, the fifth volume of the *Mecelle-i Umur-i Belediye*, a reference work written by Osman Nuri Ergin, a bureaucrat at the Istanbul Municipality at beginning of the twentieth century.³¹ Lastly, I used the Hamidian Visual collecting in order to provide lighthouse, Suez Canal and Istanbul Quay photographs. These photographs are useful for thesis to display the concrete part of the discussed networks.

1.4 Methodology

The second half of the 19th century is a period of great change in terms of the steam engine technology and period of great development of infrastructure. Marius Michel's life and works during the nineteenth century Ottoman Empire is a very useful frame to trace this change and development. Later, I decided to form my study

²⁷ Collas 1864'te Türkiye: Tanzimat sonrası Düzenlemeler ve Kapitülasyonların Tam Metni.

²⁸ De Lesseps, *Recollections of Forty Years*.

²⁹ Stevenson, *Lighthouse Construction and Illumination*, Davenport, *The Story of Our Lighthouses and Lightships: Descriptive and Historical*.

³⁰ Bilge, *İstanbul Rıhtımlarının Tarihçesi*.

³¹ Ergin, *Mecelle-i Umûr-ı Belediye*, 2275-3035

around Michel Pasha's career, in terms of his works in nineteenth century Ottoman Empire, I started to formulate my initial questions founding around the key concepts of my thesis. My questions are: Were the infrastructures such as quays, canals, railways, and lighthouses directly related with the technological developments in nineteenth century, especially the steam engine innovation? How much of this relation was correlated with the increased maritime trade in global scale and the situation of Ottoman Empire in this global market? Considering that the existing connections between the first two questions I have searched, does the lighthouse construction activity really have a role in these connections or how the role of lighthouses in the Ottoman shores during nineteenth century situate within this complex network of maritime flows and infrastructure? Since my questions are quite intertwined, I had already decided to revolve my thesis around Michel Pasha's career as a lens to understand this process. I have selected Marius Michel because his works in Ottoman Empire could be used as an example foreign direct investment of infrastructure for maritime trade during the nineteenth century which can demonstrate the links I searched for in my questions.

In order to answer these questions, other than tracing the life and career of Marius Michel as the frame of reference, I have also revisited the interconnectedness created during the nineteenth century and its grounds. These grounds included but were not limited to the steam engine technology and the increased maritime traffic. The reasons of global connectivity in the nineteenth century Ottoman realm also correlated with foreign direct investments. These investments are typically concerned with the link with infrastructure development and marine trade. While I examined Marius Michel's life and career, I aimed to also reveal the concession process and making of these infrastructures as a part of general trend in Ottoman Empire

scattered in global scale with the main focus of lighthouses. In order to do that I have used various types of sources together; the concession agreements to understand conditions of such arrangements, the *ilaname* documents and maps to trace the construction activity itself and the profit tables of the concession holder company to demonstrate the outcome. Simultaneously, I provide some background historical information for the improvements on the steam engine technology as well as the concession and construction process of other major infrastructures which also accommodated the intensified maritime transportation.

1.5 Road Map

In the second chapter, I give the necessary contextual framework in order to trace the lighthouse construction activity in the coastlines of the Ottoman Empire and the correlation of this activity with the increased maritime traffic on a global scale. To this end, I begin with the global development of steamship technology during the nineteenth century. Later, I cover the applications of this technological development in the Ottoman Empire, mainly in the context of the Ottoman Navy. Then, I provide examples concerned with the use of steamship in areas other than the navy. Moreover, I discuss the Ottoman and foreign steamship companies; some of which were connected with the navy. I evaluate these companies under three major themes: mail, passenger, and cargo. After providing foundational data on the increase in the global intensity and variety maritime transportation, I move on to discuss the role of infrastructures that were required to facilitate increasing naval traffic. At this point, I investigate material technological innovations effecting the development of lighthouses in the nineteenth century. To conclude, this chapter establishes a

background for lighthouse technology and management of steamship services in the Ottoman Empire inside Ottoman marine forces.

In chapter three, I narrate Marius Michel's early life and his career in the postal ship of Messageries Maritimes. Later, I cover the events which occurred during the Crimean War and led to Marius Michel presenting his idea regarding the potential of lighthouse construction in the Eastern Mediterranean to Olivier Lannes de Montebello, a personal friend and aide-de-camp of Napoleon III. Count de Montebello brought this idea to Napoleon III, leading the way to Marius Michel becoming the General Administrator of Ottoman Lighthouses. Later, I discuss his career as General Administrator of Ottoman Lighthouses between 1855-1860. This section includes publishing the lighthouse fees tariff to be collected from ports and the backlash it faced. I finalize the third chapter with the establishment of Société Collas et Michel, and the first lighthouse construction and management concession agreement signed in 1860.

In chapter four, I comprehensively cover the lighthouse construction activity. I focus on the lighthouse construction activity as the aftermath of the first signed concession agreement of lighthouse building and management in 1860-1879. I examine the establishment of the lighthouse network within the coastlines of the Ottoman Empire. To that end, I benefit from the *ilanname* documents. *Ilanname* documents note the illumination dates. They state the dates of lighthouses beginning operations with locational information of the lighthouse and the attributes of the light. In *ilanname* documents, together with the location in longitude and latitude, the elevation of light from the ground and the range of light reflection on the ocean are stated.

In this chapter I dwell on the lighthouse line, which is the planned route of a series of lighthouses to be built, categorized according to the shore lighthouses located. I discuss the lighthouses listed in these documents according to the lighthouse line they belong to. In addition, I discuss the issues regarding the building process of lighthouses as an edifice. I also cover the navigational developments occurring at the beginning of the century, the second concession agreement, and the inauguration of the Suez Canal in the fourth chapter. The Suez Canal is considered one of the most significant infrastructure projects of this century in the maritime world, and the integration of the lighthouse network with the Suez project is articulated within the illumination of the Red Sea shores. This connection became a part of the renewal of the first lighthouse concession agreement in 1879. Between the Suez Canal and the second lighthouse concession agreement, I include an analysis of the lighthouse construction and use activity with the help of the table of Collas and Michel's net profits and the maps of lighthouses in the Mediterranean, the Indian Ocean, and the Red Sea in the year 1850 and year 1870 prepared by Barak.

In the fifth chapter, I start from 1879, two months after the second concession agreement with Marius Michel receiving the title of Pasha. I focus on construction activity at the other infrastructure in the investments of the holders of lighthouse building and operated concession together with the continuing lighthouse construction work. While I illustrate the connections among different types of infrastructure webs, at the same time I aim to demonstrate their peculiarities. These peculiarities are related to the complexities of the construction process of different types of infrastructure and their level of integration with the existing settlements. Since this thesis revolves around Marius Michel's life and career path, I will focus on

the diverse qualities of the lighthouses and quays which were Marius Michel's prominent works in the Ottoman Empire during the nineteenth century.

These investments are of different infrastructures, that are part of the infrastructure network facilitating the increase in maritime activity. Marius Michel also financed the concession of the construction and management of the Eminönü and Galata Quays. The investments of the other concessionary holder, Collas, consider two rail lines for investment. One of the lines was the Haydarpaşa-Izmit-Ankara railroad project, which also included the Haydarpaşa Quay. The other project considered for investment was the Jaffa-Jerusalem railway line to transport Hajj travelers arriving with the steamships after Hajj travel shifted mainly from land to sea. After displaying how these infrastructures facilitate the maritime traffic, much like lighthouses did for the maritime travel after the steam engine technology, I go back to the lighthouse building activity after the second concession agreement in 1879. This chapter includes a comprehensive evaluation of the lighthouse construction between the years 1870-1890. In this analysis, I benefit from the table showing the collected lighthouse fees and distributing these by country and other infrastructure projects. I end this chapter with the third concession agreement signed in 1894.

To wrap up, I aim to deliver an account of Marius Michel's career regarding the lighthouse construction and operation in the Ottoman Coasts during the second half of the nineteenth century, and how he became Michel Pasha with his works in the Ottoman Empire. While doing so, I also aim to trace other fragments of essential developments considering infrastructural development and lighthouse technology, I will attempt to deliver a broader image, which claims that maritime activity is directly correlated with lighthouse construction. Moreover, the lighthouse network is

part of the interlinked infrastructure network and an essential one, as an element of navigational practices

CHAPTER 2

NINETEENTH-CENTURY TECHNOLOGICAL DEVELOPMENTS REGARDING THE STEAMSHIPS AND LIGHTHOUSES

2.1 Introduction

This chapter will discuss two powerful frameworks to provide a proper context of the technological developments regarding steamships and lighthouses during the nineteenth century. These frameworks include the increased connections, in terms of both variety and frequency, of maritime routes due to technological developments; and, as a result of the first, the increase in the construction of lighthouses. Each frame will be considered on a global scale, and later the Ottoman narrative will be placed on the global scene. Before delving into these frames, I will provide a short introduction about how steam technology became part of the travel industry. I will also introduce the development of the steamboats and the arrival of the technology in the Ottoman Empire. This chapter will narrate why and how lighthouses were a significant necessity for steamship technology and an indispensable part of the infrastructure. Since lighthouses were both a byproduct of technological developments (steamship technology) and experienced technological developments themselves, the steamship technology and how much it shortened the distances and made the world smaller and more accessible is a vital underlying element in this study. Therefore, I would like to begin with steamship technology and its two significant outcomes: shortened distances and the new temporal framework that emerged with the technology, as travel was no longer seasonal, possibly extending to 24/7 availability. The main issue I will address is the intensified regularity of steamship transportation in the nineteenth century. I will also include the lighthouses

and their technological development to provide infrastructure for security and enable better navigation along the shores. In the first section of this chapter, I will investigate the technical development of steamships, emphasizing the temporal advantages they provided. Following, I will talk about the steamship companies from both the Ottoman Empire and other countries to show how maritime travel frequency increased globally and how this technology was used regularly from daily life to urban transportation in the Ottoman capital and provinces. My examination will be threefold in the global scale section: mail, passenger, and material transportation.

Here, I will also mention Marius Michel, emphasizing his work as the Near East Postal Service captain at Messageries Maritimes. After establishing the facts about frequent and intensified maritime transportation, I will move on to lighthouses' history and technological development. After a brief introduction to the history of lighthouses, from ancient times to their use in the nineteenth-century Ottoman Empire, I will touch on optical technology and the development of illumination source technology during the nineteenth century. I will conclude this chapter with the Crimean War since it was considered the event that led to an enhanced understanding of the importance and the superiority of steamships. Moreover, the Crimean War marks the beginning of the process leading to the contract to take Marius Michel into service as the General Director of Ottoman Lighthouses and the Ottoman government.

2.2 Steamship Technology Leading to Global Connections

The nineteenth century was dominated by the strong influence of technological developments, especially in steam technology, which led to a more connected world. Eric Hobsbawm considers steam as one of the most significant technological

triumphs of the first phase of industrialization, providing new modes of transportation through the railway and the steamship while being a medium of industrial expansion in terms of material trade and export.³² The first studies in steam technology were conducted in 1775 by James Watt, which played a crucial role in the industrial revolution. At the turn of the eighteenth and nineteenth centuries, the evolution of the steam engine was at its peak with Oliver Evans' high-pressure engine. The high-pressure steam engine enabled maximum performance with minimum equipment. This allowed mobile use on land and sea in the forms of locomotive and steamship, respectively.³³

This technology changed modes of travel significantly. The distances shortened; thus, travel became a different experience. To start with, new sources of power were needed to enable fast travel, as Mikhail remarks:

Ways were eventually found to replace water and wind with the energy of steam, but steam power was comparatively expensive and did not replace waterpower for all uses. While wind and water were free goods, fuel was required to produce steam.³⁴

The travel experience transformed entirely after the invention of the steamship.

Maritime travel was described in the late eighteenth century as so challenging that Dr. Johnson, a traveler, compares ocean travel in the days of sail before steamers with "being in a jail with the chance of being drowned." Another guide book from the second half of the nineteenth century, after the invention and proliferation of the steamer (or liner, named after the line like routes steamships travel), described travel as a posh experience with the following words: "The rush and worry of modern life has prompted the creation of luxurious floating hotels on the sea ... excellent for the

³² Hobsbawm, "*The Age of Capital, 1848-1875*".

³³ Schivelbusch, "*The Railway Journey*", 22-33.

³⁴ Mikhail, "*Water on Sand: Environmental Histories of the Middle East and North Africa*", 59.

health of the healthy as well as for that of invalids."³⁵ On the increased speed, Nile Green comments on the new modalities of travel as "regulators of the space and time."³⁶ In his book *On Time*, On. Barak remarks on this issue in terms of both the space-time compression created by the technological development ³⁷: "In less than two decades, between the late 1820s and the mid-1840s, travel time between England and India had shrunk to one month, and the distance between these two places imploded."³⁸ Moreover, he formulates this outcome of fast travel in two levels, in terms of change in the temporal understanding. The first level considers the introduction of the timetables and fixed departure and arrival times. The second level considers the time in which sea travel is possible, temporality no more depending on the wind and seasonal changes:

Like coal, wind was wedded to a particular temporality. Not unlike coal, it could be micromanaged with translations into money, space, and time. Yet such translations, for example the word monsoon, derived from the Arabic word for seasons (mawasim), reveal the difference in scale between calculi of wind and coal. The monsoon winds did not make sailing a whimsical matter; on the contrary, since the fifteenth century, careful registration of weather conditions dictated fixed schedules and itineraries. The monsoon weather system allowed sailing through the Indian Ocean in the spring and fall, compelling ships and merchants to wait in ports in between.¹⁴ Steamers, by contrast, could move year-round. Yet there was nothing inherently superior in the incessant (and by 1870, faster) motion of the steamer, compared to the significantly cheaper and more spacious sailing ship. As we now know, the competition was settled after the 1869 inauguration of the Suez Canal, which put the Mediterranean in direct contact with the Indian Ocean.³⁹

The first known continuous steam-powered boat was the Clermont, which Robert Fulton started operating on the Hudson River in 1807.⁴⁰ The first steamship to run on the open ocean was in 1816; it operated along the English Channel, between England

³⁵ Searight, *Steaming East: The Forging of Steamship and Rail Links between Europe and Asia*, 128.

³⁶ Green, *Spacetime and the Muslim Journey West: Industrial Communications in the Making of the 'Muslim World.'*, 401–429.

³⁷ For further reading on the space-time compression concept: Warf, Barney. *Time-Space Compression: Historical Geographies*. London; New York: Routledge, 2008.

³⁸ Barak, On. *On Time: Technology and Temporality in Modern Egypt*. 22

³⁹ Barak, *Powering Empire*, 26.

⁴⁰ Müller-Wiener, *İstanbul Limanı*, 78.

and France.⁴¹ Steamship technology was improving continuously throughout the century. The propeller of SS Archimedes, the first wooden ship equipped with a propeller, was invented by Francis Smith in 1838-39, and its spreading accelerated in 1863. Propeller-type technology allowed inserting the engine, which meant a ship could have both sails and an engine.

Furthermore, with this technology in the ships, after the placement of the engine, there would be enormous left-over space, which enabled the transportation of more oversized cargos and many passengers. The manufacturing of the first propeller ferries started in England after 1842. In England, in 1843, a trial of a propeller warship called Rattler was made. In France, the propeller ship named Napoleon was constructed in the same year, and the United States put the propeller ship named USS Princeton up for trial a year later.⁴² During the Crimean War, the propeller was accepted by the Ottoman naval bureaucracy. In the field of war, the speed of the propeller ferries surpassed the speed of the paddle ferries.

This technology arrived in the Ottoman Empire in less than 20 years following operations on the Hudson River in 1807. The first steamboat in the Ottoman lands was the ship named Swift, purchased from England in 1827. Due to its steam, local people called it *buğ*, which means "steam" in Turkish. This steamship was later primarily used for the travels of Mahmud II. The steamship was later renamed *Sûrat*, which means "speed" in Turkish. It was also used in warfare during the Crimean War in 1853.⁴³

⁴¹ Kuran, *XIX. Yüzyılda Osmanlı Devleti'nde Deniz Ulaşımı: İdare-i Mahsusa'nın Kuruluşu ve Faaliyetleri*, pp 159.

⁴² Rippon, *Evolution of Engineering in the Royal Navy*. 1827 - 1939.

⁴³ Tutel, *Seyr-i Sefain: Öncesi ve Sonrası*, 14.

The first steamship built within the Ottoman Empire was called Eser-i Hayır, which was built in 1837 at the *Tersane-i Amire* (Main Naval Arsenal). It was followed by the ships Mesr-i Bahri and Tahir-i Bahri in 1839. They both became the property of the new Sultan Abdülmecid. Tahir-i Bahri was used mainly for the service of Sultan Abdülmecid.⁴⁴ Later on, the ships Mesr-i Bahri and Eser-i Hayır were used for carrying passengers and cargos. Mesr-i Bahri and Eser-i Hayır steamships operated in Istanbul and in the Marmara sea respectively, working between Istanbul, Bandırma, Izmit and Tekirdağ.⁴⁵

The arrival of the steamships was conducted by, and therefore dependent on, the Ottoman navy. Some naval steamers carried civilian passengers as well as military personnel, but the ships were still predominantly destined for warfare. These steamships were part of the Hazine-i Hassa Vapurlar İdaresi, founded in 1844 under the Ottoman Navy and the *Tersane-i Amire*.⁴⁶

The steamships owned by the Ottoman Empire between 1852-1856 were sailboat-wooden ships with propellers mounted on their stern. The first boat considered for this application was the wooden Peyk-i Zafer Galleon, built in 1841 at Sinop. However, this idea was declined due to the technical difficulties of installation on a pre-built ship. Later, Şadiye and Fethiye galleons were constructed for this purpose. Their construction started in 1853.⁴⁷ These two galleons, which were built in accordance with the placement of the machinery and the propeller, were sent to England for the assembly of the machine, boiler, and propeller after the construction process was completed and returned to Istanbul after the engines were mounted on

⁴⁴ Tutel, *Seyr-i Sefain*, 29

⁴⁵ Koraltürk, *Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı*. 18.Langensiepen, Güleriyüz, and Cooper, *The Ottoman Steam Navy, 1828-1923*, 2.

⁴⁶ Koraltürk, *Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı*, 23.

⁴⁷ Bal, *XIX. Yüzyıl Buharlı Gemiler Dönemi: Osmanlı Bahriyesi*, 51.

the ships by Yani Bey. Considering propeller ships became widespread in England in the 1850s, the Ottoman Navy was not significantly behind.⁴⁸ The effect of the Crimean War regarding steamship technology is very significant since it demonstrated the importance of steamships. Even in the land battles, the troops were carried out with steamships. The Crimean War is also regarded as one of the most transforming events in the Ottoman Empire during the 1850s. In addition, the Crimean War was the first occasion when two major European powers, Britain and France, fought on the side of the Ottomans against the Russians.⁴⁹ This interaction affected the Ottoman Empire in many aspects, including maritime technology.

Steamships with propellers were replacing steamships with wheels. This is considered to be the leading development in maritime transportation. This was because the propeller offered a variety of advantages to steamers. To begin with, a propeller-type engine enabled inserting, which means a ship can have both sails and an engine. Furthermore, propellers took less space compared to the wheels in the ship, which permitted the transportation of a more significant number of passengers and goods. This meant that steamships could include naval cannons and be used for military purposes as well.

On the other hand, the propeller enabled the transformation of existing sailboats into steamboats. Equipment such as machinery, boilers, and propellers, required by steam technology, could be mounted on sailboat galleons, frigates, corvettes, and schooner-type ships. Most states showed great interest in this mode of transformation. The process of replacing the sail ships with steamships started in the 1840s and continued in the second half of the nineteenth century.⁵⁰ Finally, propellers offered more speed,

⁴⁸ Düzcü, *Yelkenliden Buharlıya Geçişte Osmanlı Denizciliği (1825-1855)* 127.

⁴⁹ Badem, *The Ottoman Crimean War (1853-1856)*, 1-45.

⁵⁰ Düzcü, *Yelkenliden Buharlıya Geçişte Osmanlı Denizciliği (1825-1855)* 59.

which made for a more connected world and radically decreased spatial distance.

Schivelbusch observes on this issue:

A given spatial distance, traditionally covered in a fixed amount of travel time, could suddenly be dealt with in a fraction of that time; to put it another way, the same amount of time permitted one to cover the old spatial distance many times over. In terms of transport economics, this meant a shrinking of space.⁵¹

This connectedness was visible in several aspects; Mail, Passenger, and Material transportation. I will talk about each of these aspects and their correlation with how steamboat travel intensified with the technological developments.

2.3 Companies and Aspects of Global Connections

The steamships, especially after the emergence of the steam-propeller, became widely used in transportation. In his dissertation on Railway Projects and Urban Architecture of Balkan Cities in the Late Ottoman Period, Tozoğlu highlights the speed and impact of steam technology as such:

The new invention not only provided the opportunity of carrying incredible amounts of passengers and goods in a short time between stations, but also enabled European countries to complete internal political, economic and military territorialization and standardization processes and set up new economic affairs with their surroundings and with overseas.⁵²

After the invention of the propeller in 1838, more steamship companies were founded. In 1837, Austria and in 1839, Great Britain established regular commercial routes for postal and holding service companies. The Lloyd Company and The British Peninsular and Oriental (P&O) Company structures comprised the first examples; thus, they became models for all commercial steam navigation

⁵¹ Schivelbusch, *The Railway Journey*, 50.

⁵² Ahmet Erdem Tozoğlu, "Actors of Change: Railway Projects and Urban Architecture of Balkan Cities in the Late Ottoman Period," 32.

companies.⁵³ The French company (Messageries Maritimes) was established later in 1851 because, unlike other countries, the Navy handled the postal administration for a long while. Since the state was handling this, a French Steamship company was not needed. Russia was the last among the French, English, Russian trio to establish a steamship company, with Russian Steamship and Trade Company (*Russkoe Obschestvo Parohodstva i Torgovli-Pysskoe Obshchestvo Parohodstva i Torgovli*).⁵⁴

The issue of the founding of the Ottoman Steamship Company is relatively more complex. Much like the French case, the Ottoman Navy provided the majority of the civic transportation, and all steamships were built and bought through the main naval arsenal. There were several companies and attempts for steamship transportation. Firstly, I will discuss the steamships' functioning for the civilian passenger, cargo transportation, and the transformation of this governmental institution within the main naval arsenal, Tersane-i Amire. Then, I will include the cases of the private companies, their operation areas, and some attempts to found private steamship companies. The Hazine-i Hassa Vapurlar İdaresi was established within the main naval arsenal as a governmental institution connected to the Naval Ministry. The first lines were between Istanbul, Izmit, Gemlik, and Tekirdağ piers operated in 1843. Later on, steamships operated on the Sirkeci-Adalar (Princes' Islands), Sirkeci-Yeşilköy and Sirkeci-Pendik routes starting from 1846. In 1863, the Hazine-i Hassa Vapurlar İdaresi became independent from the Ministry of Navy and was renamed Fevaid-i Osmaniye to operate under the Tersane-i Amire, providing civil shipping services (the steamships Eser-i Cedid and Eser-i Hayır were part of the

⁵³Uygun, "Osmanlı Sularında Rekabet: Mesajeri Maritim Vapur Kumpanyası (1851-1914)," 40-47.

⁵⁴ Mesut Karakulak, "Russian Steamship and Trade Company (ROPIT) and Ottoman-Russian Commercial Relations (1856-1914)," 1-19.

fleet with twenty steamships acquired from Hazine-i Hassa Vapurlar İdaresi, as it was renamed Fevaid-i Osmaniye). Gülerüz summarizes the operation areas of the Fevaid-i Osmaniye in three distinctive groups:

I- To neighbouring, shores (Sevahl-i Mücavere) covering the routes between Üsküdar, Kadıköy, Beşiktaş, the Princes Islands and Sirkeci. This included what we call today the "City Lines" or "Urban sea transportation". To these activities were added in 1851 the regular scheduled trips (4 times per day) between Üsküdar and Beşiktaş, served by the ships "Girit" and "Vasıta-i Ticaret". In the same year of 1851 a new organization, the "Şirket-i Hayriye" company (roughly: the Propitious Company) was founded, to which the Bosphorus Service was assigned. With the exception of the Üsküdar and Beşiktaş routes, which stayed with "Şirket-i Hayriye", all other routes to the neighbouring shores were assigned to Fevaid-i Osmaniye. Under the heading of neighbouring shores are to be mentioned the shipping routes between Köprü-Kadıköy, Köprü-Princes' Islands, which are even today among the most important sea routes of the city. Regular services on these routes were started in 1846.

II- To near shores (Sevahl-i Karibe), covering the routes to İzmit, Gemlik, Tekirdağ, Bandırma and Gelibolu on the shores of the Marmara Sea.

III- To distant shores (Şevahl-i Baide). Under this heading are included the routes to the Aegean sea, mainly to Izmir and Selanik (Thesaloniki), and to the Black Sea, the ports of Varna, Samsun and Trabzon. In the year 1860, Fevaid-i Osmaniye was operating on the following routes : Istanbul - İzmit, Istanbul - Mudanya - Gemlik, Istanbul - Silivri - Tekirdağ - Gelibolu, Istanbul - Midilli - İzmir, Istanbul - Selanik (Thesaloniki), Izmir - Sakız - Rodos, Izmir Girit - Sana- İskenderiye (Alexandria) and Beyrut.⁵⁵

In 1871, the Fevaid-i Osmaniye was renamed İdare-i Aziziye as a tribute to Sultan Abdülaziz, who cared deeply about sea transportation. In 1878, it was renamed the İdare-i Mahsusa under the reign of Sultan Abdülhamid II. In 1909, the İdare-i Mahsusa was purchased by a British company, but this purchase was canceled shortly afterward, and the institution became Osmanlı Seyr-i Sefain İdaresi (Ottoman Navigation Administration) in 1910 and sustained its services until 1923.⁵⁶ There were several attempts to establish steamship travel detached from the Navy.⁵⁷

⁵⁵ Gülerüz, *İstanbul Vapurları (Istanbul ferries)*, 26.

⁵⁶ Koraltürk, *Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı* 88.

⁵⁷ Gülerüz, *İstanbul Vapurları (Istanbul ferries)*, 23-26.

The Peyk-i Şevket steamship was the first attempt to provide steamship service between Istanbul and Izmir. The ship was built in France at the port city La Ciotat, more specifically at the arsenal of the Chantier Benet in 1836. Peyk-i Şevket was a "wooden bulled side paddler ship" built to carry both passengers and charges. It operated for 14 years on the Istanbul-Izmir line and, at some unknown point, worked for the postal service of the Princes' Islands.⁵⁸

The Ottoman steamship company Şirket-i Hayriye, aiming to provide transportation and to set an example as the first private company of the Ottoman Empire, was founded in 1851. It was founded by the undersecretary of the vizier (sadaret müşteşarı) of the time Fuad Paşa, and the previous minister of justice (Adliye Nâzır-ı Esbakı) CevdetPaşa.⁵⁹ The steamships of the Şirket-i Hayriye operated along the Bosphorus. The company Şirket-i Hayriye ordered its first ships from England. These ships were named Rumeli, Tarabya, Küçükusu, Beylerbeyi, Tophane and Beşiktaş. As soon as the four of these six requested ships reached Istanbul, they set out on a voyage in April 1852. The first voyages were carried out to Üsküdar. During this period, ships did not approach the shore; as there were no quays to go onboard. Passengers, who could cross a distance close to the coast with the ferries, were transported to the coast by boats or barges.⁶⁰ Other than transportation along the Bosphorus, the company offered military support to the Empire by supplying troops with materials during times of war.⁶¹ One of the issues brought up about the establishment of the Şirket-i Hayriye was the possibility of confusion between the company and the Fevaid-i Osmaniye. The solution for this

⁵⁸ Koraltürk, *Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı* 24.

⁵⁹ Ergin, *Mecelle-i Umûr-ı Belediyye*. 2288.

⁶⁰ Levent Kaya Ocakaçan, "Birinci Dünya Savaşı'nda Şirket-i Hayriye," 20.

⁶¹ Ahmet Erdem Tozoğlu, "Actors of Change: Railway Projects and Urban Architecture of Balkan Cities in the Late Ottoman Period," -46.

issue was to separate the operational areas.⁶² The Fevaid-i Osmaniye would operate on the Mediterranean and the Black Sea, while the Şirket-i Hayriye aimed only to provide ferry transport along the Bosphorus. Kadıköy and Pendik, the Anatolian side of the Istanbul and distant Rumelian settlements onshore such as Yeşilköy and the islands were left to the Fevaid-i Osmaniye.⁶³

Other companies were worth mentioning, such as the İdare-i Nehriye, the Hamidiye Ferry Company, and the Haliç Ferry Company. The İdare-i Nehriye was established in 1863 by Midhat Pasha, who was appointed as the Governor of the Danube during the reign of Abdülaziz to carry out transportation on the Danube River. Since it was a private company, it carried passengers and freight without any assistance from the state.⁶⁴ Shortly after, the voyages started with two ferries, and then two more steamers were added. Seven ferries were operating with the order of two postal ferries from Vienna in 1869.⁶⁵ The Hamidiye Ferry Company was established in 1884 by granting a concession to Yahya Efendi, a merchant from Izmir, for operating ferries in the Gulf of Izmir. According to the contract, consisting of twenty articles, the concession of operating ferries among Old and New Foça in Izmir Bay, Alaybeyi, Osmanzade, Donanmacı, Karşıyaka, Izmir, Karataş, Islahhane, Göztepe, Abdullah Ağa Farm, Kilizman, Urla, Karaburun piers and regular passenger transport to Çeşme, Ilıca outside the gulf is given to Yahya Efendi. Yahya Efendi was granted a concession for thirty years to build the piers and pontoons that needed to be constructed. In 1884, six months after the concession was granted,

⁶² Koraltürk, *Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı* 24.

⁶³ Koraltürk, *Buharlı Vapurlardan Deniz Otobüslerine İstanbul'da Deniz Ulaşımı* 21.

⁶⁴ Kızıldemir, *İlk Buharlı Geminin Türkiye'ye Gelişi ve Türk Deniz Ticareti Resmive Özel Kuruluşları*, 32.

⁶⁵ Kütükoğlu, "Osmanlı Buharlı Gemi İşletmeleri ve İzmir Körfezi Hamidiye Şirketi." in *Çağın Yakalayan Osmanlı! Osmanlı Devleti'nde Modern Haberleşme ve Ulaştırma Teknikleri*, ed. Ekmeleddin İhsanoğlu and Mustafa Kaçar.

Hamidiye Company ferries started their voyages. The voyages of the company consisted of two parts: in-gulf and out-of-gulf. The company tried to continue these expeditions until the beginning of the Tripoli War in 1911.⁶⁶ The Haliç Ferry Company, on the other hand, was founded in 1856 by Ahmed Fethi Pasha, the Marshal of the Imperial Arsenal (Tophane-i Amire Müşiri). Ahmet Fethi Pasha is also considered to be the founder of the Ottoman Imperial Museum. In 1846, Ahmet Fethi Pasha established the Ottoman Empire's first museological presentation of imperial collections. The two collections owned by the Sultan were displayed in the chambers around the atrium of the former Church of Hagia Irene. This collection is considered the foundation of the first Ottoman Imperial Museum.⁶⁷ Ahmed Fethi Pasha received a concession for operating ferries on the Golden Horn for twenty years. Ahmed Fethi Pasha started to work with three ferries. With his death in 1857, the privilege of the company passed to his son Mahmut Celalettin Pasha. Another ten years of concession was granted later. It was given fifteen years before the first concession was to end. The company was integrated into the Istanbul Municipality in 1935.⁶⁸

Moreover, there were two other companies, which ended up as mere attempts; yet, they are nonetheless worth mentioning. These are the Osmanlı Şirketi (the Ottoman Company) and İdare-i Umman-ı Osmani (Ottoman Administration of Oman). The former was established by Midhat Pasha, like the İdare-i Nehriye, in 1869, after Midhat Pasha was appointed as the Governor of Baghdad. However, this company did not survive after Mithat Pasha left the position.⁶⁹ There was another

⁶⁶ Kütükoğlu, “OsmanlıBuharlıGemiİşletmelerive İzmir KörfeziHamidiyeŞirketi.”.

⁶⁷ Shaw, *Possessors and Possessed: Museums, Archaeology, and the Visualization of History in the Late Ottoman Empire*, 46.

⁶⁸ Koraltürk, *Haliç'teUlaşımveHaliçVapurlarıŞirketi, 1909-1941*, 18. Ergin, *Mecelle-iUmûr-ı Belediyye*, 2288.

⁶⁹ Tutel, *Seyr-İ Sefain*, 82.

attempt to start a steamship company on Lake Van. In a late (after the first efforts) report on this issue in 1887, the benefits of the ferry are stated. These benefits concern shortening of the travel time, with exact time differences. The report stated:

A ferry is strongly needed in order to facilitate the transportation of all kinds of goods and supplies from the towns and districts of Gevaş, Bitlis, Ahlat, Adilcevaz, Erciş and Bargirli, on the coast of Lake Van, to and from Van to said districts. The inhabitants of the mentioned towns and districts; passengers and caravans traveling from Erzurum to Van and vice versa; soldiers and police soldiers dispatched from Van all stated that they went half the seventy-two hour trip for basically no reason. However, if the ferry were to operate, the thirty-six and sometimes forty-hour distance from Van to Adilcevaz or Ahlat towns would be passed in less than half the time. Thanks to its operation, they would come close to each other and each one will develop in a short time.⁷⁰

This report explained the significance of steamship technology in terms of how it can shorten travel time. Moreover, this time difference did not occur on an entire maritime travel, but happened on a small web of otherwise land routes, which has an enormous lake in the center. The steamship technology could influence the inland provinces by cutting half of the travel time. The efforts for the company were started in 1878 by two Armenians called Artin Sarrafyan Efendi and Abraham Haffafyan Efendi. They presented a petition concerning a company operating on Lake Van to transport passengers and materials with steamships to the Public Works Department of the Council of the State on April 6, 1878. Upon this, the required agreement and conditions (şartname) were sent to the Ministry of Public Works. On August 4, 1879, this "mukavelename ve şartname" was read in the Meclis-i Mahsus, stating a 40 years long concession for the operation of the ferries on Lake Van made it a condition for the state to approve the internal regulations of the company, named the Ottoman Company.

⁷⁰ Abdulvasi Çetkin, "Van Gölü'nde Osmanlı Şirketinin Vapur İşletmeciliği Teşebbüsleri." 5-13.

However, Çetkin points out that this company has never officially operated according to the archive documents. This is also visible considering the state's constant delaying of this work. The only reason for the delay was the approval of the company's bylaws. Consequently, the operation could not start. According to Çetkin, the government postponed the work intentionally because the benefits of running ferries on Lake Van should have been under the state's name. As a matter of fact, this situation can be understood from the statement in the sixteenth article of the contract signed between the company owners and the state: "If the Government deems appropriate for their needs, it shall have the right and authority to operate ferries on Lake Van." This article shows how the state brought certain limitations to the concession granted. Since the operation of ferries on Lake Van could not be activated by the concessionaires, the government focused on this issue and decided that the state should carry out the operation of ferries on Lake Van. After 1887, the concession was ended, as if to prove Çetin's view.

The Governor of Van, İbrahim Halil Efendi, clearly expresses the necessity for state-owned steamboat management on Lake Van in his report submitted to the Ministry of Internal Affairs on May 31, 1887. After the report, a commission examined the situation and decided to cancel the concessions. As cancellation compensation, the commission chose to pay for the concession holders and operate two military ships on Lake Van. A year later, the Governor of Van, Halil Bey, sent a telegram to the Sublime Port, stating that the military shipments were also slow and the interruption of commercial activities since ferry transportation was not activated due to the suspension of the state. Upon this, a commission consisting of İbrahim Mahmut Hamdi, Rıza, Esseyid İsmet and Esseyid Muhammed Efendi was established, and as a result of the investigations, the following decision was reached:

"Considering the benefits of ferry transportation on Lake Van, it is more appropriate to operate two ferries previously intended for military shipment, rather than granting concessions to a company." This certificate presented by the commission was accepted on September 16, 1888.⁷¹

The aftermath of steamship technology became more prevalent with the establishment of commercial routes. The steamship companies can be thought of in several categories. Karakulak categorizes the trade and economic aspects as transportation of mail, passengers, and passengers' large charges of materials (cargos) for the case of the Russian Steamship Company and Ottoman State interaction. This classification can also be considered for the other steamship companies. I will use these categories to illustrate the intensity of maritime transportation as the outcome of steamship technology.⁷²

2.3.1 Mail-Postal Service

Steam technology had a vast effect. The effect was initially visible on the postal service. Mail transportation also has chronological links to the early technology of the steamboat as, due to the size of the first steam engines, only mail could have been transported with steamships. Aside from the speed advantage, steamships had some carriage limitations, so they were initially only used for postal services. These limitations were related to the volume of the steam power structure, which only enabled the transportation of mail. Until the arrival of the steam-propeller, mentioned above, the main focus of steamship transportation was postal services. Uygun

⁷¹ Abdulvasi Çetkin, "Van Gölü'nde Osmanlı Şirketinin Vapur İşletmeciliği Teşebbüsleri." 38-49.

⁷² Mesut Karakulak, "Russian Steamship and Trade Company (ROPIT) and Ottoman-Russian Commercial Relations (1856-1914)." 1-19.

emphasizes the importance of mail transportation in the context of the technological revolution and quotes the French Minister of Economy of the time in 1835:

The journey by sailboats from Marseille to Istanbul would normally take 40 to 50 days, now a steamboat from Marseille to Istanbul would complete its round trip in 28 days. In other words, the reply of a letter sent to Istanbul came on the 29th day. On the other hand, thanks to this revolution in the postal ships, diplomatic and commercial relations with the Levant were becoming more regular and tighter.⁷³

This comment was not a coincidence; the steamship travel with the Levant indeed became more frequent after the first successful voyage of the company was to the Levant and Istanbul. Eastern Mediterranean voyages were the main focus of the *Messageries Maritimes* Company. Connections aimed mainly at Alexandria, Beirut, Mersin, Izmir, Thessaloniki, and Istanbul. I would like to highlight the Thessaloniki line because one of the captains on this route will be a central point later in this study. With the agreement made with the Greek government by the *Messageries Maritimes* Company on April 15, 1852, a regular connection was established between all Greek shores/ports and France. According to this agreement, the *Messageries* steamers would make regular voyages, once a month, between Chalcis, Naples, Maratosino, Kalamata, Piraeus, and the Ottoman port of Thessaloniki, departing from Marseille. *Messageries Maritimes* Company made its first voyage to Thessaloniki with its steamer named Eurotas under the command of Marius Michel.⁷⁴

Kobe can constitute another example of how fast the connections were made with routes with an increasing number of stops. Furthermore, through the Kobe example, I can display the point steamship reached on a global scale. The mail company also had the first ship from Europe (named Iris, departing from Hamburg)

⁷³ Uygun, *Osmanlı Sularında Rekabet*, 33.

⁷⁴ Uygun, *Osmanlı Sularında Rekabet*, 56-67.

in the late 1860s, which arrived at Kobe. After Pacific Mail Company added Kobe to its steam service two months after the first ship, between Shanghai & Yokohama and from there across the Pacific to San Francisco, the importance of the steamship increased significantly, and it was more commonly preferred for passenger transportation.⁷⁵ The maritime travel reached the furthestmost places, and the frequency of the steamship services grew rapidly.

2.3.2 Passenger Travel

Hobsbawm points out that "*The middle of the nineteenth century marks the beginning of the greatest migration of peoples in history.*" He also divides long-distance passengers into two main categories: travelers and migrants.⁷⁶ Gelvin and Green point out the relation between the rise of steam power and the increase in passenger transportation: "*Rail and steam enabled the expansion of trade and migration to a degree never achieved. In the 1830s, it took forty-eight days to travel from Liverpool to New York under sail and thirty-six days to return. With steam, the voyage took fourteen days each way.*"⁷⁷

In addition to globetrotters and a minor stream of merchants, another aspect was the hajj and the transportation of the pilgrims to the holy cities in the Hijaz. This section will focus on traveling and globetrotting since their byproducts provide sources to illustrate the connections of technology and transportation with the spatial nodes and infrastructures on a global scale. Again, Gelvin and Green suggest this connection with the following words: "*The advent of railroads and steamships also made Muslim societies accessible to European adventurers, missionaries, settlers,*

⁷⁵ Green, *Terrains of Exchange: Religious Economies of Global Islam*, 242-247.

⁷⁶ Hobsbawm, *The Age of Empire, 1875-1914*, 228-244.

⁷⁷ Gelvin, and Green, "Introduction" in *Global Muslims in the Age of Steam and Print*, 1-25.

scholars, and tourists (a term coined in the second decade of the nineteenth century)."⁷⁸ In the same book, printing technology and steam engine technology are discussed together. As a part of passenger transportation and travel, related productions such as photography and print (in this case, the travelogues as well as the travel guide books) increased significantly. Printing and photography are two other technological developments to consider in line with steam technology. In order to do so, I will provide three examples of travel byproducts: the printed texts and photographs concerning traveling such as travel guidebooks and travelogues and touristic photographs; one of which will be from the book edited by Gelvin and Green. All three creatively illustrate how steam technology rendered long-distance traveling a more common activity. The first example is from the book *Age of Print and Steam*, the chapter of Prestholdt, which includes a travelogue that discusses the centrality of Zanzibar: "By the mid-1860s, ships from virtually every western Indian Ocean port could be found at Zanzibar, alongside others from the United States, Egypt, Turkey, Portugal, Denmark, France, Britain, Germany, and even Argentina." This quote clearly illustrates the level of connectivity in the mid-1860s.⁷⁹

Pérez Gonzalez suggests that the increase in steamship travel, especially in the form of tourism, is also visible through the rise of photography studios in port cities. She claims that since port cities were the arrival points of the steamships, they were also photography centers. She sets Egypt along with Japan and China as one of the many examples of this. The case of Egypt begins to be visible in the aftermath of the opening of the Suez Canal in 1869. This period is also considered to be the golden age of photography in Egypt. I would like to add here that one of the three

⁷⁸ Gelvin, and Green, "Introduction" 1-25.

⁷⁹ Jeremy Prestholdt "From Zanzibar to Beirut: Sayyida Salme Bint Said and the Tensions of Cosmopolitanism." 185-204.

photographed lighthouses in the Abdülhamid Collection is the lighthouse of the Port Said. Pérez Gonzalez's study also contains critical information regarding the increasing intensity of the steamship routes.⁸⁰ She presents travel guidebooks as a source to trace this increase. One aspect is their timelines, especially two publishing houses of travel books in nineteenth-century England: John Murray and Karl Baedeker. Another aspect to track is the timetables and route maps narrated and illustrated in the guidebooks throughout the nineteenth century.⁸¹

Travelogue of Europe (*Avrupa Seyahatnamesi*) consists of travel notes of a medical doctor, writer, and historian Hayrullah Efendi in Europe, where he visited twice, in 1862 and 1864. In this travel book, Hayrullah Efendi narrates his travel in a very detailed manner; he even mentions alternative companies to choose from and their timetables. For example, on his trip to Paris, he narrates:

It is a journey from Lyon to Paris, Lyon with a journey from Istanbul to Marseille. If you go to Marseille, the journey from Istanbul is like a trip to Trieste. However, the ferries to be related to are not the Llyod company of Austria, but the MESSAGÉRIES company of the French.⁸²

2.3.3 Material

The transportation of large cargo is a fundamental element of maritime transport. Evidently, the transportation of large cargos is a necessity due to its strong correlation with trade. In Mikhail's book, *Nature and Empire in Ottoman Egypt*, another aspect of the steamships and increasing travel is stressed: the infrastructure. Arrangements for constructions and materials are required for a steamship to board the land. Steamboats need modern quay infrastructures in order to approach any

⁸⁰ Pérez González, *From Istanbul to Yokohama: The Camera Meets Asia, 1839-1900*, 27-48.

⁸¹ Pérez González, *From Istanbul to Yokohama: The Camera Meets Asia, 1839-1900*, 27-48.

⁸² Hayrullah Efendi, *Avrupa Seyahatnamesi*, 61.

settlement, which requires ample amounts of wood for their construction.⁸³ The wood obliged for quays was brought with the very same steamships that required the quay. Other than wood, steamships also carried stones from quarries for quay constructions. For the Istanbul quays, the first Galata Quay construction started in April 1892, and later at Eminönü Quay, construction began in 1894 and quarries were opened. The quarries are located in Istanbul (Fındıklı, Kağıthane, and Silahtar) and its surroundings (Kınalı, Hayırsız, and Burgaz Islands) to supply marine filling material. During the construction of the quays of Istanbul, along with the need for stones from quarries, tugboats were ordered to transport material from the quarries nearby. The construction of the Galata docks started in 1892 under the rule of M. Duparchy and M. Diricq.⁸⁴ Construction sites included stone processing workshops and warehouses, which were established in Fındıklı, Kağıthane, and Silahtar. The company also caused urban change with the quarries it operated in Istanbul. However, the environmental damage and air pollution during the operation of the quarries, especially in the Princes' Islands, caused an increase in complaints.⁸⁵ These complaints tell us that the stones from the quarries on the nearby islands were transported via steamships. The problems that arose between the Rıhtım Company and the Ministry of Pious Foundations (Evkâf-ı Hümâyun) regarding the mines operated in Kınalı, Hayırsız and Burgaz Islands were referred to the court, and the case that continued for a long time resulted in the company offering peace to the custody in return for 5,000 Ottoman liras. Indeed, these ships were vital to the Ottoman Empire since they carried construction material, commercial goods, and food. This section concludes how the aftermath of steamship technology led to an

⁸³ Mikhail, *Nature and Empire in Ottoman Egypt: An Environmental History*, 170-201.

⁸⁴ Bilge, Zihni. *İstanbul Rıhtımlarının Tarihçesi*, 12.

⁸⁵ Örenç, *Modern İstanbul Limanı'nın İnşası Sürecinde Galata ve Eminönü Semtlerinde Kentsel Değişim*, 205-258.

intensity of travel routes and the transportation of goods, passengers, and mail. In the next section, I will focus on the frame regarding the developing lighthouse technology until the nineteenth century. I will explore the links between global connections and the establishment of the infrastructure network of lighthouse lines to support the increased maritime traffic. At the same time, I will discuss the technological development of the lighthouses themselves.

2.4 From Steamship to Its Infrastructure: Lighthouses

There is a major increase in maritime transportation in terms of both intensity and variety, starting mid-nineteenth century. So far, I have described how steam technology has led to extensive innovations in transportation and its outcomes in various aspects. In this section, I would like to start by illustrating the increase in ownership patterns and steamships with three examples of figures. The first one is a table demonstrating steamship ownership of Britain, France, and Russia between 1835 and 1860. It is shown in this table (*Table 1*) that in 25 years, Britain, France, and Russia had a drastic increase in the number of steamships they owned. The decrease in numbers for Britain and France occurs between 1850-1855, probably due to the Crimean War (1853-56). This table also supports the idea that the Crimean War created an understanding of the importance of steamships, especially in warfare. Sarah Searight claims the importance of steamships in warfare concerned the naval forces and all of the military forces since these steamships transported soldiers as well.

Table 1 Number of Steamships Owned by England, France and Russia⁸⁶

In year	1835	1840	1845	1850	1855	1860
Number of Steamships that Belonged to Britain	10	7	78	127	96	616
Number of Steamships that Belonged to France	9	3	82	105	91	353
Number of Steamships that Belonged to Russia	1	6	18	19	36	116

Steamships were used not solely for military purposes but also for commerce, especially after the steamships became more regularly used during the second half of the nineteenth century. Iordachi, in his study, examines this frequency and the increasing establishment frequency of global commerce networks in the case of Danube and demonstrates the improvement with figures:

The internationalization of the Danube and the major improvement in naval conditions resulted in a rapid growth of commercial activity. According to the statistics of the commission, 3,015 ships exited the river in 1862, transporting a total of 450,014 tons of goods; 3,099 ships exited in 1863, carrying 519,332 tons of merchandise; 3,448 ships exited in 1864, with 585,894 tons. In 1866, the fleet of riparian states had an important share in the total trade activity, such as Turkey with 437 ships and 36,785 tons of carried goods; Russia with 103 ships and 20,910 tons; and the United Principalities with 53 ships and 6,096 tons. Apart from the riparian states, the most important fleets belonged to Greece, with 1,053 ships and 136,922 tons of goods; England with 243 ships transporting 82,679 tons; Italy with 205 ships transporting 50,035; Austria with 204 ships and 60,932 tons; Norway with 37 ship and 12,196 tons; and France with 40 ships and 5,104 tons, followed by Sweden, Prussia, Serbia, and Denmark. In the same year, 361 ships carrying 133,934 tons transited the port city of Sulina, indicative of the city's importance for the Danubian trade. Under the direct jurisdiction of the Commission, Sulina obtained in 1870 the status of portofranco, meaning that all merchandise exported was exempt from taxes. This policy resulted in an impressive growth of the amount of goods exported, from 3,761,167 tons in the period

⁸⁶ Düzcü, "A Maritime Example of the Ottoman Transition to the Industrial Age: Main Parameters of the Transition to Steamship (1828-1856)," 113-127.

between 1871 and 1875 to 15,806,932 tons in the period between 1906 and 1910, thus multiplying more than fourfold in 35 years.⁸⁷

The overall maritime commerce grid reveals dramatic figures; the merchant fleets of the world had a capacity of 9 million tons in 1850. Sixty years later, in 1910, it almost quadrupled with a capacity of 34.5 million.⁸⁸

The technology meant another level of connection. Four-month journeys came down to two months. The number of routes increased in terms of intensity and variety; carrying mail, large charges, and passengers. As a result, the necessities of maritime transportation became more apparent. The steamships required navigation and an arrival point. Thus, the quays and lighthouses, in the modern sense, became more of a prerequisite. The quay projects and lighthouses were interlinked with the growing volume of international sea trade, fueled by the technological development of the steamships. As a result of this intensity of transport, certain problems and a need for infrastructure arose.

Quay and lighthouse construction projects constituted the infrastructural background for the intensifying network of steamship routes. The ports were the nodes of this network, acting as the places of departure and arrival. The lighthouses, along with the quays, were equally integral fragments of port infrastructures. The network of railroads also complemented ports. Lighthouses were a part of this interlinked structure; furthermore, they provided safety for steamship transportation. This was, thanks to the lighthouses, both enabling navigation and preventing accidents in the sea. Lighthouses were a necessity for maritime transportation because they were essential to the infrastructure for securing the oceans.

⁸⁷ Iordachi, "Global Networks, Regional Hegemony, and Seaport Modernization on the Lower Danube." 168.

⁸⁸ Michael Pearson, *The Indian Ocean*, 193.

The impact of infrastructure played a significant role in providing global connections. It influenced both economic and strategic terms. In the Ottoman case, the economic impact goes further than just facilitating the maritime trade; it was a part of the integration of the global economy since construction processes included foreign direct investments to the Ottoman Empire. Foreign direct investments were an additional dimension. European companies started to found enterprises within the borders of the Ottoman Empire (These European companies appealed to the Ottoman government to obtain the necessary concessions.) This continued from the 1850s up to World War I, and the total investment was roughly 75 million British pounds.

Interestingly, two-thirds of this, minus the foreign debt of the Ottoman state, was invested in railway companies. Ninety percent of the investments went into other infrastructural elements, both physical, such as ports and municipal services, and institutional, such as banks.⁸⁹ The infrastructures on the global scale emerged as powerful platforms for enabling maritime trade, tourism, and cultural interactions and strategic importance for the military, providing connections.

Metaphorically, the railway network became the creator of relation-network among actors. The relation network defined here is much more intricate, complex and dynamic than the physical railway network.⁹⁰

At this point, I would like to draw a relatively more general frame of the network mentioned by explaining the different aspects of this dynamic and providing a background of the arrival and the diffusion of steamship technology. After this point, I aim to focus on a specific technology that supported and provided infrastructure for this network, enabling it to expand and work better: lighthouses.

⁸⁹ Pamuk, *Uneven Centuries: Turkey's Economic History since 1820*, 117.

⁹⁰ Ahmet ErdemTozoğlu, "Actors of Change: Railway Projects and Urban Architecture of Balkan Cities in the Late Ottoman Period.", 10.

2.5 The History of Lighthouses Before and After Nineteenth-Century Technology

*"In a parallel process [to railroads], construction of high-capacity harbors and availability of steam-engine freight ships increased maritime traffic volume higher than ever before."*⁹¹ Steamships were a major part of the industrial revolution, linked to maritime transportation and the Navy. Sea transport, like coastal security and lighthouses, was of course not a new development. The increasing amount of lighthouse construction was an expression of industrial development, in a similar fashion, to the other infrastructural developments. For example, the Bell Rock lighthouse, which sits off the coast of Scotland in the North Sea, is considered one of the seven wonders of the industrial world.⁹²

The oldest lighthouse in history is believed to have been built in Sigeion (Kumkale) at the junction point of the Dardanelles Strait to the Aegean Sea, in the 7th century BC.⁹³ The first lighthouse mentioned in documents was the Pharos of Alexandria, erected during the reign of King Ptolemæus Philadelphus around 280 BC.⁹⁴

The Lighthouse of Alexandria was mentioned in the Iliad: *"As to men o'er the wave borne The watch-fire's light which, high among the hills, Some shepherd kindles in his lonely fold."*⁹⁵ It is also illustrated in Moğmal-ot-Tavârîhva'l Qasas manuscript in ca. 1475, now at the Heidelberg University Library.

⁹¹ Schivelbusch, *The Railway Journey*, 22-33.

⁹² I have come across with such expression in dissertation of Hannah Collway; "Illuminating Science: The Lighthouse as Public Good and The Role of the Scientific Expert in Nineteenth-Century British Lighthouse Reform" 2015. The other wonders are: The Transcontinental Railway, The Brooklyn Bridge, Bazalgette's London sewers, The Great Eastern, The Panama Canal and The Hoover Dam.

⁹³ Davenport, *The Story of Our Lighthouses and Lightships: Descriptive and Historical*, 1-31.

⁹⁴ Davenport, *The Story of Our Lighthouses and Lightships: Descriptive and Historical*, 1-31.

⁹⁵ See the passage in Homer ("Iliad," xix. 375)

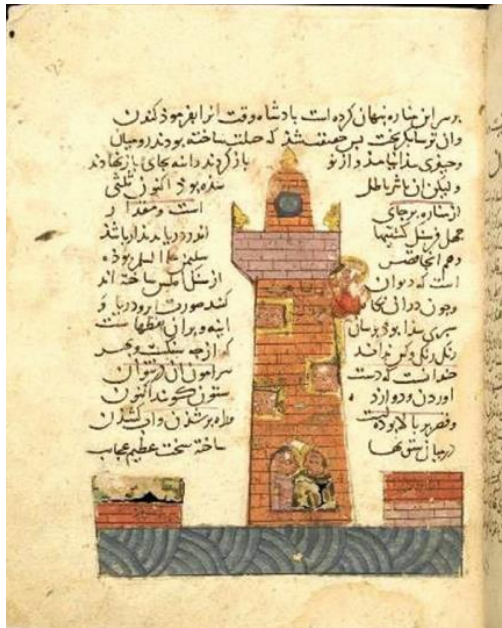


Figure 1 Lighthouse of Alexandria miniature in Moğmal-ot-Tavārīhva'l-Qaşaş ca. 1475⁹⁶

Davenport, in his study on lighthouse history, also mentions an early description of a lighthouse in Constantinople, from the work of Dionysius of Byzantium (2nd Century AD), called *Byzantiou Anaplous Bosporou*, which portrays the Bosphorus and the city of Byzantium:

Dionysius of Byzantium describes a celebrated lighthouse planted at the mouth of the river Chrysorrhoas, where the latter mingles its waters with those of the Thracian Bosphorus (the modern channel of Constantinople). "On the crest of the hill," he says, "the base of which is washed by the Chrysorrhoas, may be seen the Timean tower, of an extraordinary height; and from its summit the spectator beholds a vast expanse of sea. It has been built for the safety of the navigator, fires being kindled for their guidance; which was all the more necessary because the shores of this sea are without ports, and no anchor can reach its bottom."⁹⁷

The Anatolian and Rumelian lighthouses were also mentioned in the account of Istanbul by Pierre Gilles in 1544.⁹⁸ According to the account of Kōmürçiyan in

⁹⁶ Moğmal-ot-Tavārīhva'l-Qaşaş, ca 1475, Universitätsbibliothek Heidelberg. MS.Cod. 118/0550, fol.273a.

⁹⁷ Dionysius, Dionysius, of Byzantium, and Carolus Wescher. *Dionysiou Byzantiou Anaplous Bosporou*. Paris: E Typographeo publico, 1874. Quoted in Davenport, *The Story of Our Lighthouses and Lightships: Descriptive and Historical*.

⁹⁸ Gilles. *Anaplous Bosphori Thracii*, 165-166.

seventeenth-century Istanbul, the first lighthouses were Rumelian lighthouses, Anadolu Lighthouse and Fenerbahçe Lighthouse. According to his account, depiction of the Fenerbahçe lantern is as follows:

The field extending from Kadiköy to Fenerli garden (Fenerbahçe) is covered with vineyards that caress the eyes. Here, in front of the mansion, the text thrown into the sea is like a monolithic statue on a foundation. The lantern is burning on the top of the tower. Garden and pavilion can be seen from half a day's distance is remembered with the name of this lighthouse. Lantern, to protect ships from crashing into rocks, every night in the morning shines up like a star. Opposite this Sultan's garden full of sycamore and cypress trees, there is a beautiful mansion that stretches into it and can be seen from all sides. Coming from the Mediterranean and Izmit and All the ships going to Istanbul are contacted by this garba mansion. Falling on the back of the lantern the coastal road is the Izmit road.⁹⁹

The lighthouses became more relevant during the eighteenth century, and the first footsteps of the modern lighthouses were being felt. The first stage in the development of lighthouse technology was replacing the wooden materials with stone. The Eddystone Lighthouse, built dated 1759 in Cornwall, England, is considered to be the first modern lighthouse in the open sea in a stone lattice. It has had several modifications and eventually became the Bell Rock.¹⁰⁰ The lighthouse technology was developing during the beginning of the nineteenth century.

In 1822, a French engineer called Augustin Fresnel invented the reflective lens, which made it possible to extend the reach span length of light. Traditional lighthouses were basically beacon fires, which lit at night on high towers along the shores of the sea, aiming to guide mariners at nighttime and to provide safe travel. Modern lighthouses as we know them originated with Fresnel's innovation in illumination. This innovation was made while Fresnel was in the French lighthouse commission of Napoleon III. He was added to this commission's ranks due to his experiments on the wave theory of light. Although Christiaan Huygens first brought

⁹⁹ Kömürcüyan, *XVII. Asırda İstanbul*, 14.

¹⁰⁰ Stevenson, *Lighthouse Construction and Illumination*, 13

the theory in the late seventeenth century, it was overshadowed by Newton's corpuscular theory of light (1704). This was until 1802, when Thomas Young conducted the double-slit experiment (also known as the interference experiment, one of the earliest studies to consider the wave theory of light over Newton's corpuscular theory of light, if not the first). Fresnel conducted his experiments between 1814-1818, which were initially focused on diffraction. Continuing his work, he introduced the concept of wavelengths, deriving from the Huygens principle, and articulating the mathematical framework for diffraction intensity calculations.¹⁰¹

Fresnel became a part of the lighthouse commission in 1818. He worked on the lens while serving in this commission. His model is widely used in modern lighthouses today, known as the Fresnel lens, invented between 1819-1825. His work is a continuation of Georges de Buffon's idea in 1748 that only the outer surface of a lens is needed for the bending of light, which could lower the cost of the traditional two-sided lenses. Two-sided lenses were very large and heavy, as well as expensive. Fresnel devised multi-part lenses to operate in lighthouses.¹⁰² In 1823, the first full-scale test was conducted in Paris on the Arc de Triomphe. The light was visible from 25 kilometers away, which surpassed all expectations¹⁰³

His invention was a particular system of lenses which was then called the echelon or lighthouse lens. It is called the Fresnel lens today. This arrangement consists of a plano-convex lens made of eight or ten glass halos. Several mirrors are placed over and under these halos. This system transmits the light in great amplitude. Moreover, Fresnel arranged these lenses in the form of an octagonal glass prism, in

¹⁰¹ Basdevant, "Famous Optician: Augustin Fresnel and the Wave Theory of Light," 18–22.

¹⁰² Basdevant, "Famous Optician: Augustin Fresnel and the Wave Theory of Light," 18–22.

¹⁰³ Basdevant, "Famous Optician: Augustin Fresnel and the Wave Theory of Light," 18–22.

order to reflect light all-around with eight points of the horizon. (fig 258) M. Soutter constructed this model, and it was exhibited at the Paris Universal Exhibition in 1855. At the bottom of the figure, the mechanism enabled the rotating motion, separating the lighthouse's light from an accidental beam of light from a fire or a star.¹⁰⁴ This discovery extended the use of lighthouses and became a significant development in maritime navigation. Illumination sources were part of the lighthouse technology, together with the lenses. Stevenson states in his work "Lighthouse Construction and Illumination" three crucial attributes for lighthouse design:

The problem of lighthouse illumination is threefold and involves to some extent both physical and geometrical optics; but the fundamental principles on which most of the combinations depend, rest really on two or three simple elementary laws of catoptrics and of dioptrics. Our attention must be given,

1st, to the source of the light itself, which should produce a flame of constant intensity, and which should, as we shall afterwards see, be of the smallest possible bulk.

2d, Given the source of light, optical apparatus must be designed to collect the greatest possible number of rays coming from the flame, and to direct them to certain parts of the horizon and the sea; and

3d, when lights are multiplied on the same line of coast, it becomes further necessary to introduce distinctions in their character, so that they shall be at once recognizable from each other.¹⁰⁵

¹⁰⁴ Ganot and Atkinson, *Natural Philosophy for General Readers and Young Persons*. 327-331.

¹⁰⁵ Stevenson, *Lighthouse Construction and Illumination*, 45-46.

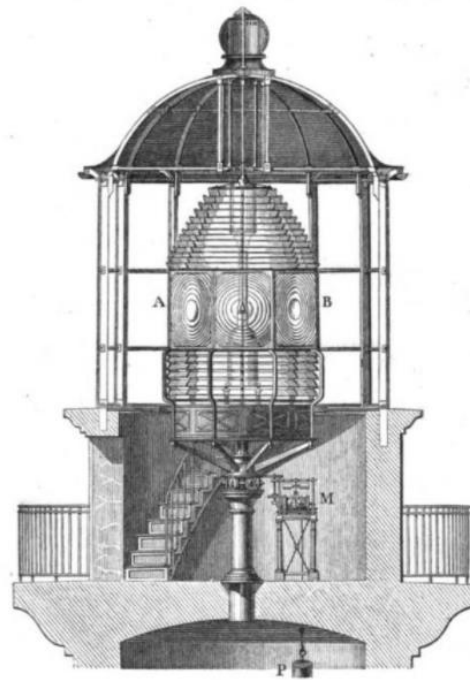


Fig. 258.

Figure 2 Fresnel lens and lighthouse light system illustration¹⁰⁶

The earliest recorded source concerning the fuel used for illumination in lighthouses is *Hakluyt's Voyages*. From this account, Stevenson notes about the use of oil, in 1595, on the shores of the Bosphorus;

“In Hakluyt's *Voyages*, vol. ii. p. 448, it is stated that "at the mouth of the Bosphorus there is a turret of stone upon the mainland, 120 steps high, having a great glass lantern in the top, four yards in diameter and three in height, with a great copper pan in the midst to hold oil, with twenty lights in it, and it serveth to give passage into this Strait in the night, to such ships as come from all parts of those seas to Constantinople.”¹⁰⁷

¹⁰⁶ Ganot, A., and E. Atkinson. *Natural Philosophy for General Readers and Young Persons*, 327.

¹⁰⁷ Stevenson, *Lighthouse Construction and Illumination*, 204-213.

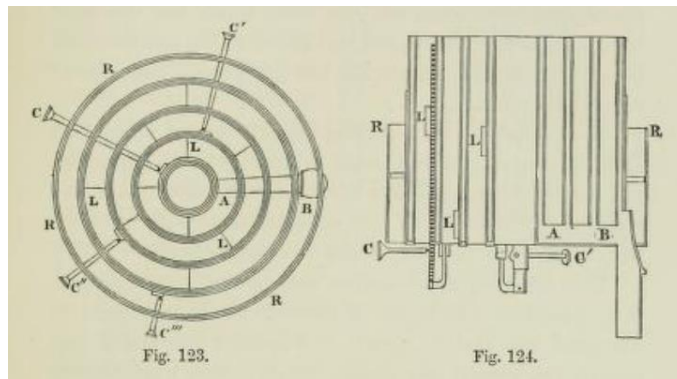


Figure 3 Plan and section of Fresnel Burners¹⁰⁸

Oil was used for a long time as a light source in lighthouses, even after the first use of coal gas for the Salvore Lighthouse of Trieste, in 1817. A burner structure is a necessity for both coal gas and oil. Stevenson lists several design alternatives of burners, including Fresnel's burner design. The drawing shows the plan and sections of the Fresnel burner, with concentric wicks, in-between spaces enabling air to pass in the inner wicks. The marked C, C', C'' and C''' are the handles for moving the wicks up and down. The part marked A-B runs oil to the wicks. Other burner types are the Argand burner, the Maris burner, and the Doty burner. The use of electric light in lighthouses was first tried at the Trinity House in London in 1857.

The French experienced electricity as a light source at Cape La Heve in 1863, and at Cape Grisnez in 1869, with the equipment produced by Messrs Sautter, Lemonnier, and Company of Paris. These developments in lighthouse technology led to an increase in lighthouse construction activity.¹⁰⁹ The table from Davenport's book on the history of lighthouses, written at the end of the nineteenth century, illustrates this issue. He states that "*We may note, in conclusion, that the coast-line of England measures 2,405 nautical miles, that of Scotland 4,467 that of Ireland 2,518, and that*

¹⁰⁸ Stevenson, *Lighthouse Construction and Illumination*, 181.

¹⁰⁹ Stevenson, *Lighthouse Construction and Illumination*, 181.

of France 2,763 nautical miles. In 1885 England had 339 lighthouses and 57 lightships; Ireland, 127 and 11; Scotland, 189 and 4, against France, 413 and 9."¹¹⁰

COMPARATIVE STATEMENT
Of the Coast-lights in the chief countries of the world (exclusive of their outlying Possessions) in the years 1860 and 1885 respectively.

COUNTRY.	LIGHTHOUSES.						LIGHT-VESSELS.		
	1860.			1885.			1860.		
	Number.			Number.			Num-ber.		
	1st Class.	Secondary.	Total.	1st Class.	Secondary.	Total.	1st Class.	Secondary.	Total.
England and Wales.....	24	178	202	43	296	339	10	118	128
Scotland.....	17	112	129	23	166	189	6	54	60
Ireland.....	11	74	85	19	108	127	8	34	42
United Kingdom.....	52	364	416	85	570	655	24	206	230
United States.....	26	314	340	51	1917	1968	25	1603	1628
France.....	32	193	225	39	374	413	7	181	188
British America.....	4	87	91	5	631	636	1	544	545
Sweden and Norway.....	3	115	118	8	321	329	5	206	211
Italy.....	3	88	91	16	234	250	13	146	159
Russia.....	2	63	65	14	164	178	12	101	113
Australia.....	6	33	39	24	231	255	18	198	216
Austria.....	..	10	10	2	61	63	2	51	53
Denmark.....	2	68	70	7	45	52	5	123	128
Spain.....	9	41	50	4	167	171	2	150	152
Netherlands.....	3	35	38	8	94	102	5	39	44
India.....	..	42	42	13	74	87	13	22	35
Germany.....	1	31	32	10	183	193	9	152	161
New Zealand.....	..	3	3	6	66	72	6	63	69
China.....	..	4	4	14	41	55	14	37	51
Turkey.....	1	13	14	..	129	..	..	115	1
Japan.....	..	..	..	8	49	57	8	49	57
Brazil.....	..	16	16	9	47	56	9	31	40
Portugal.....	1	14	15	1	29	30	..	15	15
Belgium.....	1	5	6	1	21	22	..	16	16
Greece.....	..	..	..	3	54	57	3	54	57
Totals.....	146	1559	1705	335	3383	3718	136	242	378

* Decrease, owing to the large substitution of permanent lighthouses for lightships.
† Decrease, owing to the cession of Schleswig-Holstein to Prussia in 1864.

Figure 4 Comparative Statement of the Coast-lights according to the countries in the years 1860 and 1885 respectively¹¹¹

The number of lighthouses on Ottoman coasts was also increasing in the second half of the nineteenth century. The Atlas of Coulier, in 1844, reports 24 lighthouses (5 on the Black Sea, 7 for the Straits, seven on the Aegean Sea, and five on the Mediterranean). In 1879 the number was 110, 14 more than the Ottoman government had negotiated for in the first concession dated 1860. These constructions were part of the Paris Agreement of 1857 after the Crimean War.¹¹²

¹¹⁰ Davenport, *The Story of Our Lighthouses and Lightships: Descriptive and Historical*, 37.

¹¹¹ Davenport, *The Story of Our Lighthouses and Lightships: Descriptive and Historical*. 36.

¹¹² Collas, *1864'te Türkiye*. 376.

2.6 The Crimean War and the Paris Agreement

The Crimean War and its aftermath are thought to be the turning point for Ottoman Maritime, especially naval development. The Crimean War is also considered one of the most transformative events in the 1850's Ottoman Empire. Russia declared war with the occupation of Moldavia and Wallachia on June 11, 1853, due to the issue of the Christian Orthodox holy lands being in the Ottoman Empire territory. On January 4, 1854, British and French fleets entered the Black Sea coasts to support the Ottoman Empire against the Russian Empire. These fleets were equipped with the steamships of Peninsular and Oriental (P&O) Company and Messageries Maritimes Company. At the beginning of the war, November 17, 1853, the first steamship battle in history occurred:

At that time the Ottoman-Egyptian steamer Pervaz-ı Bahri was sent to Ereğli for coal. On its way it fell in with the Vladimir on November 17 1853. In the battle that followed, the Vladimir captured the Pervaz-ı Bahri, which lost 22 dead including the Egyptian captain Said Pasha and 18 wounded men and officers. The Russians lost two dead and two wounded, however, one of the dead was Lieutenant Zheleznov, Kornilov" s aide-de-camp.³⁵⁰ The Russians returned to Sevastopol with their booty, which was renamed Kornilov. This small battle can be considered as the first battle in history between steamships.¹¹³

The war lasted until 1856 and had a massive influence on steamship technology and maritime infrastructures due to the increasing need for steamships. For example, some of the many early purchases of steamships from Britain were due to warfare necessities. Nurcan Bal, in her study on steamship use in the Ottoman Navy, recites an *irade-i sense* (imperial edict) about the purchase of steamships serving for war on account of the increased necessity. In another petition document from the London Embassy, it was stated that the contract for a 30-gun steam frigate was for £ 80000 and would be ready in March 1854; that there was no news of a frigate that could be

¹¹³ Badem, *The Ottoman Crimean War (1853-1856)*, 118-119

purchased other than this frigate, and that a year was needed to build a new frigate.¹¹⁴ For another instance, the French secretary of the Navy, Theodore Ducos stated they were not prepared for the war. The steamship fleet was not sufficient. As a result, the Messageries Maritimes Company and the ministry of war signed an agreement regarding the transportation of troops, ammunition, and the wounded from the fronts. In return, the company received many concessions involving the extension of its activity network to the Black Sea and Danube River. The French participation in the Crimean War on the side of the Ottoman state provided many advantages other than widening the lines of the Messageries Maritimes Company. One of the benefits was receiving a concession for the lighthouses to be installed on Ottoman shores by Marius Michel, who used to be the captain of a steamer that belonged to Messageries Maritimes Company. As I have stated in the first chapter, during his mission at Postal Service, he took the same repeated routes for many years, whereby he acquired an excellent knowledge of routes and the security flaws in them. Towards the end of the Crimean War, Marius Michel met Olivier Lannes de Montebello (aide-de-camp of Napoleon III) and present his study regarding the need for the lighthouse due to security vulnerability.¹¹⁵ Before elaborating on this issue, I will address the aftermath of the war and its impact on the growing importance given to the lighthouses. In the Paris Agreement, which was signed on March 30, 1856, the end of the Crimean War, the negotiations also emphasized the issue of coastal security and navigation. For example, article 17 of the Paris Agreement, concerning the state commission on the Danube coast, was established to provide navigation in the Danube Straits and adjacent sea areas. Moreover, on June 10, 1857, other negotiations

¹¹⁴ Bal, *XIX. YüzyılBuharlıGemilerDönemi: OsmanlıBahriyesi*, 52.

¹¹⁵ Uygun, *Osmanlı Sularında Rekabet*, 56-62. Here also Uygun mentions that Messageries Maritimes Company received an additional 5% discount on the lighthouse fees located along the shores of Ottoman Empire.

to the Paris Agreement were issued. One of the five articles discussed in this document refers to this article for a lighthouse in Zmiinyi Island (located in the Black Sea, near the Danube Delta)¹¹⁶

The person behind these constructions is Jean Marius Michel, the Ottoman Empire's General Administrator of Lighthouses and one of the founders of Michel and Collas Company.¹¹⁷ This company had a contract with the Ottoman government to construct and manage the lighthouses on the Ottoman shore. In a very brief summary, the agreement proposes to cover the costs of construction to gain 78% of the earnings (from the tax payment of any ship traveled on the route of the listed in tariffs) later on. The taxes are collected according to the tonnage of the ship. Marius Michel came from a family line of naval officials; his father was a lieutenant in the Navy, and his grandfather was a navy official. Michel first worked in his father's company, then joined the navy force to become a long course captain in 1843 for a postal ship. His ship was to travel to the near east for the Messageries Maritimes Company, a section of the increased transportation activity. The Crimean War was the turning point of his life; in 1854, he traveled with general Olivier Lannes de Montebello, who was responsible for reporting on the Crimean War to Napoléon III. The ship survived very hazardous conditions, and coastal security, especially in the Black Sea, attracted Marius Michel's attention. He saw this as an opportunity and wished to manage the process.¹¹⁸

¹¹⁶Collas, *1864'te Türkiye*. 376.

¹¹⁷Hastaoglu-Martinidis, "The Cartography of Harbour construction in the Eastern Mediterranean cities: Technical and Urban Modernization in the Late Nineteenth Century," 78-99.

¹¹⁸Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

CHAPTER 3

MARIUS MICHEL'S WORKS IN OTTOMAN EMPIRE DURING 1855-1860

3.1 Introduction

In this chapter, I will narrate Marius Michel's life and career in three sections. The first section is about Marius Michel's life before he became the general director of Ottoman lighthouses in 1855. The second part is about how he acquired this position and his duty as general director of Ottoman lighthouses until the establishment of Collas & Michel Company in 1860. Collas & Michel Company held the concession rights of the building and the operation of Ottoman lighthouses. The last part is concerned with the foundation and the structure of the French Collas & Michel Company after the arrival of Bernard Collas, the investor and one of the company's partners.

In the previous chapter, I covered the impact of the Crimean War on steamship technology and discussed how it provided Marius Michel an opportunity to present his idea of illuminating the coasts of the Ottoman Empire. The first section covers the time before the Crimean War and focuses on the Marius Michel's career in the Messageries Maritimes company. Later, I will go through the Crimean War events that led to Marius Michel's appointment as general director of Ottoman lighthouses. These events include but are not limited to Michel's presentation of his ideas and studies of lighthouses to Olivier Lannes de Montebello, aide-de-camp of Napoleon III. In the second section, I describe Marius Michel's first year in his new position as general director, where I include a portion of the purchases of the lighting equipment for the lighthouses he made in 1855 and ingredients of the purchased material. In addition, I will explain the 1856 tariff of lighthouse fees. The tariff states the lighthouse fees to be collected from the ship in the port, and the fee changes according to the port the

ship arrives at. The collection of lighthouse fees was significant because it was the primary and only revenue source for the Ottoman Lighthouse Administration. Furthermore, I will discuss issues surrounding the announcement and application of the mentioned 1856 tariff. In the final section, I will describe the Imperial Order he received and Marius Michel's works until the arrival of Bernard Collas, and the concession agreement regarding the privilege of construction and management of the lighthouses in the Ottoman Empire signed in 1860.

3.2 Marius Michel and His work at Messageries Maritimes until 1855

In the previous chapter, I discussed steamship technology's increase in use and the growing significance of lighthouses as a critical infrastructural element for the steamer mode of sea transportation, providing navigation services and ensuring the safety of sea travel. I ended the chapter with Marius Michel and his encounter during the Crimean War (1854) with a French general, Count Olivier Lannes de Montebello, a personal friend, and aide-de-camp of Napoleon III. At this point, I would first like to go back to the years Marius Michel spent in the postal service of the navy, which later became the Messageries Maritimes. Then I will continue with the beginning of 1854, a crucial turning point in Marius Michel's life when he met with General Olivier Lannes de Montebello in Constantinople.

On April 22, 1843, Marius Michel sought to be freed from active duty to join the State merchant marine. He was tasked to serve in the Near East liners of the merchant marine, which later became Compagnie des Messageries Nationales (Messageries Maritimes). For more than ten years, starting from 1843, Marius Michel sailed on the lines of the Near East on the Post Office liners of the Messageries Maritimes. During his service, because of the absence of modern lighthouses in this

region, Marius Michel undertook a systematic study of possible lighthouse locations along Eastern Mediterranean coasts. He launched himself with passion into a systematic survey of the shores of the Ottoman Empire and drew up a marking plan of considerable precision during these ten years. The large number of readings he took to find the most favorable position for each lighthouse allowed him to acquire an almost perfect knowledge of the different routes followed by the regular couriers.¹¹⁹ This knowledge of the routes enabled Marius Michel to present his studies to Olivier Lannes de Montebello and impress him with his practical knowledge and expertise.

At the beginning of 1854, when the Crimean War was raging on, Marius Michel was promoted due to his success in handling crises in different seas. Navigation already became a significant problem at this point.¹²⁰ During the Crimean War, General Count de Montebello, Napoleon III's aide-de-camp, unexpectedly arrived on the boat of Marius Michel because the ship he was meant to return to France on had just been lost in the Black Sea. He returned from him to France's journey to inform Napoleon III about the Crimean War.

They met on December 21, 1854, while Marius Michel's ship was about to leave Constantinople for Marseilles; Count Olivier Lannes de Montebello was returning from an investigation of the situation in Crimea. To satisfy the general's request to arrive in France as soon as possible, Marius Michel determined to take a route that would take less time to arrive at their destination and was more dangerous. This trip was an opportunity for Marius Michel to present the crucial problem of worrying inadequacy of the illumination of these coasts and his studies upon it. Marius Michel did more than explaining the situation and the opportunities that ensued; he submitted to Count de Montebello the research he had made. As soon as he returned

¹¹⁹ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

¹²⁰ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

to Paris, on January 7, 1855, the Count talked to Napoleon III about this issue. The situation was beyond immediate military problems if France did not take the project; another country such as England could have taken the initiative to build and operate lighthouses on the Ottoman coasts. Moreover, the Crimean War was still raging on, and the ever-growing list of ships supplying the French troops in the Crimea was becoming victims of accidents at sea due to the lack of lighthouses.¹²¹ Napoleon III invested twelve million francs in this project.

3.3 Marius Michel, the General Director of Ottoman Lighthouses

Considering the debilitating effects of the ongoing war, initiating lighthouse construction went relatively swiftly and smoothly. On July 19, 1855, the *Pericles* (from the fleet of Messageries Maritimes), moored in Constantinople. Marius Michel received an order through the French ambassador, Antoine Thouvenel, to leave his ship immediately and wait for instructions. On August 1, 1855, the French ambassador and Sultan Abdülmecid signed an agreement that appointed Marius Michel as director of the Lighthouses of the Ottoman Empire. The first objective of this directorate was to develop the network of lighthouses on the Ottoman coasts. This network included creating thirty-six in the Dardanelles and the Black Sea immediately and four at the entrance to the Danube.¹²² On September 18, 1855, less than two months later, he became the director of the Lighthouses of the Ottoman Empire; he arranged the first contract to maintain the lighthouses.¹²³

¹²¹ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel*, 1860-1960, 10-12.

¹²² Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel*, 1860-1960, 8-21.

¹²³ COA, HR.SFR.1.4
Etre les Soussignés

This contract was signed between M. Michel as the General Director of the Lighthouses of the Ottoman Empire and Michel Henry-Lepaute, as the engineer to the constructor of lighthouses responsible for maintaining and repairing lighthouses. Here, I think it will be helpful to demonstrate a summary of the life and works of Lepaute before moving on to the details of the contract.

Lepaute, or in his full name Augustin Michel Henry-Lepaute, was a French clockmaker to Louis-Philippe of France and Emperor Napoleon III. The first bearer of the name "Henry-Lepaute," he was born Augustin Michel Adam Henry in 1800, in Paris. He was the son of Pierre Henry, watchmaker, and Gabrielle Prevost. His father, Pierre Henry, was descended from the Lepaute family by his mother and became the King's watchmaker in Paris by associating with his uncles Jean André Lepaute and Jean Baptiste Lepaute (brothers of Elisabeth Lepaute).¹²⁴

Monsieur Michel, Directeur général des Phares de l'Empire Ottomane présentement à Paris rue des Madeleine 49, agisse en vertu du contrat qu'il a passé avec le gouvernement Impérial Ottomane le 18 septembre 1855.

Et H. Lepaute mécanicien maître des Phares actuellement au service de H. Lepaute ingénieur et constructeur de phares rue de 44 à Paris.

Articles du contrat

M. Michel choisira aussi en Europe deux mécaniciens pour la réparation et l'entretien des phares les contrats qui fixeront leur salaire, leur frais de voyage la période de leur engagement seront faits avec le consentement et par l'entremise des services de la Sublime Porte dans le pays où ils seront choisis

La période de leur service ne passera pas la durée de leur engagement et ils s'engageront à apprendre leur état et à former des élèves eures qui leur seront adjoints, et cette clause sera insérée dans leurs contrats. Il a été convenu ce qui suit.

1. H. Lepaute s'engage pour le compte de la Turquie en qualité de mécanicien monteur de phares pour leur réparation et leur entretien

2. Il s'engage aussi à apprendre son état de mécanicien monteur de Phares et à former des élèves eures qui lui seront adjoints dès son arrivée à son poste et pendant tout son séjour à Constantinople

3. L'engagement sera de cinq ans à raison de cinq mille francs par an payable par douzième

4. Il s'engage également à continuer les services pour une seconde période de ans des mêmes conditions que des seules si le gouvernement ottoman le lui demande

5. Le solde de H. Lepaute comptera à jour son départ de Paris les frais de route de Paris à Constantinople pour l'aller et de Constantinople à Paris pour le retour, seront à la charge du gouvernement ottoman.

6. À la fin de la première période de cinq ans ; il sera accordé à H. Lepaute un congé de deux mois avec demi-solde dans le cas où il en ferait la demande. mais alors monsieur Doudon contactera le même engagement ne pourrait durer plus de celui qui lui serait accordé qu'après le retour de H. Lepaute

¹²⁴ "Les Phares Des Horlogers Lepaute".

In 1823 he started to work with Augustin Fresnel to build lighthouses. Lepaute met with Augustin Fresnel while working on France's lighthouses and beacons in the Lighthouse Commission. Upon this meeting, Lepaute's company, which made clocks for monuments/clock towers, previously expanded into production mechanisms to rotate lighthouse lenses. In 1837 he founded a company of manufacturing lighthouse lenses.¹²⁵

3.3.1 The Agreement Signed between the General Director of the Ottoman Lighthouse Administration, Michel, and Engineer Lepaute

In 1855 Marius Michel and Henry-Lepaute signed the Contract for Henry-Lepaute to be the head engineer/mechanic for the Ottoman lighthouses. The agreement lasted five years and offered to pay five million francs to Lepaute in this duration with annual payments.¹²⁶ Although the number to be paid seems to be quite a lot, especially considering the budget Napoleon III provided for the Michel was twelve million francs, Henry-Lepaute's tasks included but were not limited to the repair and maintenance of the lighthouses. Henry-Lepaute had two additional missions. These tasks were the education of the engineers and possibly the installment of the lighthouses. In the second article of the contract clauses, Henry-Lepaute becomes a

¹²⁵ In Stevenson, *Lighthouse Construction, and Illumination*, 77-78. the works of Lepaute regarding the lighthouse construction is narrated: M. Lepaute's form of Revolving Light. — M. Lepaute, the collaborator of A. Fresnel, gave a design in 1851, in which, in order to avoid the use of double agents, he increased the height of the lens, and reduced proportionally the angle subtended by the mixed light prisms above and below. In this way he extended the powerful part of the light probably farther than was consistent with favorable angles of incidence of rays falling near the top and bottom of such elongated lenses. The apparatus could therefore parallelize the rays in the vertical plane only by its upper and lower prisms. Of course, if he had been acquainted with the holophotal prisms subsequently to be described, he could have parallelized the light in every plane from top to bottom of the apparatus. In M. Lepaute's letter to the U.S. Lighthouse Board, of 28th July 1851, he states that his design "received the approbation of the Commissioners of Lights in France;" and he adds that "The French Administration is about to order from the undersigned an apparatus of the first order of this description of flashes for every minute, to renew the apparatus of the light of Ailly, near Dieppe

¹²⁶"Augustin Michel Henry-Lepaute".

lighthouse mechanic and trains high-level engineers who will be added to his team as soon as he arrives at his post and throughout his stay in Constantinople. This article entails Henry-Lepaute's training mission. The other task, the installment of lighthouse equipment purchased, was not a direct contract article. Together with Henry-Lepaute, Marius Michel purchased gear from Louis Sautter to supply some lighthouses for the Ottoman Empire. The selection of companies was due to French supremacy of the lighthouse optics, and the companies of engineers such as Fresnel, Sautter, Allard, Cordemoy, and Friedmann dominated the field.¹²⁷ After the meeting of a "special commission," the first purchase was chaired by the Minister of the Navy, Admiral Hamelin, on September 14, 1855. The Commission decided to send fifteen lights immediately, to be used to light the Bosphorus, the Sea of Marmara, and the Dardanelles. This equipment was manufactured by the Henry-Lepaute Company and was available, partly at the manufacturer's company, partly in the Lighthouses and Beacons workshop. The cost of the equipment is estimated at 150,000 francs, not counting the initial set-up costs.¹²⁸ From these details of the contract, I conclude that the installment of the lights to the lighthouses was among Henry-Lepaute's duties.

3.3.2 The Necessary Equipment and Its Purchase

The purchase contains supplies such as pipes, lanterns, and candlewicks apart from the lenses. As I have mentioned in the first chapter, a burner structure that operated on coal gas or oil was necessary for the operation of nineteenth-century lighthouses. All of these materials are listed in the various purchase documents. For example, a five-

¹²⁷ Bernhard, "Le Fond Michel PACHA (102 APOM) au Centre des Archives d'Outre-mer des archives nationales," 5-14.

¹²⁸ Bernhard and Thobie, 61-85.

page document¹²⁹ about purchasing the materials required for lighthouses from Paris includes a list of the following materials:

120 pieces of pipe from the first number
300 pieces of pipe from the second number
400 pieces of pipe from the third number
100 pieces of pipe from the fourth number
Again, from the fourth number, red pipe, 100 pieces
Green tube for small lanterns 150 pcs
50 pieces of white pipe for the English lantern (their lower pole 44 millimeters and the upper square 33 millimeters and lengths 30 centimeters)
Again, for the English lighthouse pipe (even their lower pole is 43 millimeters, the upper pole is 35 millimeters, and the lengths are 30 centimeters)
50 pieces of candlewick meter-long from the first number
50 pieces of candlewick meter-long from the second numbers
60 pieces of candlewick meter-long from the third number
60 pieces of candlewick meter-long from the fourth number
100 pieces of candlewick meter-long for small lanterns
50 pieces of candlewick meter-long for British lantern found with a lock
Again, for the English lantern, the roving subway at the twenty-seven-millimeter pole 25 pieces
Two dozen of cutters for the necessity of the lighthouses.¹³⁰

The document includes this list of purchases and contains correspondence notes concerning several purchases for the lighthouses. One of the notes regarded the help for the delivery of the needed materials for the lighthouses.¹³¹ Another one considers the account book issued by Monsieur Michel regarding the material required to be purchased and brought by the Paris embassy for the lighthouses. The naval council decision attached to this report to the embassy to acquire materials as listed in the conclusion of the navy council.¹³² This list above is a part of the correspondence note regarding the urgency of the purchase. The last document also included the original French letter written by Marius Michel. This document is additionally concerned with the illumination of Sulina Strait and Zmiinyi Island located in the Black Sea, near the Danube Delta. Apart from this document, these lighthouses in the treaty concluded in

¹²⁹ COA, HR.MKT.207.26.1-7

¹³⁰ COA,MKT.207.26.5

¹³¹ COA,HR.MKT.207.26.1

¹³² COA,HR.MKT.207.26.3

Paris on June 10, 1857, after the Crimean War. I will expand this document in the next portion since, together with this one, there are two additional documents about the lighting of Sulina Strait and Zmiinyi Island.

3.3.3 Lighting of Sulina Strait and Zmiinyi Island

The Danube River flows from west to east through much of Europe, with Sulina Strait serving as one of its departure points to the Black Sea, and the Zmiinyi Island is located in the Black Sea, near the Danube Delta. The illumination of the Sulina Strait and Zmiinyi Island was an issue repeated in several documents, one of which is the treaty concluded in Paris on June 10, 1857, establishing the boundary between Russia and the Ottoman state in Bessarabia, the Danube delta, and the Zmiinyi Island, and ratified on December 31, 1857. This treaty was an additional negation to the Paris Agreement signed on March 10, 1856. In the fourth article of the 1857 treaty, it is stated: "In line with the interests of international maritime trade, the Devlet-i Aliye (state) undertakes to build a lighthouse on the Zmiinyi Island, aimed at navigating the ships sailing on the Danube and going to the port of Odessa; The Danube Coast States Commission, which was established by Article 17 of the Treaty of March 30, 1856, to ensure navigation in the Danube Straits and adjacent sea sections, will pay attention to the regular service of these lighthouses."¹³³

The document about the purchased lighthouses for Sulina Strait, Zmiinyi Island is issued eight months after the first Paris Agreement on November 4, 1856. The document explains the payments together with the lighthouses purchased for the shores of the Marmara Sea as follows:

About the issue of cost and expenses of the lighthouses purchased for Sulina Strait, Zmiinyi Island (located in the Black Sea, near the Danube Delta)

¹³³ Collas, *1864'te Türkiye*. 376.

together with Marmara Sea stations with the efforts of Monsieur Michel and the incomes & payments formed ninety-nine thousand nine hundred ninety francs to be arranged and provided from treasure this issue is informed by the Capitan pasha and as a result of the information he gave and asking for permission the sultans' order is decreed on the fulfillment of the required payment and aid about this problem. The mentioned Capitan pasha is informed about the decree.¹³⁴

The following document, which was the one with the original French note written by Marius Michel issued almost a year later, November 29, 1856, is concerned with the provision of material for the lighting of the lighthouses the oil, candlewick, and flame; otherwise, lighting could die down:

According to the news received by Sulina, crystal bottle and candlewick were requested for both the mentioned place and the lighthouse of Zmiinyi Island, and it was not expected that it would end in such a short time since the candlewick and bottle [of burner oil] were given to these places. There is no doubt that the two lanterns will go out in winter when there is a special permit to send a mechanic and oil and flame to Sulina and Zmiinyi Island.¹³⁵

3.4 1856 Tariffs

Upon building modern lighthouses and modernizing the existing lighthouses by installing modern lights to them, in total, there were twenty modern and modernized lighthouses on the Ottoman shores; nine on shores of Dardanelles, two in the Marmara Sea, five in Bosphorus, and four in the Black Sea, in the first year of Marius Michel working as the General Director of Ottoman Lighthouses. At the end of the first year, in September 1856, the lighthouse tariff was published stating the lighthouse fees according to the ship's tonnage.¹³⁶ The tariffs list the lighthouse or light fee to be collected on the port of arrival. Since the lighthouses were illuminating the routes of the steamers, they are listed as the "lines" (خطوط, *hutut / hatlar* in Ottoman Turkish) in the tariff. The tariff payment for lighthouse service was taken from commercial liners

¹³⁴ COA, A.}MKT.NZD.199.76

¹³⁵ COA,HR.MKT.207.26.7

¹³⁶ SALT Research Archives, City, Society, and Economy Collections, Other Holdings- ABK003

according to their tonnage. According to the arrival location for any ship with a carriage up to eight hundred tons, an exact price was set according to the arrival location for any ship with a carriage up to eight hundred tons. If the boat carried more than eight hundred tons, an additional amount had to be paid for each ton. In the tariff, the most expensive payment was in Izmir/ Smyrna line with 15 paras up to eight hundred, 7 ½ paras for each an additional ton exceeding eight hundred. The lowest amount was 8 and 4 paras for surpassing tons in Albane in the Adriatic Sea. The other lighthouse lines had a fixed tariff of 10 and 5 paras: Mitilini/Lesbos, Chios, Thessaloniki/Selanik, Volos, Samos, Kos, Rhodes, Caramine, Syria, Candie, Tripoli de Barbarie, as well as the Anatolian and Rumelia Sides of Black Sea (which I assume to be the Dardanelles and the Black Sea). In 1856, this tariff for the lighthouses was published; its introduction, announced for April 15, 1857, was ineffective until November 13. After the announcement, it faced a considerable backlash with a group of protests from the steamship companies.

The Imperial Messengers lodged the first and most strident protest, claiming that the tariff was based on a far too high base and requesting that the matter be reviewed. When waiting for their turn, the Austrian Lloyd was hesitant, and the English "reserved the right to complain if the tariff was too high." In December 1857, the ambassador Thouvenel expressed his concern: "It seems desirable that such a valuable work, undertaken under the direction of a French engineer, and which has been functioning for several months with a regularity attested by the captains of liners, should not be compromised by prolonged resistance. A joint commission is set up to review the technical and financial issues; it includes H.E. Said Efendi, adviser of the Admiralty, Mustafa Pasha, president of the council of the Imperial Navy, Mesud Pasha, general captain of the direction of the Port, Kabuli Efendi, interpreter of the

Imperial Divan, Vartan Pasha, interpreter of the Imperial Messageries, Marius Michel, general director of the Lighthouses, and A. Garbeyron, frigate captain, with the title of inspector delegated by the French Minister of the Navy. This Commission, which met for the first time on February 20, 1858, submitted a detailed report on the tariff system in April: The Ottoman barrel of 792 tons was used as the basis for the calculations; the tariff remained unchanged, but a 40 percent deduction was given for liners, and privileged treatment could be granted depending on circumstances.¹³⁷

Nonetheless, direct payments remained few and far between. On this matter, the companies had a strong argument; at the end of 1859, there were still only twenty lighthouses built or modernized out of thirty-six in the contract. The Ottoman government bears a substantial portion of the blame for this. The Ottoman authorities seemed to lose interest in an organization initially costly and likely to cause severe complications with international trade, especially with Great Britain after the Crimean War ended. An order of payment dated five months after the end of the Crimean War states that Monsieur Michel and his cortege had not received any compensation for one and a half months even though their contract orders payment of twelve thousand francs.¹³⁸ Furthermore, the credits of the Lighthouse Director were reduced, leading to a stagnation of the work undertaken by Marius Michel. Without a doubt, the fees that lighthouse users paid would have been enough to ensure the business's financial success, but in the meantime, since it was necessary to undertake costly construction works, Marius Michel had to enlarge his monetary base.

¹³⁷ Bernhard and Thobie. "Le rôle de Michel Pacha dans L'administration Générale des Phares de L'Empire Ottoman"61-85.

¹³⁸ COA, HR.MKT.154.72

3.5 The Lighthouse Construction until the Collas' Arrival

The tariffs of 1856 seemed to be fair since, by the end of 1856, twenty lighthouses had been created or modernized; nine in the Dardanelles, two in the Marmara, five in the Bosphorus, four in the Black Sea. Naturally, these were the lighthouses and lights entitled to the collection of taxes because of their modernity. However, there were still only 22 of them in 1860 out of thirty-six in the contract. This relative decrease in lighthouse construction activity was related to the two major factors I have mentioned above: the diminishing interest of the Ottoman government and the necessity of more significant financial support. Applying the 1856 tariff would bring in extremely vital resources, provided, of course, that lighthouse construction was effective. This required a long-term plan, a program of orders, the training of technicians, all initiatives that the Ottoman administration was unwilling to undertake. As a result, the corporation was expected to function as a concessionary corporation, with contractual ties with Ottoman State rather than a directly state-owned company. The contract will define the obligations of the company and the conditions of the concession rights.

There is a prospect of making much money here for the concessionaries of the building and operation of lighthouses located in the Ottoman shores from the collected fees. And indeed, if Marius Michel was going to make much money, it must be said that Camille Collas contributed a good half of it without detracting from the exceptional stature of Michel Pasha. Hence Bernard Camille Collas' arrival. Meanwhile, in 1859 Marius Michel received an Order of the Mecidiye, which is given to him for his outstanding work and exceptional services.¹³⁹

¹³⁹ Bernhard and Thobie, "Le rôle de Michel Pacha dans L'administration Générale des Phares de L'Empire Ottoman" 61-85. Also COA, A.}DVN.MHM.29.13, The document states: "The lighthouses administrator from the French intellectual community and responsible from the construction of lighthouses in several shores in different countries of the state Michel as a person with understanding and intellect has shown excellent service and loyalty. Therefore, he is worthy of a huge gift; upon this and as a quid pro quo his needed services he is decorated with the fourth rank of Order of the Medjidie

3.6 Collas Meets Marius Michel, Leading to the 1860 Contract of Lighthouse Concession

Thobie suggests that Marius Michel and Bernard Collas were introduced by their mutual friend Ferdinand de Lesseps. Ferdinand de Lesseps was the person who had acquired the concession of Suez Canal construction in 1855. He also attempted to build the Panama Canal, which had failed in the late nineteenth century. According to many scholars, the Suez Canal was a vital infrastructure for steamships, creating a drastic increase in global maritime transportation.¹⁴⁰ In the next chapter, I will discuss this issue with implementing the lighthouses in the Red Sea, considering two infrastructures together. In his book about his recollections of forty years (1847-1887), Ferdinand de Lesseps wrote about the origin of the Suez Canal idea in a letter To M. 'S. W. Ruysenaers, Consul- General of Holland in Egypt:

I confess that my scheme is still in the clouds, and I do not conceal from myself that, as long as I am the only person who believes it to be possible, that is tantamount to saying it is impossible. What is wanting to make it acceptable to the public is a basis of some kind, and it is in order to obtain this basis that I seek your co-operation.

I am referring to the piercing of the Isthmus of Suez, which has been talked of from the earliest historical times, and, which, for that very reason, is regarded as impossible of execution. For we read, in fact, in the geographical dictionaries that the project would have been carried out long since if the obstacles to it had not been insurmountable.

I send you a memorandum which embodies my ancient and more recent studies, and I have had it translated into Arabic by my friend Duchenoud, who is the best of the Government interpreters. This document is a very confidential one. You will form your own opinion as to whether the present Yiceroy, Abbas Pasha, is the man to comprehend the benefit which this scheme would confer upon Egypt, and whether he would be disposed to aid in carrying it out.¹⁴¹

I find the idea of Ferdinand de Lesseps introducing Michel and Collas very fascinating since both had acquired concessions for maritime infrastructure along the Ottoman

¹⁴⁰ Searight, *Steaming East.*, Warf, *Time-Space Compression.*, Barak, *Powering Empire.* Gelvin and Green, *Global Muslims in the Age of Steam and Print.*

¹⁴¹ De Lesseps, *Recollections of Forty Years*, 153-153.

shores. Collas immediately declared his interest in the future of the Ottoman Lighthouses.

3.6.1 Bernard Camille Collas

Bernard Camille Collas, born in Bordeaux in 1819, already had a prosperous career behind him. At the age of forty, he was a captain at sea for years. He was narrowly elected at the French National Legislative Assembly of May 1849 as an independent deputy. During this mission, he was particularly active in all the problems concerning maritime interests. Later, he became director of an important shipping company in Le Havre, a specialist in naval affairs, well informed on major Mediterranean ports. Additional to his maritime interest, he also had a personal interest in the Ottoman Empire. He wrote a book about Turkey, "La Turquie en 1861," which he developed three years later in an updated version. In the introduction of the new edition, he celebrates the accession to Sultan Abdulaziz's throne and his reforms that transformed the country.¹⁴²

3.6.2 Discussions of the 1860 Contract of Lighthouse Concession

The date of Collas and Michel's first meeting remains unknown, but I assume it was around a year after the publication of the first lighthouse tariff in 1856. In a document regarding the translation of books and bills regarding the prices of five lanterns and other belongings, Michel, the Director of Lights, Monsieur Collas, is listed as one of the people receiving payment.¹⁴³ This document was dated November 11, 1857, so during the end of 1857, Michel and Collas were already working together.

¹⁴² Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 15-19.

¹⁴³ COA, HR.MKT.217.6

In December 1859, Marius Michel and Bernard Collas submitted a first draft of the concession agreement for the Ottoman lighthouses to the French government.¹⁴⁴ This contract aimed to undertake the completion of the lighting system of the Ottoman Empire coasts in the Mediterranean, the Dardanelles, and the Black Sea; according to Thobie, a total of 96 lighthouses (74 added to the 22 completed in 1860) as stated in annex (A) of the contract.¹⁴⁵

The contract was signed in 1860 since, according to Thobie's study, the negotiations for the agreement didn't go smoothly, mainly because of Sir Henry Bulwer, the ambassador of Great Britain. Sir Henry Bulwer initially opposed the project; later, he declared that he would not condemn the initiative. Conversely, Sir Henry Bulwer was intrigued with the Kapudan Pasha to abolish the concession contract. Another important note is the dates which were quite confusing; the first signed text is dated July 15, 1860, while the contract document in the Ottoman archive, which also Thobie based on dates to 8-20 August 1860, and there is a final signature date which on September 3, 1860, presumably the date the official signatures were done for contract come to the force. The document of the concession contract in the Ottoman archives is dated 8-20 August 1860; therefore, I will take that date exactly.

On May 12, 1860, Camille Collas arrived at Constantinople, and the next day, together with Marius Michel, he met Ali Pasha, the president of the Tanzimat council, Mehmet Rüşdü Pasha, the grand-vizier, and Fuad Pasha, the Minister of foreign affairs: all of them gave hope and let it be known that the business was on the right track.¹⁴⁶ Meanwhile, Sir Henry Bulwer's opposition was continuing implicitly.

¹⁴⁴ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 15-18

¹⁴⁵ COA, HR.HMŞ.İŞO 71.2, the annex mentioned wasn't in the Ottoman archives

¹⁴⁶ Bernhard and Thobie. "Le rôle de Michel Pacha dans L'administration Générale des Phares de L'Empire Ottoman," 61-85.

Collas kept the ambassador de Lavalette and Ali Pasha informed of the progress of the negotiations, and on July 15, 1860, the French text of the contract was signed. Collas addresses his Emperor to inform him of the situation:

Your Majesty, who deigned to recommend me to Monsieur the Ambassador of France, will allow me to say to him that he was for me, in all circumstances, of the benevolence of which I cannot too much point out the delicacy and the energy... ..there is a question of humanity and general interest... ..to push the work with the greatest celerity... ..the cast-iron towers, the lighting equipment, and finally the entire equipment, will be built in France. The work will occupy a considerable number of workers for a year... ..We have to fight against England, but this fight does not frighten me; France is big enough not to fear anyone in any respect. We can do as well as the English manufacturers, but we are not sufficiently known on the foreign markets, and this is the primary cause of our inferiority in Turkey. We have to get the Turks used to dealing with us and divert the current that has gone to the English market. It is easy.¹⁴⁷

On September 3, 1860, the exchange of signatures took place, and the next day the Lighthouse Service was handed over to the concessionaires.

3.7 Lighthouse Concession Contract of August 8/20, 1860

The Lighthouse Concession Contract of August 8/20, 1860,¹⁴⁸ consists of nineteen articles. The main object was for the Ottoman government to fulfill the construction of a lighting system on the shores of the empire, obtaining the concession and getting a percentage (78% according to the art. 13) of the revenue from the collection of

¹⁴⁷ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 20. Thobie quotes from document he listed as IV-I. Collas to Napoleon III, 18.7.1860; a copy of the dispatch is addressed to the Count of Montebello "Votre Majesté, qui a daigné me recommander à Monsieur l'Ambassadeur de France, me permettra de lui dire qu'il a été pour moi, en toutes circonstances, d'une bienveillance dont je ne saurais trop signaler la délicatesse et l'énergie il y a une question d'humanité et d'intérêt général... ..à pousser les travaux avec la plus grande célérité... ..les tours en fonte, les appareils d'éclairage, enfin le matériel entier, seront construits en France. Les travaux occuperont pendant un an un nombre considérable d'ouvriers... ..Nous avons à lutter contre l'Angleterre mais cette lutte ne m'effraie pas; la France est assez grande pour ne redouter personne sous aucun rapport. Nous pouvons faire aussi bien que les fabricants anglais, mais nous ne sommes pas assez connus sur les marchés étrangers, et c'est là la cause première de notre infériorité en Turquie. Il faut habituer les Turcs à s'adresser à nous et s'efforcer de détourner le courant qui, jusqu'à présent, s'est porté sur le marché anglais. C'est facile"- translated by author

¹⁴⁸ COA, HR.HMŞ.İŞO 71.2 also could be seen at appendix B

lighthouse dues on all the lines already established or to be established. These lighthouse fees were to be collected according to the tariff adopted on September 1, 1856. Additionally, five major ferry companies founded under the Ottoman Naval Arsenal, the Imperial Messengers, the Austrian Lloyd, and the Russian Navigation and Trading Company continued to enjoy the 5% discount granted to them on all lines in principle. (art. 14). To receive this, they were expected to complete the lighthouse network first. Collas and Michel, each in their capacity, undertook the effort to complete the lighting system of the coasts of the Ottoman Empire; the Mediterranean, the Dardanelles, and the Black Sea, by increasing the number of lighthouses from 22 to 96 within three years. The twenty-year concession would begin to run only under these conditions (art.1, art.3, and art.7). Collas and Michel would build at their own expense "the towers and masts, fireboats and lightkeepers' houses," take care of the maintenance of the new lighthouses, and pay for the supplies and salaries of the employees, and would provide all the expenses of the service. (art.5) The same article stipulated that all purchases (all equipment related to the lights and all the towers, tools, supplies, without any exception) would be exempted from the customs fees. Furthermore, the necessary land would be provided free of charge by the Ottoman Government.

After indicating the primary purpose, the first issue covered in the contract was establishing a joint commission composed of Ottoman and European representatives, chosen among competent people, and presided over by the Capitan Pasha or by a delegated officer of the Sublime Porte. (art.5). Their span of authority is explained in seven of the nineteen existing articles. The Joint Commission had the right to determine whether it would be helpful to establish new lighthouses later (art.4). The Commission would be obliged to resolve any difficulties that may arise in custom

exemption (art.6). It was also expected to inspect the Concessionaires' complete management of the lighthouses with the Ottoman Government and be obliged to determine cases of negligence in the service (art.8 and art.9). In addition to the inspection rights of the Commission, the Ottoman Government would have the privilege of inspection and would be able to have an Inspector whenever it wished.

The eleventh article concerns the conditions of recent personnel to be hired by the Direction of the Lighthouses, also asserting the changing status of Marius Michel, who had served as the General Director of Ottoman Lighthouses and emerged as the prospective Concessionaire:

Art. 11 - The employees with contracts currently belonging to the Direction of the Lighthouses will be kept until the expiration of their commitment. The concessionaires will pay the salaries of these employees until the expiration of the contracts. The personnel currently serving the established lighthouses will be left at the disposal of the concessionaires until they have been able to replace them so that the service of the lighting will not be interrupted. The treaty signed on August 1, 1855, between the Ottoman Government and Mr. Michel, by virtue of which he was appointed Director-General of Lighthouses, is canceled¹⁴⁹

Consequently, Marius Michel stepped down from his position as the General Director of Ottoman Lighthouses, and thereby the Collas and Michel Company was founded.

3.8 La Société Collas et Michel

In order to determine the nature of the relationship between Camille Collas and Marius Michel, as well as the extent of their respective rights, the two entrepreneurs decided to create a general partnership, to which they associated a mutual friend, Baudouy Joseph, Director of Traffic and Maritime Services Administration of Imperial Messenger Services, living in Constantinople. The statutes of the Collas and Michel

¹⁴⁹ COA, HR.HMŞ.İŞO 71.2 also could be seen at appendix B

Company were established in 1860, and the duration of the company was based on the course of the concession of the lighthouses. The company's purpose was to ensure the operation of all lighthouses of the Ottoman Empire: Collas and Michel were given the title of general administrators with extensive powers. A remarkable division of tasks was established between the two partners: Michel was responsible for internal affairs and management; Collas was responsible for external affairs and planning. Gabriel Collas, Camille's son, became the director of the Lighthouses with a power of attorney from the two managing directors. La Société Collas et Michel was French and had its headquarters in Paris. Its actual activity was reduced to that of an administrative office responsible essentially for distributing the income from the operation of the lighthouses among its various partners. In 1860, the rights of each partner in the profits accruing to the concessionaires were fixed as follows: 4/9 for Collas, 3/9 for Michel, 2/9 for Baudouy. On Baudouy's death, the company was dissolved, and a new one, formed by the only two concessionaires, replaced it in August 1879: the rights of Collas were fixed at 5/9 and those of Michel at 4/9. According to the statutes, the death of one of the associates could not stop the existence of the company, which would continue until the end of the partner's term, under the management of the surviving associate and the son of age of the deceased.¹⁵⁰

¹⁵⁰ Bernhard and Thobie. "Le rôle de Michel Pacha dans L'administration Générale des Phares de L'Empire Ottoman," 71.

CHAPTER 4

MARIUS MICHEL’S WORKS IN OTTOMAN EMPIRE BETWEEN 1860-1879

4.1 Introduction

The previous chapter ends with the 1860 concession contract and the establishment of Société Collas et Michel (Collas and Michel Company). In the first section of this chapter, I will discuss several issues, such as the implementation of the tariff of the lighthouse fees and the locations chosen for lighthouse construction activity. Apart from its increasing trend of lighthouse building activity, I will connect the building activity of lighthouses with technological developments in navigational safety and another significant infrastructure project, the Suez Canal, in the second section. Suez Canal is a central infrastructure project in the nineteenth century. In 1870, a year after the inauguration of the Suez Canal, 486 ships passed from the Canal with a net tonnage of 436,609 tons and with 26,758 passengers. Five years later, in 1875, the number of ships had almost tripled and become 1,494, the net tonnage carried had gone up to 2,009,984 tons, and the number of passengers was 84,446, both exceeding their quadruple.¹⁵¹ The increased maritime traffic volume after the opening of Suez Canal is impressive. In the third section, I also evaluate the building and operating activity of lighthouses with a relatively global-scale map of lighthouses in 1850 and 1870, from On Barak’s book on use of coal with relation to steamship technology and the infrastructures revolving around this endeavor to enable the access of coal in the London Bombay Coal corridor, titled *Powering Empire*. To this end, I also use the revenue tables of the Collas and Michel Company. After this, I discuss the Suez Canal. I finalize this chapter by renewing the 1860

¹⁵¹ Öngör, *Coğrafya Sözlüğü*, 808.

concession agreement in 1879 or the second concession contract. Additionally, I will touch upon Marius Michel's life events to trace the timeline of the general infrastructure development endeavor from the perspective of his life. Marius Michel's life events also contain his departure from Constantinople to Sanary-Sur-Mer to become the mayor. This fact became relevant due to his work in Sanary for the construction of modern quays in order to enable the approach of the steamships to the shore. Such connection is important for two reasons. Firstly, and more importantly for supporting my argument, Marius Michel was an entrepreneur with foreign direct investment in the Ottoman Empire during nineteenth century, who rendered the naval trade more compelling. Secondly, to highlight intertwined infrastructures of maritime transportation elements and make this intertwined relationship of components of marine transportation infrastructures legible in terms of linking the quay and lighthouse structures. For the aftermath of the 1860 contract and tracing of the building activity in the first section, I use a particular document type called *ilanname*. An *ilanname* is an announcement document for marine workers, to announce the opening of the lighthouses. As the 1860 contract states in its third article, the construction phase of the planned lighthouses was to be finished in three years maximum (before 1863). To follow this construction endeavor, I use the *ilanname* documents throughout 1861-1864. I also include a part in the first section of this chapter tariff imposing as a part of the aftermath of the 1860 contract section. The *ilannames* are critical to giving an idea about the construction patterns of the lighthouses. From them, I could trace the exact date and location of a built lighthouse. The making of the lighthouse network infrastructure system in the Ottoman Empire became a tangible concept. The tariff document matters since its structure and application reveal the process after the lighthouse is constructed. The

document states the direct proportion between the volume of the steamship and the fee paid for the lighting service. As a result, this contributes to the argument about the direct relation of the intensified volume of maritime trade and lighthouses.

Furthermore, I connect the development of regular steam travel discussed in the first chapter with navigational advancements. To do so, I talk about cartographical work at the beginning of the nineteenth century regarding the survey of the geographical formations in the Red Sea and the establishment of Greenwich Meridian as a standard towards the end of the nineteenth century. Additionally, I include another significant maritime infrastructure project in the second half of the nineteenth century, the Suez Canal, and its great influence on the intensification of maritime travel since it was the first modern form of infrastructure enabling the maritime transportation link to connect the Mediterranean with the Indian Ocean. Accordingly, I talk about the increasing lighthouse use relating to the development of regular steam travel in the area.

4.2 The Aftermath of 1860 Contract in Terms of Construction Work

The 1860 lighthouse concession contract demands the accomplishment of works on the line from the Dardanelles to the Black Sea within one year from the date of the present agreement. As article three states;

The works on the line from the Dardanelles to the Black Sea must be completed within one year from the date of the present contract. The work on the other lines must be completed within a maximum of three years.¹⁵²

This work is defined according to maritime lines; the lighthouses are not constructed as singular strategic points. On the contrary, they are defined, hence planned along the lines of steamers/liners in an indirect manner. These lines connect canals, shores,

¹⁵² COA, HR.HMŞ.İŞO 71.2 also could be seen at appendix B

and points in islands or island groups. The yield on the lines other than the line from the Dardanelles to the Black Sea was to be completed within a maximum of three years. The lighthouses and the lines are listed in an appendix to the contract. The list was not included in the archives; however, Thobie added a list of lighthouse constructions until 1884 in his book¹⁵³. This list is derived from the French documents of the Lighthouse Administration. The spelling of the list is also done accordingly. A derivation of this list can be found in table 2. In this list, he included the building activity until the 1860 contract, which consisted of twenty-two lighthouses. These are ; Kili, Kara Burnu, Sulina and Zmiinyi Island, Çanakkale, Gelibolu, Roumelian/Rumeli Fener, Anatolian/Anadolu Fener, Sarayburnu, Yeşilköy, Nara Burnu, Fener Bahçe, Adatepe, Marsa Alam, Kum Kale, Sultaniye Kalesi, Kilitbahir Kalesi, Bovali, Galata (Dardanelles), Seddülbahir, Kız Kulesi, Tophane.¹⁵⁴ In the few years following the 1860 contract, lighthouse building activity picked up great speed. The contract document did not state the number of the lighthouses to be completed; the chart given in the book of Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, lists ninety lighthouses added to the existing twenty-two, making up a total of one hundred and twelve lighthouses. Yerlikaya's research reveals a very similar number. In her research, she asserts, seventeen lighthouses were built between Lesbos Island-Sığır Cape and Black Sea-Kılı between 1860 and 1863. The total number of lighthouses constructed, together with the lighthouses built in the Black

¹⁵³ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 265.

¹⁵⁴ I have listed the lighthouses with the spelling Thobie uses from the French documents of the Michel and Colas company. The original names are with the same order: Kili, Kara Bournou, Ile des Serpents, Soulina, Cape Hellès, Gallipoli, Roumélie Fener, Anatolie / Anadolu Fener, Pointe du Sérail, San Stéfano, Nagara, Fener Bagtché, Ilôt du Fanal, Chablar, Koum Caleh, SultaniéCalessi, Killid Bahr, Bovali, Galata (Dardanelles), Tchardak, Kizkoulesi, Tophané. Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 265.

Sea, Aegean Sea, and Syria until 1864, reached one hundred and eleven, one less than the figure provided by Thobie. She concludes this from the archives of the general directorate of coastal safety (KEGM Archive).¹⁵⁵ One can assume that a late addition occurred.

Before tracing the construction activity, I discuss two examples of events in the lighthouse construction process as prescribed in the 1860 concession agreement, in order to explore the construction process in a more detailed manner. These documents will unravel several phases of the process as well as lighthouse use after the construction. These phases cover the construction of tower, and if a tower exists (for lighthouse or in the case of Rhodes as part of the fortress), any kind of opposition it faced and the implementation of the light of the lighthouse itself. The first document regards the lighthouse construction in Rhodes Island dated July 29, 1863. The essential factor in the lighthouse construction in Rhodes is the lighthouse's building at the St. Nicholas Fortress in Mandraki Harbor; as seen in figure 5. Thus, the issue here is the transformation of the old tower in the fort, with the implementation of a new light to the tower in order to turn the old tower into a lighthouse. This transformation faced opposition from the locals of the island. The residents of the island did not welcome the old tower becoming a lighthouse. Since the tower was part of the fortress, it had military ties too, therefore the artillery commander was also strongly opposed to the transformation of the tower to a lighthouse. Here, I want open a parentheses to highlight how the existing structure, especially an existing structure with a different function than the lighthouse itself, made the lighthouse implementation process more complicated.¹⁵⁶ In the same

¹⁵⁵ Olcay Yerlikaya. "İzmit Körfezi'ndeki Tarihi Deniz Fenerlerinin Mimari Analizi ve Koruma Önerileri" 151-152.

¹⁵⁶ COA, HR.MKT.463.48.1 and COA, HR.MKT.463.48.3

document later on, it is stated that due to an unknown incident, the old tower had become a ruin. Consequently, it was not possible to use the old tower as a lighthouse and the old tower was to be demolished completely to be replaced with a new lighthouse tower. Furthermore, the correspondence documents concern the construction of the new lighthouse and display the mentioned process. This process included but was not limited to the oppositions from the locals and the process of permission for both demolition and construction. The ruins of tower were used as material for the new lighthouse and this decision was part of the proposal Marius Michel made to the Council of Naval Arsenal (*Tophâne-i Âmire Meclisi*).¹⁵⁷ The last section of the document concerned the permit for the construction to be given by Council of Naval Arsenal (*Tophâne-i Âmire Meclisi*). In the document Monieur Michel and Monieur Collas ask for the permit for the construction in Rhodes since apart from the permit, everything for the new lighthouse construction was ready. These documents on the lighthouse construction in Rhodes Island clearly show the issues concerning the construction in terms of the activity itself, oppositions regarding construction and the bureaucratic side of the process.

¹⁵⁷ COA, HR.MKT.463.48.3



Figure 5 Lighthouse in Rhodes Island ¹⁵⁸

The second one regards a correspondence document on the construction of two lighthouses in Port of Beirut and a neighborhood in Beirut called *Ra'sü'l-Beirut*, and the tariff demanded at the Port of Beirut and Sidon (mentioned as *Sâyda* in the correspondence document) dates to October 31, 1863. The first section of the official correspondence documents covers Monsieur Michel's arrival to Beirut for the plans of construction of two lighthouses (a small one near the Port of Beirut, the other one more prominent and planned to be located in the neighborhood called *Ra'sü'l-Beirut*). Two months later, an officer of the lighthouse administration arrived to bring the lights for the lighthouses. The lights were installed in a day; the officer demanded the tariffs from the ferry companies, and the steamships arrived at the Port. Besides, the mentioned officer ordered taxes in the Sidon pier. He justified this with the lighthouse in *Ra'sü'l-Beirut*. His behavior faced opposition since the lighthouse is three miles away from the Port of Beirut while it was thirteen miles away from the Sidon. What is more, the range of the lighthouse in *Ra'sü'l-Beirut* was only twelve

¹⁵⁸ Istanbul University Rare Works Collection (Hamidian Visual Archives) , 90807-0010

miles. The second section of the official correspondence covers the response to this complaint; a necessary warning had been given to the officer regarding his behavior in the Port of Beirut. However, the decision on the Sidon issue was in the jurisdiction of the council of the *Tershane-i Amire* (Main Naval Arsenal).¹⁵⁹ The first incident is different because the lighthouse is implemented into an existing fort to remove the old tower. The second gives us the importance of the distances from the ports and the lighthouses' mile range, especially for implanting the tariffs. From these examples, I can infer two important pieces of information regarding both the building and operation process of lighthouses in the Ottoman Empire during the second half of the nineteenth century. The incident regarding Beirut concerns the difficulties of the application of the tariff. Moreover, it gave information about the process of lighthouse fee collection in detail. It reveals how the lighthouse fees are collected in terms of the proximity of the lighthouse and the Port the steamship approaches. The incident about the lighthouse building in Rhodes hints us that the obligation of the lighthouse construction could be decreased into the implementation of the lighting structure to an existing tower or fort within the settlement. In order to trace some of this construction activity process with relatively more specified dates, I introduce and expand a particular genre of documents called *ilannames*.

4.2.1 Ilanname

The *ilanname* documents are the announcement documents regarding the illumination date of the lighthouses. From these *ilanname* documents, I was able to pinpoint the precise date and location of a constructed lighthouse. While in Ottoman Empire, the construction of a lighthouse network infrastructure system became a

¹⁵⁹ COA, HR.MKT.467.72

priority, the patterns of the lighthouse we establishment became legible with ilanname documents by location and date. In the Ottoman Archive, they are generally grouped as the notices emanated by the Ottoman Lighthouse Administration. The papers are written in French with the title "*Avis au Navigateurs pour le phare*" ("Notice to the Mariners" for the lighthouse). In the documents, the lighthouses planned to be illuminated are stated. Even though most of these documents are printed, the earliest one I encountered, dated 1861, is handwritten. The typical *ilanname* has the announcement as follows:

Mariners are notified that both of the above lights will be lit on October 1, 1863. The longitudes which determine the positions are counted according to the meridians of the observatories of Greenwich and Paris. The wind areas are related to the true meridian of each place.¹⁶⁰

Then generally, in bold font, the line to which the lighthouse belongs is stated. In the *ilanname*, under each announced lighthouse, the attributes are listed. These qualities regard; the location, the color of the light (such as red, white, green), occasionally the frequency of the light, the height, the distance of the lighthouse from the ocean in meters, and the reaching range of the light in miles. The location is described in terms of its proximity to the known neighborhoods, the known shores' sides, and the line that the lighthouse belongs to—the place the lighthouse is located also given in its exact Latitude and Longitude. The longitude is provided in both, according to the meridian of Greenwich and Paris.

In the following pages, I will expand on the meridian issue after discussing the *ilanname*. I use eight *ilannames* published between 1861-1864. The number of lines and the lighthouses announced differs from one document to another. I examine

¹⁶⁰ Les navigateurs sont prévénus que les deux feux ci-après désignés seront allumés le 1er octobre 1863. Les longitude qui détermenent les positions sont comptées d'après les meridiens des observatoires de Greenwich et de Paris. Les Aires de vent sont rapportées au méridien vrai chaque lieu. COA, HR.İD. 916.6 -also all of the *ilannames* could be seen at appendix C

the announcements, not by document, but in groups based on the lines to which they belong. These lines are Rumelia and the Black Sea, the Bosphorus, Carmanie (Alexandretta or İskenderiye) and Syria, Archipel (Aegean islands), Rhodes, Samos and Chios, Smyrna (Izmir), Mytilini, and the Marmara Sea. For each line, I list the lighthouses, noted in the *ilannames*, chronologically trace dates, and discuss examples from the different types of lighthouse lines in a more detailed manner; one island line (Rhodes), one from a long line (Carmanie (Alexandretta or İskenderiye) and Syria). I examine the descriptions of location in different types of lines. Also, I should add that these documents cannot provide a complete list of lines and all lighthouses belonging to said lines. These documents are fragmentary, and they do not constitute all of the lighthouses in the general list that Thobie provided regarding the lighthouses built within the 1860 concession contract.

4.2.2 The Lighthouse Lines Listed in the Ilanname Documents

Lighthouses from Charmanie and Syria Lines are mentioned in five different *ilanname* documents. The first document dates to October 1, 1863, and it notifies the illumination of Beirut Cape and Beirut Port lighthouses.¹⁶¹ These are the lighthouses mentioned in the correspondence documents about the lighthouses in Beirut; regarding the incident of an officer demanding light fees. The location of Beirut Cape Lighthouse is defined as, on the top of the N. 0. point of the Beirut cape called "Beirut Raz" (which could be the Ra'sü'l-Beyrut quarter mentioned above), and at about 300 meters from its end. The location of the Beirut Port Lighthouse is described to be on the low point of the ruined fortress near the customs. The second notification document also concerns the Beirut Cape Lighthouse. Dated October 28,

¹⁶¹ COA, HR.İD. 916.6

1863, this document notifies the misinformation regarding the Beirut Cape Lighthouse.¹⁶² The elevation of the lighthouse from the ground and the range of the light described in the first document are stated incorrectly. In the first document, the height of the light has been indicated incorrectly as 30 meters above sea level and at about 300 meters from the end of the Cape. The correct information would have been 38 meters instead of 30, and the distance should be indicated as 400 meters instead of about 300.

The following *ilanname* document is concerned with Alexandrette (*İskenderun*), Latakia, and Jaffa lighthouses. These lighthouses were scheduled to be illuminated on April 1, 15, and 23, 1864,¹⁶³ respectively. The Tuzla Lighthouse had the notified date of November 15, 1864, for illumination in its *ilanname*.¹⁶⁴ The notification document with the latest date in the Charmanie (Alexandretta or *İskenderiye*) and Syria Line, July 27, 1866, involves two lighthouses: Sour Port (Old Tyr) and Saida (Old Sidon or Sayda).¹⁶⁵

The Rhodes line has two lighthouses listed. The two lighthouses, Port of Rhodes and Moulins Point (Mill Point) or Kum Burnu listed in the notice document, were also called lines. These lines linked canals, coastlines, and points on islands or groups of islands. On the global scale, their existence on the same peninsula makes them more of a point, but they are listed as island lines. Port de Rhodes lighthouse was the subject of the document about demolishing the old tower in order to build a lighthouse. It is described as on the tower of S. Elme, assuming that was the ruined

¹⁶² COA, HR.İD. 916.8

¹⁶³ COA, HR.İD. 916.14

¹⁶⁴ COA, HR.İD. 916.36, Tuzla is listed with its old name Larnaca

¹⁶⁵ COA, HR.İD. 916.46

tower. Location of Moulins Point is defined on the point called "des Moulins" and at a distance of 120 meters from its extremity in the document.¹⁶⁶

Rumelia and Black Sea Line also includes the Dardanelles Shores, and this is the earliest line that the Lighthouse Administration worked on. There are lighthouses listed in the earliest, and the only handwritten *ilanname* to which I was able to access is dated 1861. This *ilanname* contains Rumelia and the Black Sea Line; all other *ilanname* documents are printed. The Seddül Bahir, Burgaz Point, Point Keffis of the Barbiers (Kepez) are listed in the 1861 notification document.¹⁶⁷ In another notification document dated August 15, 1863, the longitude of the Galata lighthouse was corrected. The last notification document has an illumination date of July 15, 1866, concerning Cape Kouri and Cape Kalacria lighthouses.

The lighthouses in Marmara Sea Line are listed in the two *ilanname* documents with the lighting dates July 16, 1861, and December 6 and 10, 1863. The Cape Koza, Héraclée (Ereğli), Koutaly (Ekinlik Island) and Palaïo Point (Near Paşabahçe) are listed in the early notification document.¹⁶⁸ The scheduled lighthouses in the late document were Zeytin Burnu, with the lighting date of December 6, 1863, and Dil Burnu, with the lighting date of December 10, 1863.¹⁶⁹

The lighthouses in the Bosphorus Line and the Aegean Islands lines were listed in the same *ilanname* of 1861. This *ilanname* is the only handwritten *ilanname* I have encountered, the other *ilanname* documents are printed, and the dossier included three handwritten copies of the *ilanname*. The Bosphorus Line consists of Kandilli, Kanlıca, Yeniköy, Kavak Fort, Umuryeri, Therapia (Tarabya), Point J'ezen, and Rumeli Hisar. The Aegean Line consists of Cape Sigri in the Western Side of the

¹⁶⁶ COA, HR.İD. 916.11

¹⁶⁷ COA, HR.İD. 916.1

¹⁶⁸ COA, HR.İD. 916.1

¹⁶⁹ COA, HR.İD. 916.9

Lesbos Island, Point Ponente (West point of Bozcaada), and Geyikli. All of them are listed in the handwritten *ilannname* of 1861, with the expected lighting date of July 16, 1861.¹⁷⁰

The lighthouses in Smyrna Line and Mytilini Line are listed in the same *ilannname* with an expected illumination date of October 1, 1863. The lighthouses of the Mételin Line listed in the *ilannname* are; Cape Bozcaada, Mytilini Point, Mytilini Port. The listed lighthouses belonging to the Smyrna Line are Cape Mermindji (at the entrance of the Smyrne/Izmir Gulf), Süzbeyli, Kedek, Sancak Shore.¹⁷¹

The lighthouses in Samos and Kos Line are listed in the *ilannname*, which has the lighting date of January 31, 1864. The document contains lighthouses; Gulf of Vathi (North of Samos), Tigiani Port (South of Samos), and Scala Nuova (Kuş Adası).¹⁷²

The lighthouses in Chios Line are listed in the *ilannname* dated October 1, 1863. The document covers Ile Spalmadore, Pacha et Vatou, Port of Chios, Ilot de Paspargos lighthouses.¹⁷³

4.2.3 A Matter of Longitude

In the *ilannname* documents, the locations of the lighthouses are indicated with Latitude and Longitude. The exciting matter here is the declaration of longitude. Longitude is given with reference to both the meridian of Greenwich and the meridian of Paris. The works and studies regarding the establishment of the Paris Meridian go back to the late seventeenth century, being worked for over two hundred

¹⁷⁰ COA,HR.İD. 916.1

¹⁷¹ COA, HR.İD. 916.6

¹⁷² COA, HR.İD. 916.13

¹⁷³ COA, HR.İD. 916.6

years. The Paris meridian runs through the Paris Observatory in Paris, France; 2° 20' of longitude east of the Greenwich Meridian.¹⁷⁴ As an interesting fact, I have come across, while looking into the navigational background of the meridian establishment; I have found out that the Christiaan Huygens telescope was a fundamental part of the calculations regarding the Greenwich Meridian. Apart from his telescope, Huygens is the founder of the Huygens theorem, which was part of Augustin Fresnel's studies. Fresnel is the inventor of the Fresnel lens used widely in lighthouses. During the beginning of the 1850s, an instrument was invented by the British royal astronomer George Biddell Airy, now called The Airy Transit Circle (telescope). This telescope took the first observation on January 4, 1851.¹⁷⁵ The observations done with this instrument specified the Greenwich Meridian. Murdin explains this instrument and its level of development with respect to the navigation requirement of naval transportation:

This instrument, and as it has come to be today, producing observations of unprecedented accuracy. Their accuracy and that of the calculations, coupled with the emergence of Britain as the dominant marine power and the extensive Empire over which it had influence, meant that the British system of latitude and longitude came to predominate over the French, as I shall relate in this chapter. Having found the latitude and longitude, a sailor would need to relate this to his position on the sea, meaning he would need to have accurate maps of the continents' sea, islands, and coastlines.¹⁷⁶

The emergence of the newly defined Greenwich meridian in parallel to the Paris meridian, which had been used and developed for almost two centuries, created confusion. The United States, with the order of the U.S. President Chester A. Arthur, U.S. Navy, U.S. Signal Office, and Secretary of the Railway Time Convention, organized a meeting in Washington DC in 1884 to address the international uncertainty and develop a longitude and time zone system throughout the world. The

¹⁷⁴ Murdin, *Full Meridian of Glory*, 129-143.

¹⁷⁵ "Airy Transit Circle."

¹⁷⁶ Murdin, *Full Meridian of Glory*, 131.

international ambiguity was due to the increase in trade and global communication, which intensified even more in the nineteenth century with the technological developments. The United States (and Canada) had decided that a Greenwich-based system would be more appropriate for railroad owners.¹⁷⁷ The navigational tools were also fundamental for maritime activities, and the technological development of steamship technology went hand in hand with the changing navigation technologies. In the further section of this chapter, I discuss another type of navigational development, cartographical activity, and indubitably lighthouses.

4.2.4 Imposing the Contract and Tariff of 1856

From the *ilannname* documents, the increasing construction activity of the lighthouses during the first half of the 1860s is quite evident. The enforcement of 1856 tariffs for these lighthouses was not easy. The previous chapter covered the issue of opposition about the determined lighthouse fees stated in 1856 tariffs. Regarding the application of the tariff of 1856, there was significant backlash from the steamship companies such as The Lloyd Company, The British Peninsular and Oriental (P&O) Company, Messageries Maritimes Company, and Russian Steamship and Trade Company. The contestation was still going on during the 1861-63 period. Thobie points out that the usual suspects of this reaction are; Sir Henry Bulwver, whom we know from the opposition when the 1856 tariff was first published, and the Müşavir Pacha, alias Adolphus Slade, Admiral of the Port of Constantinople. They had another party supporting them, a rather powerful one: a newspaper, the *Levant Herald*, published periodically between 1861 and 1863. The newspaper launched what Thobie called a series of attacks against the Directorate of Lighthouses and tried to rally local public

¹⁷⁷ Murdin, *Full Meridian of Glory*, 137.

opinion. This opposition was correlated with the impact lighthouse fees had on steamship transportation and maritime trade. As stated above, the 1856 tariff of lighthouse fees states the amount of lighthouse fees must be paid by the steamship company according to the tonnage of the steamships. Such payment would have a direct and powerful impact on the maritime trade. Hence as a great expenditure item. The local public opinion problem concerning the *Levant Herald* was resolved in 1861. Michel and Collas won the defamation lawsuit that they had brought against the *Levant Herald*. Collas won his case in front of the consular court of the British SM; Mr. Mac-Loan was condemned to £50 of the fine and the expenses of the lawsuit as the defaming party. Still, the issue was not solved completely. The Ottoman government – in a somewhat surprising decision - instructed Camille Collas to go to London to deal with the English obstacle and agree with them directly around late 1862. The issue was settled in 1863 on Collas' second visit to London the same year.¹⁷⁸

While the construction of lighthouses gained momentum and the issues about collecting the lighthouse fees were resolved, the French and Ottoman Empires recognized Marius Michel's work on the lighthouse construction and operation. On December 31, 1863, by the proposal of the Minister of the Navy and the Colonies, Commander Michel was knighted in the order of the Legion of Honor. As I have already mentioned in the previous chapter, Sultan Abdülmecid, wanting to reward Commander Michel for the "dedication he had shown throughout the time of his service" towards the Ottoman government, conferred to him the fourth class (officer)

¹⁷⁸ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*. 25-30.

of the imperial order of the Mecidiye in 1859. He was elevated to the rank of commander by Sultan Abdülaziz on July 17, 1869.¹⁷⁹

In the time in-between, in 1864, a document in the Ottoman Archives states Michel's moving out from Beyoğlu.¹⁸⁰ Assuming that most of the construction process was completed, Marius Michel could decide to go back to France even though the building was not entirely completed. Especially since the contract clearly states the management and administration of the service could be fulfilled by a delegate residing in Constantinople. Marius Michel's relocation could be the case since, in the year 1865, Marius Michel became the Mayor of the Sanary-Sur-Mer. During his first term as mayor (1865 - 1872), Marius Michel became interested in maritime issues. He notes that in Sanary, as in Istanbul, the quays were not satisfactory for the berthing of boats and needed to be strengthened in order to ensure the unloading of heavy materials. He was, therefore, determined to build new ones. As for the Port itself, major filling works (development of open spaces conquered from the sea) were initiated.¹⁸¹

4.3 Navigational Developments and Lighthouses

So far in this chapter, the aftermath of the 1860 contract is discussed in terms of building activity, tariff imposition, and the occurrences in Marius Michel's life. The intensified lighthouse construction in the Ottoman shores and islands is pretty distinguishable. Lighthouses were not the only navigational development assuring the safety of maritime activities. This section discusses other examples of marine developments linked to regularized steamship transportation, such as establishing the

¹⁷⁹ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

¹⁸⁰ COA, A.}MKT.MHM.309.96

¹⁸¹ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

navigation standards with the Greenwich Meridian and navigational practices within the example of a hydrographic survey of the Red Sea. Navigation is a complex issue that also includes practices of cartography apart from the establishment of lighthouses to provide navigational safety of maritime transportation. In this part, I investigate the other navigation methods connected to lighthouses, following from the study of Alexis Wick, which he discusses within his broader narrative of the Red Sea, including the hydrographic practice of making a cartographical survey of the physical features included in the coastal and oceanic area of the Red Sea. I continue with the increasing frequency of steamship transport and its correlation with the need and use of the lighthouses.

Wick mentions two navigational guides authored by James Horsburgh, which were built on the original study of Alexander Dalrymple. The final work, which consists of two volumes published in 1809 and 1811, produced via the laborious investigation of several ship records and memoirs, would become the essential reference for guiding the eastern seaways.¹⁸² The first half of the nineteenth century witnessed the establishment of navigation guides, cartographic studies, and scientific surveys of the sea in a systematic fashion. The navigation and the safety of the sea were a concern from the beginning of the nineteenth century, and the works to provide security increased alongside technological developments. These developments have a wide range, extending from cartographical practices to the development of optical equipment. Parallel to this process, maritime navigation became a more serious issue with the development of steamship technology since steamship traveling became more frequent. Wick engages us with a type of navigational practice with an emphasis on navigational safety; cartographical

¹⁸² Wick, *The Red Sea*, 133-141.

description of the physical features of the Red Sea. This practice includes the underwater reefs within the scientific construction of the Red Sea. I have already covered a part of the navigational practices in the first section of this chapter under the matter of longitude and the development of the Greenwich meridian. This matter included but was not limited to the navigational advances in cartography. Wick, in his work, narrates the cartographical survey of the Red Sea to detect the hazards of the sea in the 1830s. This work of cartographical survey as a navigational practice to provide assistance in maritime transportation should be underlined in terms of a launch of the navigation before steamships became a consistently used technology.

Wick describes this situation as follows:

The actual regularization of steam travel in the Indian Ocean would take a few decades. This was in large part due to technical matters that maintained the superior efficacy of sail over steam. As Daniel Headrick has shown, it was only in the 1850s and 1860s that "four innovations . . . lowered costs and improved the competitive position of steamers vis-à-vis sailing ships: the screw-propeller, the iron hull, the surface condenser, and the compound engine." In the early 1850s, steam navigation in the Red Sea was still a rarity.¹⁸³

Navigational practices such as cartography aiming to provide safe transportation were an integral aspect of maritime travel since the beginning of the nineteenth century. Advancements in geographical studies were an aspect navigational practices, as well as the lighthouses. The changed element within the technology was the increased regularity of maritime activity due to steamship technology. Barak explains this relationship in his work "Powering Empire: How coal made the Middle East and Sparked Global Carbonization" under two significant aspects: environment and risk. In the environment section, the necessity of coal depots for steamships to access the coal within the long trips along the coal corridor Barak demonstrates from

¹⁸³ Wick, *The Red Sea*, 147.

London to Bombay is emphasized together with the other infrastructural elements needed to support this corridor in terms of navigation and establishment of Archipelago to provide depots. The environment chapter considers the lighthouse as both the infrastructural support is provided along this axis and an expression to trace the development along this axis. The risk section leans on to the accidents that occurred along this corridor, emphasizing the Red Sea, stressing the need for navigational safety. This study is revolved around the use of coal in the 19th to 20th centuries. Barak carries a bifold attribute for this study.

The steamships (as well as trains) and the steam engine development were dependent on coal, and the steamships were critical to carrying huge cargoes of coal. The access to coal and transportation of coal needed its own network and technology. Steamers could manage their load and buoyancy as they passed through an increasingly interconnected web of depots by exchanging coal, water ballast, and salt.¹⁸⁴ This web included an extensive range of infrastructural support, from creating the artificial Archipelago and the chain of depots on natural islands conditioned along the corridor of London and the East India Company capitals of Bombay and Calcutta, to the telegraph network both visible and underwater. The depot network is supported by coastal connections of lighthouses and submarine telegraphy, made possible by steamships' continuous, linear velocity and their ability to install wires uniformly. The infrastructure and the supply of such a system were developing together with technology – lighthouses, and telegraphy were significant cases of it. Barak describes this issue as follows: "...weight and light fees incentivized the clustering and spread of lighthouses near coal stores"¹⁸⁵

¹⁸⁴ Barak, *Powering Empire*, 129.

¹⁸⁵ Barak, *Powering Empire*, 132.

The central aspect here was the factors that the developing technology enabled. Regarding these factors, I have considered the increase in the number of trips with steamships and the total rise in maritime transportation. I have emphasized this correlation between the emerging steamship technology, developing regular steam travel in the area, and the need for lighthouses as an infrastructural aspect. In comparison, Barak introduces two factors in terms of what developing technology enables. The first aspect coincides with the intensification of maritime travel and voyages due to the use of coal, instead of wind as source of energy. The shift in the energy source enabled steamers to make trips any time of the day or the year. The second attribute concerns the steamships' size and carrying capacity, hence increasing hazard possibility, especially in challenging locations. In addition, the weight increases also meant an increase in the light fees since they are calculated according to the weight a steamship carries. As I stated above about the sections Barak included concerning lighthouses and their necessity, while he states the need for coal directly correlated with the increasing use of the steamships, he articulates the increased number of accidents and navigational support required for frequent steamship transportation.

Barak formulates those two factors since both indicate possible accidents in the sea, creating a maritime safety issue that requires the help of technological development and technical support. The Suez Canal construction resulted in a significant increase in naval transportation, hence the naval safety issue. The increase in both the number of trips and the ship sizes were factors of risk. Barak articulates this issue as follows:

Ship design and technical features were also informed by other characteristics of the east-west voyage. For example, since its inauguration, the Canal's narrow waterway promoted screw-propelled steamers and demoted side-wheelers, which hit the banks with their propellers, and sail ships, which

depended on costly towing services for the entire stretch between Suez and Port Said. The Canal itself kept changing during its first decades it was continuously widened and deepened, a process which both suited and informed the changing size of the steamers that passed between its banks. Ships' shape and geography recreated one another.¹⁸⁶

The Suez Canal and the changes it brought in terms of maritime safety are momentous. Barak conveys this issue both from the aspect of environmental change and the increasing size of ships. Both of the factors are precarious. Any kind of environmental change, especially in geography with many reefs like the Red Sea, could be perilous. The technology enabled the transport of coal and at the same time required coal for more carrying capacity; hence, the enormous steamers were also a risk factor for accidents. In such a situation, lighthouses were an essential part of maritime security and navigation as an infrastructural element, and lighthouse construction indeed experienced a prosperous era throughout the second half of the nineteenth century. In this chapter, I will discuss the 1850-70 phase of this as part of the repercussion of the first lighthouse concession agreement.

4.4 The 1850-1870 Period Regarding Lighthouses

In this part, I demonstrate the increase in lighthouse use and production with the help of the revenue tables and maps.¹⁸⁷ The tables originated from the revenue tables that Thobie created in his work based on the accounting books of General Administration of Lighthouses and Journal de Paris.¹⁸⁸ The maps of the Mediterranean and the Indian Ocean in 1850 and 1870 are from the book *Powering Empire* by On Barak.

¹⁸⁶ Barak, *Powering Empire*, 124.

¹⁸⁷ Barak, *Powering Empire*, 123. Barak states he created these maps from multiple sources

¹⁸⁸ To be more exact the documents were Administration Generale des Phares, Grand Livre, Constantinople, Volumes A to N period 1861-1940 Journal de Paris, Volumes A to I, for the period 1860 1959. These documents Thobie had been authorized to consult, in 1970, by Mr. Guy des Closières, when the archives of the Collas and Michel Company were located at 15 rue La Pérouse in Paris, were not transmitted to the National Archives of Aix-en-Provence. Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*. 77.

The focus of On Barak's book is the coal corridor stretching from London and to the East India Company capitals of Bombay and Calcutta. Therefore, he did not include the lighthouses along the Black Sea. I have marked the lighthouses in the Black Sea line constructed between 1855-1870 with yellow. I utilized the locations listed in Thobie's work to do so.¹⁸⁹ He divides the marine engine development into phases, starting with 1830–50 as the early first period. In this chapter, the second period he devised will accord with the first lighthouse concession aftermath. On Barak describes these periods as:

... 1830–50, this early period is defined by equidistant coal depots along a single line stretching from Gibraltar via Aden and Ceylon to the Indian ports of Bombay and Calcutta, the two capitals of the EIC. The second period in question (1850–70) saw technological innovation in both ship design and engine efficiency (mainly screw propulsion and iron and later steel shipbuilding). In the 1860s, the development of compound steam engines that used the same steam twice (expanding steam via multiple cylinders of progressively lower pressure) proved more energy-efficient and allowed engines to sustain higher pressures. The opening of the Suez Canal in 1869 drove the infrastructural explosion evident in the third period, in figure 14. Technologically, steamers could now carry cargo as well as mail and people. By the 1890s, the triple expansion engine, which worked at two hundred pounds per square inch (psi), had come into use, taking engine coal-consumption efficiency to its pinnacle during that era. By then, the depots system had stabilized, and the last of the major coaling stations was established during this decade.¹⁹⁰

¹⁸⁹Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel*, 1860-1960.

¹⁹⁰ Barak, *Powering Empire*, 123.



Figure 6 Mediterranean and Indian Ocean Lighthouses in 1850 and 1870 The author added Black Sea Lighthouses ¹⁹¹

Here the periodization became an issue because the Collas and Michel Company was established in 1860. Consequently, the periods laid out by Thobie and On Barak do not entirely overlap. Moreover, the accounts were recorded starting from 1862, and the data regarding the years 1860 (three months), 1861, and 1862 are rearranged.

¹⁹¹ Barak, *Powering Empire*, 131.

Therefore, the revenue numbers begin with 1862. Still, the revenues are outstanding during 1862-1873, with 11.201 million francs. Before moving on to the numbers, I should include a short section regarding the expenditures of the Collas and Michel Company and their relationship with the Lighthouse Administration.

The expenditure elements were financial costs, operating costs, the cost of installing new lighthouses and lights. The economic costs were due to the specificities of the Ottoman monetary system, grouped under the title "agio." The operation costs included the maintenance costs of the lighthouses, the cost of salaries of the employees, and various supplies, which were the highest and most repetitive, and establishment costs. A percentage of the revenue from the collection of lighthouse fees on all established and future lines was allocated to pay the concessionaires for the costs of the lighthouses. This percentage would vary over time.¹⁹²

Table 2 shows the profitability of the Lighthouse Authority divided into five-year periods. Although the profits are outstanding, as seen in Table 2, the first years' profit appears to be below average, compared to the broader period of 1862-1913. This drop is related to the expenditures of the lighthouse construction activity. The unusual drop during 1874-1878, compared with the broader period of 1862-1913, is explained by the 1877 Russo-Ottoman war.

¹⁹² Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 75-86.

Table 2 Profits of Collas and Michel Company (%Five-year periods)¹⁹³

Five-year periods	As a percentage of total revenue	As a percentage of total benefits	Relative share of concessionaires in revenues. (profitability) % of revenue
1862-1868 *	41,3	65,9	52,6
1869-1873	48,4	68,8	62,1
1874-1878	39,9	62,8	46,4
1862-1913	33,6	59,6	43,2

Thobie, regarding the relationship between revenue and construction activity, remarks:

In the very first years, until 1868, the agio is very low, and the operating expenses oscillate between 300.000 and 500.000 F, but the first three years are increased by the installation of new lighthouses. From 1869 onwards, as the network grew, the agio and operating costs increased and stabilized, the former between 110,000 and 150,000 francs per year and the latter between 700,000 and a small million francs. It remains to explain the accidents to a curve quite regular."¹⁹⁴

This increase in lighthouse construction activity and the establishment of the lighthouse network are quite visible. From the maps of lighthouses in the Mediterranean and the Indian Ocean in the years 1850 and 1870, the increased number of lighthouse lines along the Bosphorus line, shores of Dardanelles (Rumelian-Black Sea Line), Eastern Mediterranean (Charmanie (Alexandretta or İskenderiye) and Syria Line), and even some at the Red Sea is very legible. The formation of the network had its costs, but even then, the profits were extraordinary. The outstanding yields were correlated with the regularized and enhanced steamship traffic due to the improvements in the steam engines. Thobie created a graph

¹⁹³ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel*, 1860-1960,83.

¹⁹⁴ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel*, 1860-1960,83.

displaying the revenue curve that essentially parallels that of the growth of the Ottoman Empire's maritime movement. The maritime traffic is calculated from the tens of thousands of barrels registered. The graph (fig 6.) is essential for displaying the increased naval activity and exemplifying its direct correlation with the lighthouse fee revenues.

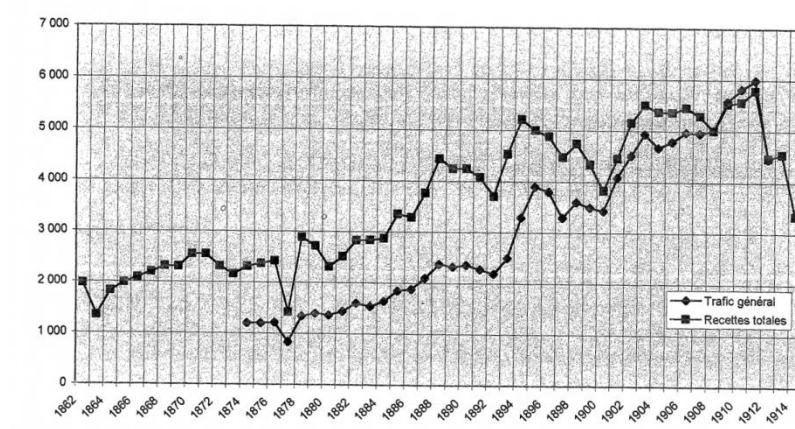


Figure 7 General maritime movement of the Ottoman Empire (in tens of thousands of tons of register) and total income of the Lighthouses (in thousands of francs)¹⁹⁵

4.5 The Suez Canal

The Suez Canal is considered the most significant infrastructural development for nineteenth-century steamship travel. Searight notes, "The opening of the Suez Canal in 1869 - celebrated with fireworks, the presence of several royal steam yachts, several groundings and a banquet prepared by 500 cooks and served by 1,000 waiters - meant that ship travel to India became almost routine."¹⁹⁶ In the third chapter, I have talked about Ferdinand de Lesseps, who founded the Universal Company of the Suez Canal. From his memoir (and the letters inside), we know that

¹⁹⁵ Thobie, L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960. Pp 246

¹⁹⁶ Searight, Sarah. Steaming East: The Forging of Steamship and Rail Links between Europe and Asia. London: Bodley Head, 1991. Pp2

the Suez Canal was an idea he had since, at least, 1852. In 1854, a ferman from the khedive (viceroy) of Egypt, Said Pasha, authorized the construction of the Suez Isthmus. Four years later, Ferdinand de Lesseps established the Universal Company of the Suez Canal, a ninety-nine-year concession was granted for the Canal's opening. The construction work was carried out in two stages, from 1859 to 1863 and from 1866 to the inauguration in 1869.¹⁹⁷ The Canal was the outcome of the need for infrastructure to facilitate the regularized and exaggerated steamer traffic and enabling the coal corridor to the Archipelago. The inauguration of the Suez Canal in 1869 also meant an increased number of steamer accidents due to increased steamship sizes and traffic flow. The maritime security, therefore lighthouses, were relative to the issue. The entrance of the Canal from the Mediterranean is Port Said. The establishment of the Port Said lighthouse, finalized a few days before the Canal opened, was "completed a few days before the festive inauguration of the Suez Canal, was one of the first major structures built with reinforced concrete by the inventor of this building system, François Coignet."¹⁹⁸ The issue of the lighting of the Red Sea after the Canal's opening was perhaps the biggest concern of the Ottoman Lighthouse Administration after the second concession agreement was signed on July 12, 1879.

¹⁹⁷ Bernhard, Ferdinand, Thobie, Jacques. 2007. " Le rôle de Michel Pacha dans l'administration générale des phares de l'Empire ottoman ". In *Michel Pacha Actes Du Colloque*. 2007. pp 61-85.

¹⁹⁸ Barak, *Powering Empire*.pp 130



Figure 8 Port Said Lighthouse in the entrance of Suez Canal ¹⁹⁹



Figure 9 Suez Canal ²⁰⁰

¹⁹⁹ Istanbul University Rare Works Collection (Hamidian Visual Archives) , 90492 -0003

²⁰⁰ Istanbul University Rare Works Collection (Hamidian Visual Archives) , 90492 -0002

4.6 The Second Concession Agreement in 1879

In February 1877, Collas presented Rauf Pasha, the Minister of the Navy, a draft contract concerning the construction of 16 additional lighthouses on behalf of an extension of the Concession by fifteen years. The Minister of the Navy agreed while the State Council was seeking an increase in the current share of twenty-two percent from the lighthouse revenues. The discussions regarding this concluded with an agreement to raise the percentage from twenty-two percent to twenty-six-point five percent, and the State got fifty percent of the excess over the previous five years on average. The Concession was extended for a period of fifteen years. The extension occurred in May 1879, and the process still did not conclude until the cut of the State was increased from twenty-two percent to twenty-eight percent in June 1879.²⁰¹ On June 12, 1879, the Additional Convention to be annexed to the Convention of Lighthouses, concluded on August 8/20, 1860, was signed by the Minister of the Navy, Grand Admiral of the Empire, Mehmet Rasim Pasha, Collas, and Michel. The contract consisted of nine articles. The most remarkable difference between the first and the second concession contract was the inclusion of the Archipelago and the Adriatic Gulf. These locations were added to the sites mentioned in the 1860 concession contract, such as the Black Sea and the Mediterranean. These locations were selected for the building of nineteen new lighthouses.²⁰² The discussed issue of revenues is stated in the sixth article as follows:

Art. 6 - The Imperial Government will continue to receive, as in the past, 22% on the gross proceeds of the lighthouse fees until September 4, 1884, the term of the first Concession. From this date of September 4, 1884, and until September 4, 1899, the term of the first Concession, the Imperial Government will continue to receive 22% of the gross proceeds of the lighthouse dues.

²⁰¹ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 31-35.

²⁰² COA, HR.HMŞ.İŞO 71.2 also could be seen at appendix B

The State's share of the gross profits of the lighthouse fees will be raised to 28%.

At the end of the term of the first Convention, the total income from lighthouse fees collected during the previous seven years shall be averaged, and if during the fifteen years of the Concession the annual income exceeds the average, 50% of the surplus shall belong to the Imperial Government.²⁰³

The new agreement was signed with a compromise made by Collas and Michel.

They compromised from their share of the lighthouse fees, decreasing it to 72%, to continue holding their concession rights. Considering the increasing revenues until the 1870s, examined above in Table 2, lighthouse construction is promising and an excellent investment to continue. Especially in 1879, 10 years after the Suez Canal construction, the potential of illumination of the Red Sea must have been appealing to the concessionaires. As a result, this compromise by six percent in revenues probably seems less like a compromise and more like an investment.

²⁰³ COA, HR.HMŞ.İŞO 71.2 also could be seen at appendix B

CHAPTER 5

MARIUS MICHEL'S WORKS IN OTTOMAN EMPIRE BETWEEN 1879-1894

5.1 Introduction

Up to this point, lighthouse construction in the Ottoman Shores in the 1855-1879 period was narrated. In the second chapter, I discussed how the lighthouses become necessary elements of infrastructure networks as the intensity of maritime travel increased during the nineteenth century. Then, in the following chapters, I touched on Marius Michel's works in the Ottoman Empire during 1855-1860, until the establishment of the Collas and Michel Company, and Marius Michel's efforts in the Ottoman Empire during 1860-1879, until the second concession agreement. This chapter will cover lighthouse construction activities after the second concession agreement until the third concession agreement, signed in 1894, along with other infrastructural investments by Marius Michel and Bernard Camille Collas, such as quay and railroad construction. As in the other chapters, the lighthouse narrative will follow Marius Michel's life. In this chapter, first, I talk about Marius Michel becoming Michel Pasha a few months after the second concession. In the same year, Michel Pasha signed another agreement for the privilege of building and operating the Istanbul (Eminönü and Galata) Quays. I will also touch upon the extension of the quay concession and the construction process agreement signed between Michel Pasha and the Ottoman State. As I have already briefly stated in the introduction chapter, the intertwined network of infrastructures was formed with the assembly of different types of infrastructure webs, which are uneven in terms of their complexity. The fragments of the interconnected infrastructure network are non-identical. In my argument, their similarity is strongly emphasized with regard to their function of

supporting the intensified maritime travel during the nineteenth century rather than their different qualities. Considering the scope of this thesis, I will just focus on the fundamental differences between the lighthouses and quays. This difference could be evident only with the numbers of Marius Michel's structures acquired the concession rights and managed the construction. While Marius Michel directed the building of all of the Empires' lighthouses, their numbers exceeding a hundred, the only two quay projects he directed were located in Istanbul. Definitely, Istanbul was the capital of the Empire and a historic port city with multiple layers; therefore, any construction process in Istanbul is more complicated. Together with the peculiarity of Istanbul, there were two major differences between the making of quays and lighthouses. The first factor coincides with Istanbul being a historic port city; the construction of quay must be done on top of an existing, thus functioning port, where there is ongoing trade.²⁰⁴ The second factor is the proximity to the city. The majority of the lighthouses were located on the shores without settlements; in contrast, quays are part of the city. Erkal formulates the dock space as a strip of commercial area, where there are buildings related to the port, such as customs hotels, etc. This constitutes an interface between the city and the quay "Kordon". This almost generic situation in the Eastern Mediterranean port cities displays the proximity between the quay and the city.²⁰⁵

Furthermore, I will focus on ports and quay constructions on the Sirkeci-Unkapanı axis, Galata, and the railway construction activity in the Jaffa and Jerusalem line, and the Haydarpaşa-İzmit-Ankara line, including the building of the Haydarpaşa quay. These infrastructural elements are covered here since they are built

²⁰⁴ For further reading about the multi-layer structure of the Istanbul Port: Müller-Wiener, *İstanbul Limanı* and Erkal, *Haliç Extra-Mural Zone: A spatio-temporal framework for understanding the architecture of the İstanbul city frontier*

²⁰⁵ Erkal, "Bugün Liman Kara Olmuştur", 31-48.

with investments made by Michel and Collas. I will consider in this chapter the Haydarpaşa-İzmit-Ankara railway line as an investment attempt by Collas; since Collas was not the concessionaire of the Haydarpaşa-İzmit-Ankara railway project. Another company funded the project. Provided that, Collas was considered an investor for this project. The idea that the lighthouse concessionaries dominated the quay construction at both sides of the Bosphorus shores is remarkable. However, the project was never entirely fulfilled because Michel acquired the concession rights of the building of quays, bonded warehouses, and improved custom-house accommodation in Eminönü and Galata, while Collas could not obtain the Haydarpaşa concession. Still, Collas acquired rights of concession of the Jaffa and Jerusalem railroad.

Meanwhile, I will continue the lighthouse narrative. I will examine the general assessment of lighthouse construction activity and their use in the 1870-1890 period. Accordingly, I will evaluate the changing trends in the revenue of the Collas and Michel Company. In addition, I will include the third concession agreement, which is the last one signed before Marius Michel's death.

This chapter is significant as it displays the combination of infrastructure networks and the lighthouse network as a vital part of a global network of modern infrastructures. Indeed, the construction of the lighthouses should not be read as a singular concept. On the contrary, its links with the construction activity of various maritime and land transportation infrastructures should be considered. In this chapter, these links became very legible because the investors of the other types of infrastructure projects were the company owners, holding the lighthouse construction and operation concession rights. While these links became legible, my argument

concerning the interlinked nature of various infrastructural webs as of from the intensified maritime activity flow, is confirmed.

This chapter will consider the unevenness of the different infrastructures as I mentioned above, especially in terms of the complexity of the making of the web of infrastructure type. In this thesis, apart from the lighthouses, only the Suez Canal is mentioned, and later on, the railroads and quays will be added. These infrastructures connect not only in the geographical sense but also in terms of the people constructing them regarding the concessionaries. However, they also have their specific complexities and impacts.

Before considering Marius Michel and Bernard Collas' further investments, I want to briefly discuss how Marius Michel was rewarded for his works. A few months after the second lighthouse concession agreement, Marius Michel, who had already received several orders from the Ottoman Empire, became a pasha with the Sultan's order. On September 23, 1879, Sultan Abdülhamid raised Marius Michel's rank to the honorary rank of miralay (captain of a ship) in the Ottoman navy with an order. Then with a second-order, dated October 1, 1879, promoted Marius Michel to the second class (grand-officer) of the imperial order of the Mecidiye and, by a third patent, rendered five days later, on October 15, 1879, the honorary grade (corresponding to both the two degrees French Rear-Admiral and Vice-Admiral in the Ottoman Navy) was conferred upon him, entailing by right the dignity of Pasha.²⁰⁶ This pasha title is a title of honor, situating Michel Pasha in a highly respectable position. According to Geyikdağı, this title caused tension among the other foreigners. As she notes, "The British ambassador in Istanbul objected to Michel Pasha's new project (and perhaps to his assertive new name) ...".²⁰⁷ At this

²⁰⁶ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

²⁰⁷ Geyikdağı, "French Direct Investments in the Ottoman Empire before World War I," 525-561.

point, I also wanted to add my thoughts concerning Marius Michel's position in the Ottoman Empire. In the documents in the Ottoman Archives before Marius Michel became Michel Pasha, he is mentioned as Lights Administrator Michel.

Furthermore, after he founded the Collas and Michel company with Bernard Collas, he was still mentioned as Lights Administrator Michel in the archive documents. From this, I consider that Marius Michel was only associated with his work in the Ottoman Empire. One month after Marius Michel became Michel Pasha, he signed another concession agreement concerning the construction and operation of Eminönü and Galata Quays, dated November 23, 1879.

5.2 1879 and 1890 Concession Agreement of the Istanbul Quays and its Repercussions

According to Zihni Bilge's account, titled *History of Quays of Istanbul: The Quay, Dock and Warehouse Company* regarding the quay companies of Istanbul, the first idea of construction of a quay on the shores of Istanbul was discussed after the end of the Crimean War in 1856, during the Paris Agreement discussions.²⁰⁸ The construction of lighthouses along the shores of the Ottoman Empire was also on the agenda during the Paris Agreement discussions. In addition to these discussions, a correspondence submitted to the Ministry of Foreign Affairs by the Paris Embassy, dated February 1, 1867, is concerned with the Istanbul quays. In this correspondence document, Bernard Collas, who holds the concession of constructing and operating lighthouses together with Marius Michel, wanted to build docks and pools on the shores of the Golden Horn as trade facilities, similar to the cities of London and

²⁰⁸ Bilge, Zihni. *İstanbul Rıhtımlarının Tarihçesi*, 1955

Marseille.²⁰⁹ According to the report by British Consul Wrench, among the three presented projects, Marius Michel's proposal was accepted by the Sublime Porte in 1879.²¹⁰ As Geyikdağı notes, the British ambassador opposed the port construction project: "The British ambassador in Istanbul objected to Michel Pasha's new project (and perhaps to his assertive new title of Pasha), continuing antipathies voiced earlier; about his lighthouses."²¹¹ The construction did not start until 1892. Even in 1890, a new concession agreement was made. This was because the time gap between the date construction began in 1892 and the concession agreement date, 1879. Although the discussions for the Istanbul quays were started simultaneously, if not before²¹² the construction of quays started tens of years later than the lighthouses. This time gap lies in the complexity of the quay project in Istanbul since the port of Istanbul was existing and functioning one. Moreover, the proximity of the port to the city itself with the possibility of interruption of ongoing commercial activities and the inner-city sea transport emerges as an issue.²¹³

²⁰⁹ Bilgili, Nazire. "İstanbul Limanları'nın Modernizasyonu: DersaadetRihtim ve Anadolu Demiryolları Şirketlerinin İnşa Faaliyetleri (1890-1934)." (Master of Arch.thesis, İstanbul Technical University, 2016). 22-27.

²¹⁰ Hastaoglou-Martinidis, "The Building of Istanbul docks 1870-1910, Some New Entrepreneurial and Cartographic Data," 83-99.

²¹¹ Geyikdağı, "French Direct Investments in the Ottoman Empire before World War I," 525-561.

²¹² Erkal, Bugün Liman Kara Olmuştur: İmparatorluk-Cumhuriyet Eşiğinde İstanbul Rıhtımlarının Dönüşümü," 34. Erkal mentions that in the first idea of transforming the Golden Horn port area into a modern quay came up in 1839 ilmuhaber which is the urban codes of the planning study of Hermann von Moltke.

²¹³ Hastaoglou-Martinidis, "The Building of Istanbul docks 1870-1910, Some New Entrepreneurial and Cartographic Data," 83-99.



Figure 10 View of the Galata Quay ²¹⁴

Until 1890 there were not many applications of the first concession contract of Istanbul Quays, meaning the construction process had not started. Therefore, in 1890, the Minister of Public Works, Raif Pasha, and Michel Pasha signed a new concession agreement.²¹⁵ In general terms, the contract reveals the limits and purpose of the concession given to Michel Pasha, who later established an Ottoman company named the Dersaadet Quay, Docks and Warehouses Company. The concession agreement marked the beginning of the eighty-five years of concession privileges of constructing the quays on the shores of Sirkeci-Unkapanı and Tophane-Azapkapı. The contract also ordered construction to be set in motion in two years. Also, the agreement states that the Ministry of Public Works' approval was required for any

²¹⁴ Istanbul University Rare Works Collection (Hamidian Visual Archives), 90615 -0010

²¹⁵ Ergin, *Mecelle-iUmûr-ı Belediyye*, 2796.

plans prepared by the company regarding the construction activity. These plans were expected to be in line with the content of the agreement. Moreover, the company was also held responsible for constructing the docks between the Galata and Eminönü bridges.

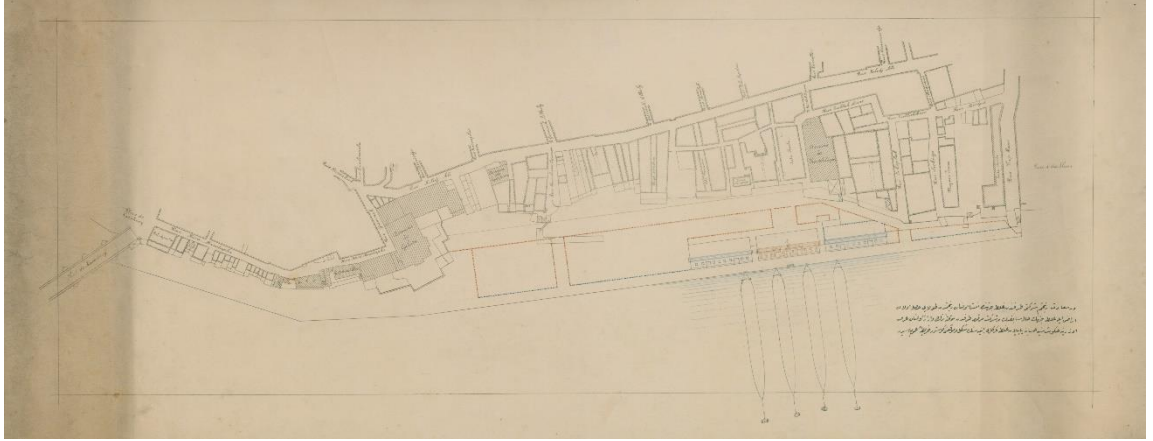


Figure 11 Project drawing of Galata Quay ²¹⁶

Galata and Eminönü Quays' construction was completed between 1892-1895 and 1895-1899, respectively. For the construction of the docks, quarries were opened in Istanbul (in Fındıklı, Kağıthane, and Silahtar districts) and its surroundings (in Kınalı, Hayırsız, and Burgaz Islands) to supply marine filling materials.²¹⁷ Moreover, when these quarries became insufficient, new quarries were opened in Sivri Ada Island and the entrance of the Danube River from the Black Sea.²¹⁸ In the second chapter, I have explained that the quarries were opened for the material needed for the quay construction, and steamships were used to carry material from these quarries.

²¹⁶ Istanbul University Rare Works, Collection (Maps and Plans), 93416 -0002

²¹⁷ Bilgili, "İstanbul Limanları'nın Modernizasyonu: Dersaadet Rihtim Ve Anadolu Demiryolları Şirketlerinin İnşa Faaliyetleri (1890-1934)." 22-32.

²¹⁸ Bilge, *İstanbul Rihtimlerinin Tarihçesi*, 4.

The quay projects are interlinked and directly correlated with the growing volume of international sea trade fueled by the technological development of steamships. As in the case of lighthouses, port and quay projects were expected to meet the rising volume of maritime traffic. Significantly, quay construction was closely intertwined with lighthouse construction. The subject of quay construction in Thessaloniki could be an appropriate example of this symbiotic relationship. In the Thessaloniki port construction specifications of expenses and obligations, dated 1892, the lighthouses are listed among the utilities that had to be constructed alongside quay structures.²¹⁹ Furthermore, during his first period as the mayor of Sanary-Sur-Mer in 1865-1876, Marius Michel initiated quay construction in his town.²²⁰ Hastaoglou-Martinidis claims that the inspiration for the Eminönü and Galata quays was linked to the increasing construction activity in the south of France:

"In December 1895, 758 meters of docks in Galata were completed, built on concrete blocks in the example of the Marseilles Quays. Along the narrow embankment, a street of 19 meters, wide by the standards of the time, was laid down, with a parapet of eight meters to allow loading and unloading."²²¹

5.3 Bernard Collas' Investments

In this section, I will talk about Bernard Collas' investments regarding the acquirement of construction and operation concessions of the Haydarpaşa-Izmit-Ankara and Jaffa Jerusalem railway projects. Collas could not obtain the Haydarpaşa-Izmit-Ankara concession rights; therefore, I used the title "the Haydarpaşa Attempt." The reason behind this title is also correlated with the Haydarpaşa quay project. The

²¹⁹ Meropi Anastassiadou, *Tanzimat Çağında Bir Osmanlı Şehri Selanik (1830-1912)*, 136.

²²⁰ Office de Tourisme de Sanary-sur-Mer, "Exposition Michel Pasha".

²²¹ Hastaoglou-Martinidis, "The Cartography of Harbour construction in the Eastern Mediterranean cities: Technical and Urban Modernization in the Late Nineteenth Century," 90.

Haydarpaşa quay was planned and built later with the concessionaires of the railway project.

To put it another way, the Haydarpaşa project included a quay project as well, like the projects of the Eminönü and Galata Quay, which Michel Pasha worked on. The second railway project was the Jaffa-Jerusalem railroad. The Jaffa-Jerusalem project started with a potential of high profit, but in the end, it did not reward its investors. Nevertheless, the success of these projects is not the primary concern here. I intend to display the interlinked nature of the diverse infrastructures and their central aim of facilitating the intensified maritime activity. The connection between the Haydarpaşa quay project and hajj travel shifting from land to sea routes created a need for the discussed railway projects.

5.3.1 The Haydarpaşa Attempt

The information regarding the Haydarpaşa-Izmit-Ankara railway line, together with the construction of the port quay and the Haydarpaşa train station, is complicated due to the changing financiers. Sultan Abdülaziz issued a decree for a railway network covering the whole Asian territory in 1871. The hardships of such a massive project became clear while implementing rails from Haydarpaşa to Izmit. Nonetheless, the Ottoman empire could not obtain the necessary finances for it, and it was short of personnel with professional knowledge. The shortage of personnel was solved in 1872 when German engineer Wilhelm von Pressel was hired for the railway project. Provided that, the financial problem was not solved until the end of the 1880s.²²² As Christensen notes, Wilhelm von Pressel was hired for the Imperial Turkish Railway Company by Maurice de Hirsch, "wealthy Bavarian-born financier and

²²² Özyüksel, Murat. *The Berlin-Baghdad Railway and the Ottoman Empire*, 15-25.

philanthropist... ..Hirsch established the Imperial Turkish Railway Company in Paris, where he lived, and he hired Wilhelm von Pressel, an engineer from Stuttgart."²²³

In 1889, the concession agreement of the Haydarpaşa-Izmit-Ankara railway was signed. The agreement was on the subject of the privilege of the construction and operation of the Anatolian railways, the operation of the Haydarpaşa-Izmit railway, and the extension of the Haydarpaşa-Izmit line to Ankara. The concessions were given to Deutsche Bank-Württembergische Vereinsbank for ninety-nine years.²²⁴

There is something that gathered my attention during my research in the Ottoman Archives; I came across a correspondence document, dated 1887, about the concession rights Haydarpaşa-Izmit-Ankara railway project. The document states that the mutual agreement on concession rights of construction and operation for the Haydarpaşa-Izmit-Ankara railway project had been reached. The interesting part here is that the concessionaire is not the Deutsche Bank-Württembergische Vereinsbank in the 1889 agreement, but Monsieur Collas and Monsieur Donon. The document states that if Monsieur Collas and Monsieur Donon accepted the negotiated conditions, the concession agreement could be signed.²²⁵ This correspondence document is dated January 25, 1887. Given the date of the correspondence and the concession agreement, Bernard Collas was interested in the construction of the Haydarpaşa-Izmit-Ankara railway project, and his proposal was considered. The critical point here is the interconnectedness of diverse infrastructural elements and their prospects as valued investment opportunities. Collas, who already has the lighthouse building

²²³ Christensen, *Germany and the Ottoman Railways: Art, Empire, and Infrastructure*, 12.

²²⁴ Albayrak, "Osmanlı-Alman İlişkilerinin Gelişimi Ve Bağdat Demiryolu'nun Yapımı."1–38.

²²⁵ COA, HR.İD.2011-31 and HR.İD.2011-32

and operation privileges, sought additional construction and operation privileges of infrastructure projects.

5.3.2 The Jaffa-Jerusalem Railroad

The significant movement of pilgrims arriving in Jaffa to visit the Holy Places suggested the idea of a modern means of transportation between the port of Jerusalem. One of the most evident changes regarding steamship was the tremendous growth in the number of traveling Muslims doing the hajj, notably those coming from India and the Malay Archipelago. Nile Green articulates this issue "unlikely that such steamboat pioneers as Thomas Dundas and Robert Fulton imagined that their inventions would enable more Muslims to make the hajj than had gone in the previous twelve centuries, but this is precisely what took place."²²⁶ The reasoning of the Jaffa- Jerusalem railroad stands in a slightly different point since it does not directly facilitate the maritime trade. As one of the outcomes of steamship technology, Hajj travel shifted from land to sea. This shift in movement resulted in a growth in cities such as Alexandria, Port Sudan, Aden, Jeddah, and Jaffa.²²⁷ According to Searight, the railways built in the Empire until the 1880s were considered as fragments of railroads aiming to connect the Ottoman Empire's coastal fringe and inner lands.²²⁸ For instance, the Izmir railway, which is eighty miles long with the islands of the Menderes valley, was extended in 1888, and another small railroad line connecting Mersin and Adana was inaugurated in 1883. Both of the

²²⁶ Further on the issue of :haji travelers in the steamship era and later : Mary Byrne McDonnell, "Patterns of Muslim Pilgrimage from Malaysia, 1885–1985," in *Muslim Travellers: Pilgrimage, Migration, and the Religious Imagination*, ed. Dale F. Eickelman and James Piscatori (Berkeley: University of California Press, 1990), 111–30; F. E. Peters, *The Hajj: The Muslim Pilgrimage to Mecca and the Holy Places* (Princeton, NJ: Princeton University Press, 1994), 266–315

²²⁷ Barak, *Powering Empire*, 24–53.

²²⁸ Searight, *Steaming East*, 237.

railroad lines aimed to connect the inland to ports and coastal areas. I find Searight's argument stating that the Jaffa and Jerusalem railway line was part of the railway fragments providing connections from the shores compelling.²²⁹ Furthermore, Christensen elaborates on this issue with respect to the Suez Canal:

... construction of the connection at Iskenderun reinvigorated much of the trade and livelihood that had been lost decades earlier with the construction of the Suez Canal. As a result, the urban growth that ensued was primarily industrial and occurred around the station and along a corridor nestled between the railway and the Mediterranean waterfront.²³⁰

In 1888, Youssouf Navon Efendi obtained a seventy-one-year concession for the Jaffa and Jerusalem railway line. Despite this, he did not own the finances for this project. Therefore, Youssouf Navon Efendi convinced Bernard Collas to provide financial support. On December 29, 1889, Société du Chemin de Fer Ottoman de Jaffa à Jerusalem (Ottoman Railway Company from Jaffa to Jerusalem) was established in Paris, with Collas as the first president. In the same year, the concession of the Jaffa Jerusalem railroad was transferred to Société du Chemin de Fer Ottoman de Jaffa à Jérusalem (Ottoman Railway Company from Jaffa to Jerusalem).²³¹ In the Hamidian Visual Archives, on a photograph titled Chemin de Fer de Jaffa à Jerusalem, dated 1892,²³² Collas is listed as the president of the Ottoman Railway Company from Jaffa to Jerusalem. Hayrettin Bey is listed as General Director. Celal Pasha (Aide de Camp of the Sultan) and Ibrahim Pasha (Governor of Palestine) are also in the photograph. The names of other people in the photograph are also listed, but their relationship is not stated. Geyikdağı elaborates on the continuation of the Jaffa and Jerusalem railway line as such: "A Swiss

²²⁹ Searight, *Steaming East*, 237.

²³⁰ Christensen, *Germany and the Ottoman Railways: Art, Empire, and Infrastructure* 148.

²³¹ Geyikdağı, "French Direct Investments in the Ottoman Empire before World War I," 525-561.

²³² Istanbul University Rare Works Collection (Hamidian Visual Archives), 90400-0019.

subcontractor firm completed the 87-km line in 1892, and an Ottoman Greek subject had directed its technical department. Sadly, due to construction errors, the line was closed in 1894. Later, even though the problems were not eliminated, its operations began under new management".²³³



Figure 12 Chemin de fer de Jaffa a Jerusalem²³⁴

I want to point out the similarity between the concession process of lighthouses and other infrastructure types. Much like lighthouses, railroads, by connecting shores to the inner lands, aim to cater to frequent maritime traffic. The quays also have the same purpose, enabling steamships to approach coasts. On the other hand, as I have stated at the beginning of this chapter, each type of infrastructure has its own level of complexity. Keeping Marius Michel's career as the

²³³ Geyikdağı, "French Direct Investments in the Ottoman Empire before World War I," 525-561.

²³⁴ Istanbul University Rare Works Collection (Hamidian Visual Archives) , 90400-0019

lens upon this complex system, I have examined the lighthouse and quay differences due to the existence of a historic functioning structure before the construction and proximity to the settlement. The various types of infrastructure projects to facilitate the increased naval traffic developed through technological innovations during the nineteenth century. Moreover, as indicated by the Haydarpaşa project, which included the quay and railroad constructions, these infrastructures were closely interlinked. This connection among the different types of infrastructure projects becomes evident because the same concessionaires invested in these varied infrastructure projects. The following section will cover the analysis of the lighthouse construction in a similar manner to the previous chapter via the profit tables of Collas and Michel Company, the maps provided from the On Barak's Powering Empire, and the table demonstrates the distribution of lighthouse fees paid during 1874-1883 according to the country.

5.4 The 1870-1890 Period Regarding Lighthouses

In this section, I focus on activities related to lighthouse construction and utilization. This period is different from the first one I discussed in the previous chapter. The difference pertains to improvements in steam engine technology, causing an increase in the regularity of steamship travel. Besides this, the base network of lighthouses is established. To put it in another way, 90 lighthouses, were ordered in the 1860 concession agreement, and 22 lighthouses before 112 lighthouses were already constructed. Since construction was the most significant expenditure item, it affected the expenditure costs. Many lighthouses had already been installed and undergone expansion in this period as a foundation of the lighthouse network. Therefore, the lighthouses built during the period between the first two lighthouse concession

agreements (1860-1879) established the base of the lighthouse web. It is essential to add that the Suez Canal construction had a major impact on the overall maritime activity. Considering the importance of the Suez Canal, in this section, I will begin with the lighthouse construction in the Red Sea and continue with the lighthouse construction and operation activity on other shores to finalize with a general assessment.

5.4.1 Lighthouse Construction in the Red Sea

The opening of the Suez Canal was a turning point for global maritime transportation. The lighting of the Red Sea shore was directly correlated but not limited to the inauguration of the Suez Canal. As part of the coal corridor stretching from London to Bombay, the Red Sea was a focal zone since the beginning of the nineteenth century. In addition to this corridor, the environmental structure of the Red Sea, including many reefs, makes the area risky for navigation. Consequently, the navigational safety of the Red Sea had remained a topic for a long time. The cartographical work regarding the site during the 1830s is an illustration of the major safety concern.²³⁵ On the issue of lighthouse construction activity before the inauguration of the Suez Canal, Thobie remarks, "as early as 1856, the Egyptian government gradually established in the northern part of the Red Sea six lighthouses - Newport (Suez Bay) in 1856, Zafazana and Ashrafi in 1862, Doedalus in 1863, Raz-Garit in 1872-- but the lighting remains insufficient, and [the number of] shipwrecks multiply."²³⁶

²³⁵ Wick, Alexis. *The Red Sea*, 133-141.

²³⁶ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 43. translated by the author the original quote : « Dès 1856, le gouvernement égyptien a progressivement fait établir dans la » partie septentrionale de la mer Rouge six phares —

The shipping companies demanded a solution to the insufficient lighting problem from the Ottoman Imperial Admiralty after the inauguration of the Suez Canal in 1869. In 1875, as a response to this demand, the Imperial Admiralty commissioned Collas and Michel to conduct research on the illumination of a few reefs and the coastline of Hijaz, Yemen, the Persian Gulf. Alongside this, another proposal emerged. William Allet created a map of future light locations: Edouard Hid provided the entire project. The Tophane commission chose the Collas and Michel project on February 28, 1881. On 12/14 April 1881, the contract, which covered forty years, related to the construction of thirty lighthouses and lights in four phases. These phases are planned to render from the regions. The first phase regions are Hijaz and Yemen coasts, and the second phase region group is named international navigation, the third phase constitutes the Persian Gulf coast, and the last phase covers the southeast Arabian coast. The revenues were shared between the concessionaires and the State, similar to the contracts of 1860 and 1879. The lighthouse fees belonging to the first phase would be shared as 78% to the concessionaires, the rest to State; for the lighthouses' fees of the second phase after August 1884, the share of the concessionaires was decreased to 72%.²³⁷

5.4.2 Lighthouse Construction in Between the Second and Third Concession Agreements

As stated earlier in this study, the main priority of the Collas and Michel Company was the illumination of the Red Sea after the opening of the Suez Canal. In addition

Newport (rade de Suez) en 1856, Zafazana et Ashrafi en 1862, Doedalus en 1863, Raz-Garit en 1872,—
— mais l'éclairage reste insuffisant et les naufrages se multiplient. »

²³⁷ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 43-51

to the lighthouse construction in the Red Sea, I will discuss the lighthouse construction activity on other shores. To this end, I will utilize an *ilaname* document dated November 1879. This *ilaname* document contains notices of three groups of lighthouses stipulations for the second concession agreement signed July in the same year 1879. The first group was to be illuminated on November 30, 1879. The second group was listed as "lighthouses to be illuminated soon but later than November 30, 1879", and the last group of lighthouses was the ones with ongoing construction. The first group includes Kefken Burnu Lighthouse, Amasra Lighthouse, and Trabzon Lighthouse, which belonged to the Black Sea Line; Macaronia Lighthouse belonged to Mytilini Canal Line, and Çeşme Lighthouse belonged to the Chios Canal Line. The lighthouses to be illuminated soon were from the Black Sea Line (Bafra Burnu, Çivi Burnu, and Vona Burnu) and the Mediterranean Line (Gulf of Thessaloniki, Bodrum, Castellorizo, and Dedeagaç). The last line contains lighthouses from the Black Sea Line (Emoneh Burnu) and Mediterranean Line (Alanya, Aghios Ionnis Cape, Sidero Cape, Gavdo Island, Tripoli, Benghazi, and Derna), and additionally contains the Samana Point Lighthouse in the Ataurique Line. Although the emphasis on the works of Collas and Michel company was the illumination of the Red Sea from 1879 to 1894, the other lines of the lighthouse network were also expanding.

5.4.3 General Evaluation of the Construction and Use of the Lighthouses Between 1870-1890

In this part, I will demonstrate the increase in lighthouse use and production with the help of the revenue tables and maps in the 1870-1890 period. The charts derived from the revenue tables Thobie created in his work were based on the accounting books of the General Administration of Lighthouses and news accounts in the

Journal de Paris.²³⁸ The maps are also informed by the 1870-90 maps provided by On Barak in *Powering Empire*. This period was marked with the opening of the Suez Canal in 1869 and the extension of the regularized use of the steamship. This periodization considers steam engine technology together with the Suez Canal project. Steam engine technology reduced the size of the vessel engines, enabling more room for a considerable amount of cargoes.²³⁹ In addition, at this point, the propeller engine could be installed on the already built sail ships. As a result, steamship numbers increased with the possibility of converting sail ships to steamships with engine installation.²⁴⁰

In the maps (figure 13), the increase in lighthouse construction is demonstrated on a global scale. The significant increase in the number of lighthouses along the Suez Canal is noticeable on the map. Since the Suez Canal was part of the coal corridor stretching from London to Bombay, the Red Sea had been a focus since the beginning of the nineteenth century. Correspondingly, England had the highest percentage of the ships which had paid lighthouse fees Ottoman State and Collas and Michel collect, with nearly 40% of all payments paid for lighthouse fees, evident in the table of lighthouse fees distribution by country between the years 1874-1883. They were followed by Ottoman, Austro-Hungarian, Greek, Italian, and Russian ships, which paid lighthouse fees; French ships come in seventh place, with 6.4% of the total. 96% of Ottoman lighthouse earnings came from seven countries, including the Ottoman Empire itself. Still, there were sixteen other countries in the list of paid lighthouse fees distribution in 1874-1883 by country. This variety illustrates the increasing scale and globalized reach of maritime trade activity.

²³⁸ To be more exact the documents were Administration Generale des Phares, Grand Livre, Constantinople, Volumes A to N period 1861-1940 *Journal de Paris*, Volumes A to I, for the period 1860 1959. These documents Thobie had been authorized to consult, in 1970, by Mr. Guy des Closières, when the archives of the Collas and Michel Company were located at 15 rue La Pérouse in Paris, were not transmitted to the National Archives of Aix-en-Provence. Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 77.

²³⁹ Barak, *Powering Empire*, 123.

²⁴⁰ Rippon, *Evolution of Engineering in the Royal Navy*, 89.



Figure 13 Mediterranean and Indian Ocean Lighthouses in 1870 and 1890. The author added black Sea Lighthouses ²⁴¹

Together with steamship technology, all corners of the world became accessible for frequent travel. Here I include the Black Sea portion of the 1890 map. To this end, I used the hydrographic map, including all types of physical features and the lighthouses of the Black Seadone in 1897 by Captain Muhittin Efendi. It was

²⁴¹ Barak, *Powering Empire*, 131-132.

published by the Naval Map Drawing Office (Bahriye Harita Resimhanesi) and is now located in the Ottoman Archives.²⁴² The increase of lighthouse construction activity in the Black Sea line and Charmanie and Syria Line is striking in the maps, likewise the lighthouse construction activity in the Red Sea.

Table 3 Distribution of lighthouse fees for 1874-1883 by country²⁴³

Rank	Country of Ships	% in total tonnage	Lighthouse fees paid from 1874 to 1883 Agio deducted 8.5% in LT	Lighthouse fees paid from 1874 to 1883 without agio 8.5% in FF	% in Lighthouse fees
1	English	39,634	399.998	8.999.963	39,6
2	Ottoman	12,376	124.874	2.809.677	12,4
3	Austrian-Hungarian	11,014	111.131	2.500.469	11
4	Greek	10,874	109.709	2.468.458	10,9
5	Italian	9.265	93.484	2.103.390	9,2
6	Russian	6,856	69.177	1.556.487	6,8
7	French	6,438	64.959	1.461.590	6,4
8	Swedish-Norwegian	1,098	11.079	249.277	1,1
9	Belgian	0,982	9.908	222.939	1
10	German	0,832	8.395	182.885	0,8
11	Dutch	0,338	3.410	76.724	
12	Danish	0,240	2.421	54.487	
13	American	0,028	282	6.356	
14	Spanish	0,022	222	4.994	
15	Portuguese	0,002	20	454	
16	Uruguayan	0,002	20	454	
	Total	100	1.009.091	22.707.574	
	Annual average		100.909	2.270 757	

The increase in lighthouse construction activity reflected directly on the revenues.

The increase in the lighthouse numbers meant the firm could collect more fees from steamships in more ports. In contrast to their earnings, their most significant expenditure was the construction costs for the Collas and Michel Company. This

²⁴² COA, HRT.h.710- also could be seen at appendix D

²⁴³ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 79.

expenditure linked with the substantial increase in the lighthouse building activity could be traced to the completion which concession agreements orders. Therefore, in the years following the concession agreements, those lighthouse constructions experienced a boost. In the table below, the periods of 1862-1868, 1879-1883, and 1894-1898 were the periods with the lowest percentage of total profit and revenue ratio. Provided the costs of the lighthouse network formation, the return is still remarkable. On top of that, after the first concession, a foundation of the lighthouse network was established. The revenues were rising while the lighthouse network expanded.

The general trend of the profitability of the Ottoman Lighthouses was increasing. This increase is correlated with the regularized and enhanced steamship traffic due to the improvements in steam engine technology. The investments of the lighthouse concessionaries Michel Pasha and Bernard Collas are linked to facilitating the increased steamship transportation flow and expanding the network of infrastructures. Another critical point regarding the profits was visible in the second renewal of the 1860 concession agreement or the third lighthouse concession agreement in 1894. During the negotiations for the third lighthouse concession agreement, the financial liberty of the concessionaries and the risks Michel Pasha and Bernard Collas took to acquire the concessions again proves the profitability of the Ottoman lighthouses.

Table 4 The profits of Collas and Michel Company (% Five-year periods)²⁴⁴

Five-year Periods	As a percentage of total revenue	As a percentage of total benefits	The relative share of concessionaires in revenues. (profitability) % of revenue
1862-1868	41,3	65,9	52,6
1869-1873	48,4	68,8	62,1
1874-1878	39,9	62,8	46,4
1879-1883	33,6	59,6	43,2
1884-1888	36,8	53,9	54,2
1889-1893	43,1	54,2	67,3
1894-1898	39,4	51	63,7
1899-1903	21,7	24,2	46,2
1904-1908	38,2	38,2	61,8
1909-1913	37,2	45,1	67,9
1862-1913	36,07	49,36	56,41

5.5 The Third Concession Agreement in 1894

The company's terrific financial results led the directors-general Collas and Michel to negotiate a third concession agreement for the lighthouses starting from 1893. The third concession agreement was the renewal of the 1879 agreement or the second concession for lighthouses, which was the modified version of the first concession agreement signed in 1860. The concession agreement of 1879 gave to the Collas and Michel Company the construction and operation privileges of the lighthouses, which extended the existing concession until 1899. In 1893, bankers and business people from Constantinople applied to be candidates for the lighthouse concession, proposing the Ottoman government a substantial loan to secure their position for the lighthouse concession. The affair of the third concession agreement was promptly carried out despite various alternative proposals from bankers and business people. On October 13/25, 1894, an *irade* granted the extension of the concession of the Lighthouses for 25 years, extending from the previous end year of the second

²⁴⁴ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 83.

concession, which was 1899, to 1924. The negotiation of the third concession agreement went incredibly smoothly. There were two reasons behind this. Firstly, Collas aided the Sultan by publishing a series of pieces in *Journal des Débats* supporting the Ottoman government's policy. Bernard Collas and his son were among the administrators appointed on January 17, 1893, to *Journal des Débats*. This support was precious since it occurred when the Ottoman Empire was violently attacked by the entire European press, particularly for its autocracy and Balkan policy. The second factor that eased the third concession agreement process was related to the substantial financial step down from Collas and Michel. They increased the State's share in the lighthouse fee revenues from 28% to 50%, starting in 1899. The extreme revenues of the business allowed Collas and Michel to take this otherwise risky decision. This decision received a warm response from the Ottoman Government.²⁴⁵

²⁴⁵ Thobie, *L'administration Générale Des Phares de l'Empire Ottoman et La Société Collas et Michel, 1860-1960*, 43-51.

CHAPTER 6

CONCLUSION

This study is concerned with lighthouse construction activity during the second half of the nineteenth century in the Ottoman Empire. To understand the lighthouse building process, I have gone through several contextual layers considering the technological advancements within the nineteenth century, maritime transportation frequency, and establishing an interlinked global infrastructure system containing networks of railroads and ports well as lighthouses to provide connections and navigational support. The first layer is a broad context of steamship technology development and its uses in the nineteenth century. The second layer regards steamship companies, and their services in maritime traffic go on top of the first layer. The second layer resulted from the first layer of steamship technology development during the nineteenth century. The last layer considers the need for infrastructures to facilitate increased maritime traffic navigation and links to connect with the land. As a part of the infrastructure system and navigational safety, the requirement of lighthouses and their construction activity is relevant to these layers. To study the lighthouse building activity within these intertwined contextual layers, I have decided to utilize Marius Michel's life and career. He was behind lighthouse construction activities in the Ottoman Empire during the second half of the nineteenth century and served as a lens to unravel the complicated structure of these layers. His works were the lighthouses in the coastlines of the Ottoman Empire, which provided navigational aid, and quays for the steamships eased their approach to land. The relationship I seek to reveal is a correlation between these infrastructures and the developing steam engine technology. This relationship concerns the

advanced steamship technology, which enables regular and frequent maritime transportation during the nineteenth century. This frequent maritime transportation involves the intensification of the maritime trade in global scale. As a result, increased maritime flow requires infrastructural support. This support includes but is not limited to the quays for steamships to approach to land, railroads to connect the inlands with the ports and lighthouses to provide navigation and coastal safety. For the case of the Ottoman Empire, the relationship with infrastructural development and maritime trade generally concerns the foreign direct investments. The economic impact goes further than just facilitating the maritime trade; it was a part of the integration of the global economy since construction processes included foreign direct investments to the Ottoman Empire. The foreign direct investments aimed to provide the necessary infrastructure for the maritime trade especially after the Baltalimanı Trade Treaty in 1838. I have thought this connection in a similar manner with a contemporary idea of needed telecommunication infrastructures required for the financial transactions. I aimed to display the establishment of the lighthouse web in the nineteenth-century Ottoman Empire and its connections as part and parcel of the global infrastructure network, including railroad and quay networks. While doing so, I also considered that the intertwined global infrastructure network was established to cater to the increase in maritime activities, due to the steam engine technology advancements. In addition, this thesis considers the differences of the discussed global infrastructure network's fragments, which was created by assembly of several types of infrastructure webs with varying degrees of complexity. As I was considering Marius Michel's life and career as the frame of reference, to trace these differences, I focused on the differences between lighthouses and quay structures.

To this end and I have utilized, together with Ottoman State documents, the concession contracts of the lighthouse building and operation and *ilaname* documents which are the records that depict lighthouses' establishment dates. In addition, I used the profitability tables of *Société Collas et Michel*, the company holding the concession rights for the lighthouses in the Ottoman Empire, and maps locating the lighthouses in the shores of the Adriatic Mediterranean and the Indian Ocean, Red and the Black Sea. In addition to these sources, I have used concession agreements of other infrastructure projects within the scope of this thesis, funded by the partners of *Société Collas et Michel* and two books, *Lighthouse Construction and Illumination*, written by Thomas Stevenson in 1881, and *The Story of Our Lighthouses and Lightships: Descriptive and Historical* written by W. H. Davenport in 1891 about the lighthouse construction.

After providing extensive background on maritime travel speed enabled by the development of steamship and lighthouse technology before and during the nineteenth century; I focused on the Marius Michel's career starting from the year 1855 when he became the General Administrator of Ottoman Lighthouses, to the year of the final concession agreement he signed with the Ottoman state regarding the lighthouse construction in 1894. The second chapter, regarding the broad contextual background, has an extensive time frame, including all of the developments throughout the century, while the other three branches are organized chronologically. Chapters three to five ended with the signature of the lighthouse building and management concession contract. The third chapter ends with the first lighthouse concession agreement signed between the Collas and Michel Company and the Ottoman State in 1860. The fourth chapter covers the process until the signature of the second lighthouse concession agreement (a renewal contract) in

1879, and the last chapter ends with the third concession agreement (a renewal contract). While I narrated this process linearly, I have included other infrastructure projects such as the Suez Canal, Galata Quay, and Jaffa- Jerusalem Railroad, and the relation of these projects with lighthouse construction activity managed by Collas and Michel Company. In addition, in the fourth and fifth chapters, I included an analysis of lighthouse construction, including the profit tables of Collas and Michel Company and the Map of Lighthouses during 1850, 1870, and 1890 covering shores of the Adriatic Mediterranean, the Indian Ocean, the Red Sea and the Black Sea. Meanwhile, these complex processes are traced from Marius Michel's career path and his direct investments in the Ottoman Empire as a part of an intertwined global infrastructure network of ports, canals, telegraph lines, railroads, etc. in order to facilitate the intensified trade, and maritime activity increased in the nineteenth century.

I claim that lighthouse construction is directly correlated with the advancement of steamship technology. Furthermore, as integral components of navigational practices, the lighthouse network is an interconnected infrastructure network. That being said, the scope of this thesis has constraints due to the limits of an MA program. Regardless of the variety of sources I have used, the scope of the study could be extended. To begin with, for the *ilanname* documents, I have only included those from the 1861-1879 period. The *ilanname* documents of the lighthouses after 1879 could provide a larger scope.

Furthermore, each line considered in the fourth chapter could be analyzed as cases in which the lighthouse line is discussed and the other investments for infrastructural elements, a sole topic to be examined with in-depth analysis. For

example, the illumination of the Red Sea could have been a topic of another study by itself.

Another issue concerning the possible expansion of the scope of this study, is the emphasis on the steamship companies, which could have been studied with the exact routes and their correlation with the lines of lighthouse construction. The intensified maritime traffic was a fundamental part of this study and the maps of the frequent routes used by the steamship companies and the changes of the preferred routes over time could be very beneficial to understanding the patterns of lighthouse construction.

The lighthouse construction boom was experienced as a part of the great expansion of infrastructures during the nineteenth century. This trend was a global trend and the lighthouse building activities in Indian and Pacific Oceans should be evaluated together with the Ottoman lighthouse construction experience. This would unravel the lighthouse building process in the different geographies.

Marius Michel's life and career were the primary focal points and the lens I have used in this study. A study with an emphasis on the life and career of Bernard Camille Collas, the partner of the Collas and Michel Company, which holds the concession rights for the lighthouses in the Ottoman Shores, could be an interesting extension to this work.

Finally, the quay and railroad projects evaluated with the lighthouse building process were funded by the concessionaires of the lighthouses. This was a purposeful decision to demonstrate in a very concrete manner and highlight the intertwined nature of the global infrastructure projects catering the maritime links with navigational support and structural support connecting inland to the coastal area. However more railway and quay projects could have been discussed together. In

addition, apart from the physical unfractured social and financial infrastructure elements such as trade companies, banking, insurance, and municipal services could expand the perspective of this study substantially as part of the evaluation of the infrastructural advancements supporting the maritime trade. To conclude, this thesis is a preliminary attempt to examine the increasing infrastructure construction in the nineteenth century, when global connections and maritime transport increased through Marius Michel's life and works.

APPENDIX A

TARIFF OF LIGHTHOUSE FEES OF THE OTTOMAN EMPIRE OF 1 SEPTEMBER 1856

— 4 —

TARIF

des Droits de Phares à percevoir sur les lignes de phares

DE L'EMPIRE OTTOMAN

autres que celles dites des Dardanelles à la Mer Noire.

LIGNE de	Quotité en paras par ton. de Turquie de Jauge.	
	De 5 à 800 tonneaux	Par chaque tonn. excédant 800 tonn.
	Paras	paras
Smyrne	15	7 1/2
Mételin	10	5
Chio	10	5
Salonique et Volo	10	5
Samos et Cos	10	5
Rhodes	10	5
Caramanie et Syrie	10	5
Candie	10	5
Tripoli de Barbarie	10	5
Mer Noire) Côte d'Anatoli	10	5
à partir de Kili et)		
Kara-Bouroun.) Côte de Roumeli	10	5
Albanie (Adriatique)	8	4

OBSERVATIONS GÉNÉRALES

Les Droits sont dus toutes les fois que le navire mouille dans un port Ottoman.
Les Droits sont obligatoires à l'arrivée et au départ; les quotités ci-dessus n'expriment que l'une ou l'autre de ces deux catégories.
Les navires au-dessous de 5 Tonneaux sont exempts de Droits.

APPENDIX B

LIGHTHOUSE CONCESSION CONTRACT OF AUGUST 8/20, 1860

T.C. BASBAKANLIK OSMANLI ARSIVI DAİRE BASKANLIĞI (BOA)

Contrat de Concession des Phares du 8/20 Août 1860.-

Par le présent Contrat il est convenu entre le Gouvernement de Sa Majesté Impériale le Sultan, représenté par Son Altesse Mehmed Ali Pacha, Grand Amiral, Ministre de la Marine, décoré du Médjidié et du Nichan-Iftikhar de première classe, décoré d'Autriche, d'Espagne, de Sardaigne, de Perse, de Grèce, de Russie, et autres ordres étrangers, d'une part;

Et M. Collas (Bernard Camille), Chevalier de la Légion d'Honneur, membre de deuxième classe de l'Ordre Impérial de Saint-Stanislas de Russie, présentement à Constantinople, demeurant à Paris;

Et M. Michel (Marius), Directeur Général des Phares de l'Empire Ottoman, membre du Médjidié de quatrième classe, demeurant à Constantinople, d'autre part:

Art.1er. M.M. Collas et Michel s'engagent à compléter le système d'éclairage des côtes de l'Empire Ottoman dans la Méditerranée, les Dardanelles et la Mer Noire, ainsi qu'il est dit à l'annexe (A).

Art.2.- Il y aura une Commission Mixte, composée de sujets Ottomans et Européens choisis parmi des personnes compétentes, et présidée par le Capitan Pacha, ou par un officier délégué par la Sublime Porte. Cette Commission sera investie des attributions qui se trouvent spécifiées dans le présent Contrat, ainsi que de toute attribution que pourrait exiger la surveillance et l'inspection des phares et la régularité du service.

Les Concessionnaires ou leur mandataire seront entendus par la Commission chaque fois qu'ils le jugeront utile aux intérêts du service dont ils sont chargés.

Art.3.- Les travaux de la ligne des Dardanelles à la Mer Noire devront être terminés au plus tard dans un an à partir de la date du présent Contrat.

Les travaux des autres lignes devront être terminés dans un délai de trois ans au plus.

Art.4.- Si la Commission croit utile plus tard d'établir de nouveaux phares, les Concessionnaires auront le privilège de les construire

HR.HMŞ.İSO. 71/2

11

HR.HMŞ.İSO.00071.00002.011

- 2 -

dans les termes ci-dessus précités, en acceptant des conditions raisonnables.

En cas de divergence d'appréciation au sujet de ces conditions, elles seront fixées par des Arbitres choisis par le Gouvernement Ottoman et les Concessionnaires.

Les Arbitres pourront, s'il y a lieu, s'en adjoindre un troisième, qu'ils désigneront eux-mêmes.

Si les deux Arbitres ne peuvent s'entendre sur le choix du troisième, il sera nommé par la Commission Mixte.

Art.5.- Les tours, mâts, bateaux, feux et maisons des gardiens à établir seront élevés ou construits aux frais des Concessionnaires, et leur bon état dûment constaté.

Les terrains nécessaires seront gratuitement prêtés par le Gouvernement Ottoman. Les Autorités des lieux où les phares seront établis auront le droit d'entrer dans les phares toutes les fois que des mesures de police ou d'ordre public pourront exiger leur présence, ces terrains étant considérés comme propriétés Ottomanes.

Les appareils et feux destinés à la ligne des Dardanelles existant actuellement dans les magasins de l'Arsenal seront cédés gratuitement aux Concessionnaires, ainsi que toutes les tours, feux, appareils, outillage, approvisionnements, &c. sans exception aucune, existant actuellement sur les points déjà éclairés.

Art.6.- Les matériaux destinés à la construction ou à la réparation des tours et feux, l'outillage, les approvisionnements nécessaires à l'éclairage, enfin tous les objets qui seront nécessaires à l'Administration des Phares seront exempts des droits de douane pendant la durée du présent Contrat sur tous les points de l'Empire Ottoman où sont situés les phares qui forment le sujet du présent Contrat.

Les Concessionnaires seront tenus de justifier de l'emploi de ces objets au service des phares, et de prendre toutes les mesures destinées à prévenir les abus de la part de leurs employés. Toutes les Difficultés qui pourront surgir à cet égard seront résolues par la Commission Mixte ci-dessus spécifiée.

HR.HMS.İSO 71/2

12

HR.HMS.İSO.00071.00002.012

- 3 -

Art.7.- A partir du jour de la signature du Contrat, et dès que les Concessionnaires auront été mis en jouissance des phares existants, ils seront chargés à leurs frais de l'éclairage et de l'entretien de tous les feux construits ou à construire pendant la durée de la Concession.

La durée de la Concession sera de vingt ans qui commenceront à courir à partir du jour où les travaux seront terminés sur toutes les lignes.

Art.8.- Les Concessionnaires auront la direction complète des phares, sous la haute inspection du Gouvernement Ottoman et de la Commission Mixte.

La direction des travaux, l'organisation du service et de l'exploitation, le choix du personnel, sa révocation, la quotité des salaires, la répartition des attributions appartiendront exclusivement aux Concessionnaires.

Il est entendu que les Concessionnaires adopteront pour principe d'employer autant que possible des sujets Ottomans afin de les former au service des phares. Il y aura dès le commencement de l'exploitation un certain nombre d'employés qui seront des sujets Ottomans. Toutefois, les sujets Ottomans employés dans les phares ne pourront acquérir la protection étrangère. En outre, tous les employés, quelle que soit leur nationalité, porteront l'uniforme de la marine Ottomane et seront considérés, à l'égard de leur position, sous l'autorité Ottomane, comme les autres étrangers au service public de l'Etat.

Art.9.- En cas de négligence dans le service, dûment constatée, il pourra être infligé aux Concessionnaires une amende de 1000 à 5000 piastres.

Les irrégularités provenant de causes autres que la négligence ne pourront dans aucun cas donner lieu à l'application de cette pénalité.

En cas de négligence des employés chargés de l'éclairage, et en outre de l'amende ci-dessus, des punitions soit personnelles, soit pécuniaires, leur seront infligées selon les Règlements qui seront formulés par la Commission Mixte, qui nommera un tribunal pour juger ces fautes.

Art.10.- Le Gouvernement aura tout droit d'inspection, et pourra avoir à chaque ^{phare} ou il le voudra un Inspecteur. Il nommera un ou deux Inspecteurs Généraux qui auront la faculté de visiter en tous temps les phares,

HR.HMŞ.İŞO - 71/2

13

HR.HMŞ.İŞO.00071.00002.013

- 4 -

afin de s'assurer que le service de l'éclairage est fait d'une façon satisfaisante.

Une partie des fonds que le Gouvernement ^{Ottoman} recevra des Concessionnaires, comme il sera dit ci-après, sera mise en réserve, sous le contrôle de la Commission Mixte, afin que l'inspection ne puisse jamais être entravée faute d'argent.

Art.11.- Les employés munis de contrats appartenant actuellement à la Direction des Phares seront conservés jusqu'à l'expiration de leur engagement. Les appointements de ces employés seront payés par les Concessionnaires jusqu'à l'expiration des Contrats.

Le personnel qui dessert actuellement les phares établis sera laissé à la disposition des Concessionnaires jusqu'à ce qu'ils aient pu le remplacer, afin que le service de l'éclairage ne subisse aucune interruption.

Le traité passé le 1er Août 1855 entre le Gouvernement Ottoman et M. Michel, en vertu duquel il a été nommé Directeur Général des Phares, se trouve annulé en ce qui concerne les obligations que le Gouvernement Ottoman a contractées envers M. Michel.

Art.12.- Bien que les frais d'entretien du matériel soient en totalité à la charge des Concessionnaires, ils ne seront pas responsables des dommages résultant des tremblements de terre, ^{de} c'est-à-dire des cas de force majeure. Ces cas survenant, les réparations seront payées par un prélèvement sur les recettes brutes jusqu'à concurrence de leur entier montant, et avant toute répartition de ces recettes entre le Gouvernement et les Concessionnaires.

Art.13.- Pour rémunérer les Concessionnaires des frais de construction, de l'entretien annuel, des employés et des approvisionnements, enfin de toutes les dépenses du service, il leur sera alloué, à partir du jour de la signature du présent Contrat jusqu'à l'expiration de la Concession, 75 % pour cent des recettes provenant de la perception des droits de phares sur toutes les lignes déjà établies ou à établir.

Art.14.- Sur la ligne des Dardanelles à la Mer Noire les droits seront perçus conformément au tarif arrêté le 1er Septembre 1856.

Sur la ligne du Danube les droits seront perçus conformément au tarif des phares, c'est-à-dire des incidents par indépendance de la nature et des moyens pourvus tels que tremblements de terre, inondations et autres.

HR.HMS.İŞO 71/2

14

HR.HMS.İŞO.00071.00002.014

- 5 -.

tarif actuel, jusqu'à ce qu'un tarif définitif ait été arrêté par la Commission Danubienne.

Sur les lignes à construire les droits seront perçus conformément à l'Annexe (B), et commenceront à être perçus sur chaque point en particulier dès que l'éclairage fonctionnera.

Les cinq grandes Compagnies de l'Arsenal, du Zarb-Hané, des Messageries Impériales, du Lloyd Autrichien, et de la Société Russe de Navigation et de Commerce continueront à Jouir sur toutes les lignes de la remise de 5% qui leur a été accordée dès le principe.

Les navires de guerre seront exonérés du paiement des droits de phares sur tous les points de l'Empire pendant toute la durée de la Concession.

Il est entendu que cette exonération des droits n'est accordée qu'aux navires de guerre proprement dits; elle n'est applicable ni aux Compagnies subventionnées ou privilégiées, ni aux navires de l'Etat qui pourraient être affectés à des services postaux, commerciaux, ou autres de même nature.

Le concours des autorités maritimes sera donné aux Concessionnaires pour protéger et assurer la perception des droits sur les diverses lignes, ainsi que cela se pratique actuellement à Constantinople, à Cavak aux Dardanelles et à Sulina.

La perception des droits de phares sera opérée au nom du Gouvernement Ottoman par les Concessionnaires, sans qu'ils puissent pour cela lui réclamer aucune indemnité.

Art.15.- Le Gouvernement Ottoman mettra gratuitement à leur disposition les locaux déjà affectés au service des phares et à la perception des droits.

Sur les lignes à créer, il prêtera gratuitement aux Concessionnaires les locaux convenables pour les bureaux de la perception à proximité de l'autorité du port et des offices sanitaires.

Le prêt des bureaux sur les lignes à créer ne sera obligatoire que tout autant que les bâtiments existant le permettront. S'il n'y a pas de locaux disponibles, le Gouvernement ne sera pas obligé de les construire. Dans ce cas les frais de construction seront à la charge des concessionnaires.

HR.HMŞİŞÖ 71/2

15

HR.HMŞİŞÖ.00071.00002.015

- 6 -

Les 22% des recettes revenant au Gouvernement lui seront comptés chaque semaine ou chaque mois, à son choix, conformément aux états réguliers de comptabilité qui devront être tenus par l'Administration.

Art.16.- Les Concessionnaires auront le droit de déléguer la direction et l'administration du service à un mandataire spécial résidant à Constantinople.

Art.17.- A l'expiration de la Concession les tours, phares, logements de gardiens, bateaux, mâts, outillage, accessoires, &c., enfin tout le matériel sans exception, en bon état d'entretien, et conformément aux inventaires de la Compagnie, qui seront dûment inspectés à ce sujet, deviendra la propriété du Gouvernement Ottoman, sans que les Concessionnaires puissent réclamer aucune indemnité pour cette remise.

Art.18.- En cas de décès d'un des Concessionnaires leurs héritiers ou ayants droit continueront à exécuter ou à faire exécuter le présent Contrat pendant toute sa durée.

Art.19.- Il est entendu que si le Gouvernement Ottoman croit devoir reprendre le service des phares il aura toujours, et en tout temps, cette faculté, quel que soit le nombre d'années que la Concession aura à courir, sauf une indemnité qui sera arrêtée entre les parties intéressées, et en cas de désaccord, par arbitrage.

Dans les cas autres que celui qui va être spécifié ci-après, les Concessionnaires devront recevoir cette indemnité avant d'être dépossédés de leur Contrat.

En cas de guerre toutefois, soit entre la Porte et une autre Puissance, soit entre^{les} alliés de la Porte Signataires du Traité de Paris, le dit Contrat cessera totalement et de fait, et le paiement de l'indemnité fixée par les parties ou par arbitrage, aussitôt que cela se pourra; n'affectera nullement la cessation du Contrat qui sera immédiate.

Le Gouvernement Ottoman sera alors exclusivement chargé de l'administration des phares, et tenu d'adopter les mesures les plus efficaces afin de sauvegarder sa position comme belligérant ou comme neutre.

La Commission Mixte toutefois sera chargée de surveiller directement la direction des phares et le choix du personnel, ainsi que les recettes

HR.HMS.İŞO - 71/2

16

HR.HMS.İŞO.00071.00002.016

- 7 -

et les dépenses, dont un compte sera exactement rendu.

La Commission prendra aussi ~~à~~ détail un inventaire de tout ce que les Concessionnaires auront laissé, et sauvegardera le tout jusqu'à ce que la paix soit rétablie. Elle sera aussi responsable de toutes les recettes qui resteraient au-dessus des dépenses pendant la guerre./.

Signé : MEHMET ALI

Ministre de la Marine.

Grand Amiral de l'Empire.

Constantinople, le 8 (20) Août 1860.

Approuvé:

(Signé) E.C. Collas.

Approuvé:

(Signé) Michel.

HR.HMS.İSO 71/2

12

17

HR.HMS.İSO.00071.00002.017

APPENDIX C

TRANSLATION OF

LIGHTHOUSE CONCESSION CONTRACT OF AUGUST 8/20, 1860

Lighthouse Concession Contract of August 8/20, 1860

By the present Contract it is agreed between the Government of His Imperial Majesty the Sultan, represented by His Highness Mehmed Ali Pasha, Grand Admiral, Minister of the Navy, decorated with the Medjidié and the Nichan-Iftikhar of the first class, decorated with Austria, Spain, Sardinia, Persia, Greece, Russia, and other foreign orders, on the one hand.

And 1. Collas (Bernard Camille), Knight of the Legion of Honor, member of the second class of the Imperial Order of Saint Stanislas of Russia, presently in Constantinople, residing in Paris; **And 3.** Michel (Marius), Director General of the Lighthouses of the Ottoman Empire, member of the Hedjidié of fourth class, residing in Constantinople, on the other hand:

Art.1er. Mr. M. Collas and Michel undertake to complete the lighting system of the coasts of the Ottoman Empire in the Mediterranean, the Dardanelles and the Black Sea, as stated in the annex (A).

Art.2 - There will be a Mixed Commission, composed of Ottoman and European subjects chosen among competent persons, and presided over by the Kapudan Pasha, or by an officer delegated by the Sublime Porte. This Commission shall be vested with the powers specified in the present Contract, as well as with any other powers that may be required for the supervision and inspection of the lighthouses and the regularity of the service.

The Concessionaires or their representatives shall be heard by the Commission whenever they deem it useful to the interests of the service for which they are responsible.

Art.3. - The works on the line from the Dardanelles to the Black Sea must be completed within one year from the date of the present Contract. The work on the other lines must be completed within a maximum of three years.

Art.4 - If the Commission believes that it would be useful to establish new lighthouses at a later date, the Concessionaires will have the privilege of constructing them under the above-mentioned terms, accepting reasonable conditions. In the event of a difference of opinion as to these conditions, they shall be determined by Arbitrators chosen by the Ottoman Government and the Concessionaires. The Arbitrators may, if necessary, appoint a third Arbitrator, whom they themselves shall designate. If the two arbitrators cannot agree on the choice of the third arbitrator, he shall be appointed by the Joint Commission.

Art.5 - The towers, masts, boats, lights and houses of the guards to be established will be raised or built at the expense of the Concessionaires, and their good condition duly noted. The necessary land will be provided free of charge by the Ottoman Government. The Authorities of the places where the lighthouses will be established will have the right to enter the lighthouses whenever police measures or public order may require their presence, these grounds being considered as Ottoman property. The

equipment and lights destined for the Dardanelles line currently existing in the Arsenal stores will be transferred free of charge to the Concessionaires, as well as all the towers, lights, equipment, tools, supplies, etc., without exception, currently existing on the points already lit.

Art.6 - The materials intended for the construction or the repair of the towers and lights, the tools, the supplies necessary for the lighting, finally all the objects which will be necessary to the Administration of the Lighthouses will be exempt from customs duties during the duration of the present Contract on all the points of the Ottoman Empire where are located the lighthouses which form the subject of the present Contract. The Concessionaires shall be required to justify the use of these objects in the service of the lighthouses, and to take all measures intended to prevent abuses on the part of their employees. Any difficulties that may arise in this regard shall be resolved by the Joint Commission specified above.

Art.7 - From the day of the signing of the contract, and as soon as the Concessionaires have been given the use of the existing lighthouses, they will be responsible, at their own expense, for the lighting and maintenance of all the lights built or to be built during the term of the concession. The duration of the concession will be twenty years, starting from the day when the work is completed on all the lines.

Art.8 - The Concessionaires will have the complete management of the lighthouses, under the high inspection of the Ottoman Government and the Joint Commission.

The direction of the works, the organization of the service and the operation, the choice of personnel, their dismissal, the number of salaries, the distribution of attributions will belong exclusively to the Concessionaires. It is understood that the concessionaires will adopt the following principles to employ as many Ottomans as possible in order to train them for the service of the phases. From the beginning of the operation, there will be a certain number of number of employees who will be Ottoman subjects. However, the Ottoman subjects employed in the lighthouses will not be able to acquire the protection. In addition, all employees, regardless of their nationality, shall wear the uniform of the Ottoman Navy and shall be considered, with respect to their position, under Ottoman authority, as other foreigners in the published service of the service of the State.

Art. 9 - In case of negligence in the service, duly noted, it be inflicted to the Concessionaires a fine of 1000 to 5000 piastres. Irregularities arising from causes other than negligence shall not in any case give rise to the application of this penalty. In case of negligence of the employees in charge of the lighting, and in addition to the above-mentioned fine, punishments, either personal or pecuniary, will be inflicted on them according to the regulations that will be formulated by the Mixed Commission, which will appoint a tribunal to judge these faults.

Art. 10 - The Government will have the right of inspection and will be able to have an Inspector whenever it wishes. It will name one or two General Inspectors who will have the faculty to visit at all times the lighthouses, in order to ensure that the service of lighting is done in a satisfactory way. A part of the funds that the Government will receive from the Concessionaires, as will be said hereafter, will be put in reserve, under the control of the Joint Commission, so that the inspection can never be hindered for lack of money.

Art. 11 - The employees with contracts currently belonging to the Direction of the Lighthouses will be kept until the expiration of their commitment. The salaries of these employees will be paid by the concessionaires until the expiration of the contracts. The personnel currently serving the established lighthouses will be left at the disposal of the concessionaires until they have been able to replace them, so that the service of the lighting will not be interrupted. The treaty signed on August 1, 1855 between the Ottoman Government and Mr. Michel, by virtue of which he was appointed Director General of Lighthouses, is cancelled as regards the obligations that the Ottoman Government has contracted with Mr. Michel

Art.12 - Although the costs of the maintenance of the equipment are entirely at the expense of the Concessionaires, they will not be responsible for damages resulting from earthquakes, i.e. cases of force majeure. In such cases, repairs will be paid for by a levy on the gross receipts up to the full amount thereof, and before any division of such receipts between the Government and the concessionaires.

Art. 13 - To remunerate the Concessionaires for the costs of construction, annual maintenance, employees and supplies, and finally for all the expenses of the service, they shall be allocated, from the day of the signing of the present contract until the expiration of the Concession, 78 percent of the revenue from the collection of lighthouse dues on all the lines already established or to be established.

Art. 14 - On the line from the Dardanelles to the Black Sea, the fees will be collected in accordance with the tariff adopted on September 1, 1856. On the Danube line the dues will be collected in accordance with the present tariff, until a definitive tariff has been established by the Danubian Commission. On lines to be constructed, tolls shall be collected in accordance with Schedule (B), and shall begin to be collected on each particular point as soon as the lighting is operational. The five major companies of the Arsenal, the Zarb-Hané, the Imperial Messengers, the Austrian Lloyd, and the Russian Navigation and Trading Company will continue to enjoy on all lines the 5% discount which has been granted to them in principle. Warships shall be exempt from the payment of lighthouse dues on all points of the Empire during the whole duration of the Concession. It is understood that this exemption from duties is granted only to warships proper; it is not applicable either to subsidized or privileged companies, or to State vessels which may be assigned to postal, commercial or other services of the same nature. The assistance of the maritime authorities will be given to the Concessionaires to protect and ensure the collection of the rights on the various lines, as it is currently practiced in Constantinople, in Cavak in the Dardanelles and in Sulina. The collection of lighthouse dues will be carried out on behalf of the Ottoman Government by the concessionaires the Ottoman Government by the concessionaires, without them being able to claim any to claim any indemnity from it.

Art.15. - The Ottoman Government shall place at their disposal free of charge the premises already allocated to the lighthouse service and to the collection of dues. On the lines to be created, it will lend to the Concessionaires, free of charge, suitable premises for collection offices near the port authority and the sanitary offices. The loan of offices on the lines to be created will be obligatory only to the extent that the existing buildings permit. If there is no space available, the Government will not be obliged to build it. In this case the construction costs will be borne by the concessionaires.

Art.17 - At the expiration of the Concession, the towers, lighthouses At the expiration of the Concession, the towers, lighthouses, lodgings of the guards, boats, mits,

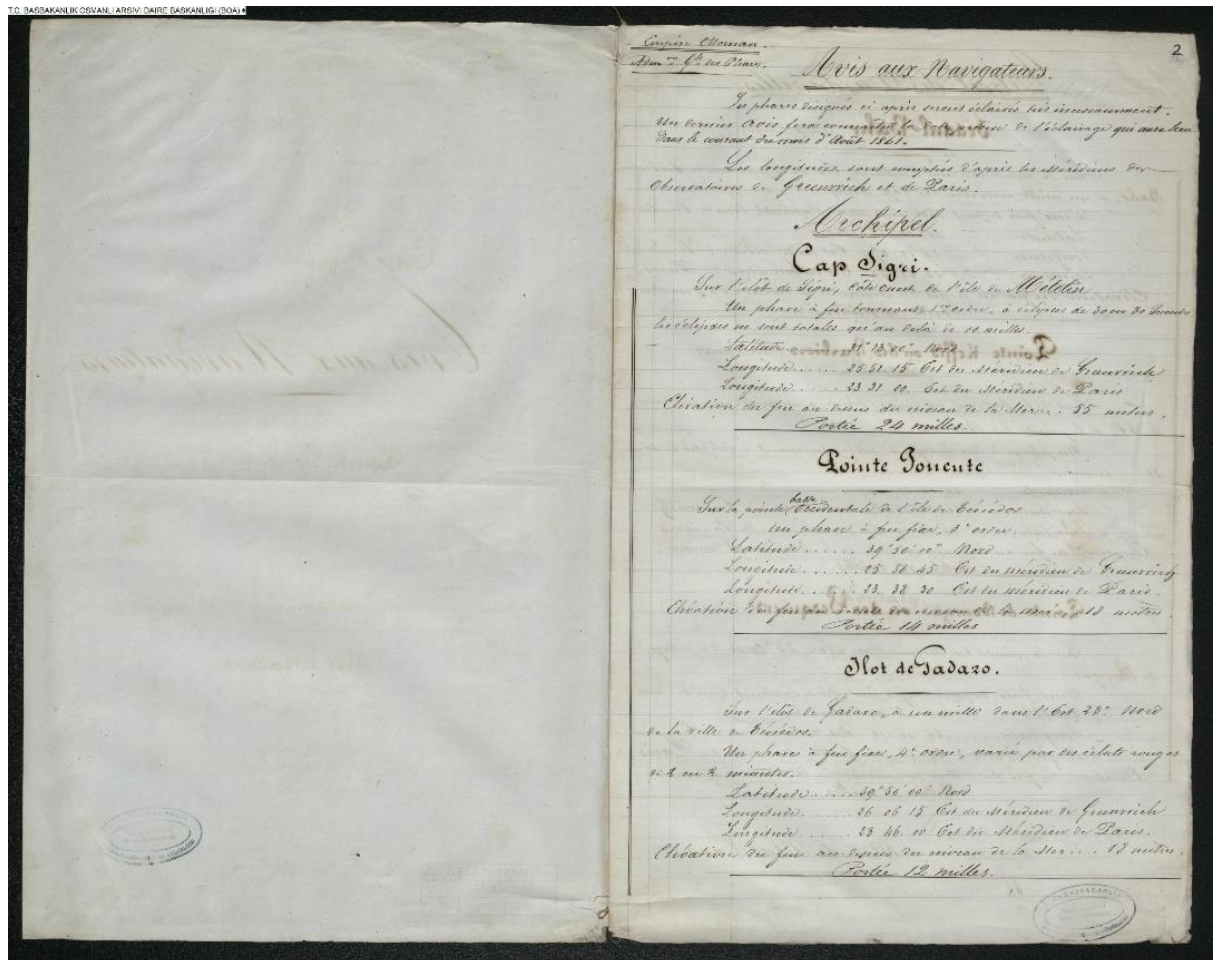
equipment, accessories, &c., in short, all the equipment without exception, in a good state of maintenance, and in accordance with the inventories of the Company, which will be properly inspected in this regard, will become the property of the Ottoman Government, without the Concessionaires being able to claim any compensation for this handover.

Art.18. In the event of the death of one of the Concessionaires, their heirs or assigns shall continue to execute the present Agreement during its entire duration.

Art.19. It is understood that if the Ottoman Government believes that it must take over the service of the lighthouses, it will always have this option, whatever the number of years that the Concession will have to run, except for an indemnity which will be decided between the interested parties, and in case of disagreement, by arbitration. In cases other than the one specified below, the Licensees must receive this indemnity before withdrawing from their Contract. In case of war, however, either between the Porte and another Power, or between allies of the Porte, signatories of the Treaty of Paris, the said Contract shall cease in full and in fact, and the payment of the indemnity fixed by the parties or by arbitration, as soon as this is not possible, shall in no way affect the cessation of the contract, which shall be immediate. The Ottoman Government was then exclusively responsible for the administration of the lighthouses, and was obliged to adopt the most effective measures to safeguard its position as a belligerent or as a neutral. The Joint Commission, however, will be responsible for directly supervising the management of the lighthouses and the selection of personnel, as well as the recot and expenses, of which an exact account will be given. The Commission will also take a detailed inventory of all that the Concessionaires have left, and will safeguard it all until peace is restored. It will also be responsible for any revenues that remain above expenses during the war.

APPENDIX D

İLANNAME DOCUMENTS FROM 1861-1879 PERIOD



HR.ID.00916.00001.002

Seaddul-Bahr (Cote d'Afrique).

Pointe Keffid ou des Barbiers (côte N. E.)

Pointe de Bourgas ou des Pesquiers (Cote d'azur).

Mer de Marmara.

Cap Kora. (côte d'Europe).

Heraclee (ville de Maronisme, Côte d'Ivoire)

Koutaly.

Sainte Valérie (cote d'azur).

Pointe Balaio (Cabo d'Anjo).

Posphere.

Bilou de Sultan Serail (voir d'Europe).

Kandili (cote d'azur)

Roumelie - Missar (Cote d'Europe).



Kanlidja (Cote d'Ivoire)

Dëni-Kenü (côte d'Europe).

Therapia (Cote d'Europe).

Ounmour-Bank (ounmour-jezi) ou Banc des Anglais.

Cavak-fort, Pointe Jéron (côte d'azur).

HR.ID.00916.00001.002

ADMINISTRATION GÉNÉRALE DES PHARES

D E

L'EMPIRE OTTOMAN.

AVIS AUX NAVIGATEURS.

Les Navigateurs sont prévenus que les Phares ci-après désignés, seront allumés le 1^{er} octobre 1863. (N. S.)
Les Longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.
Les Aires de vent sont rapportées au méridien vrai de chaque lieu.

Ligne de Mételin.

CAP SIVRIDJI (Canal de Métélin.)

Sur la pointe de Sivridji, à l'Est de la baie de ce nom. (côte d'Asie.)
Un feu fixe, blanc.
Latitude $39^{\circ} 27' 30''$ Nord
Longitude $26^{\circ} 15' 10''$ E. mérid. de Greenwich.
" $23^{\circ} 54' 55''$ E. mérid. de Paris.
Élévation du feu au dessus du niveau de la mer, 20 mètres. Portée 5 milles.

CAP SKAMIA.

Sur le cap Skamia, côte Nord de l'île de Mételin.
Un feu fixe, rouge.
Latitude $39^{\circ} 23' 00''$ Nord.
Longitude $26^{\circ} 21' 30''$ E. mérid. de Greenwich.
" $24^{\circ} 01' 15''$ E. mérid. de Paris.
Élévation du feu au-dessus du niveau de la mer, 20 mètres. Portée 5 milles.

ÎLE D'ÉLÉOS.

Sur le sommet de l'île d'Éléos, située dans le S. O. des îles de Maskos.
Un feu fixe et blanc.
Latitude $39^{\circ} 18' 40''$ Nord.
Longitude $26^{\circ} 33' 00''$ E. mérid. de Greenwich.
" $24^{\circ} 12' 45''$ E. mérid. de Paris.
Élévation au-dessus du niveau de la mer, 60 mètres. Portée 12 milles.

POINTE DE MÉTELIN.

Sur la pointe de Mételin et au-dessous de la forteresse de la ville.
Un feu de port rouge.
Latitude $39^{\circ} 06' 10''$ Nord.
Longitude $26^{\circ} 34' 50''$ E. mérid. de Greenwich.
" $24^{\circ} 14' 35''$ E. mérid. de Paris.
Élévation du feu au-dessus du niveau de la mer, 30 mètres. Portée 5 milles.

PORT DE MÉTELIN.

Sur les 2 tourelles signalant la largeur de l'entrée du port de Mételin.
Un feu de port rouge sur chaque tourelle.
Latitude $39^{\circ} 05' 56''$ Nord.
Longitude $26^{\circ} 34' 45''$ E. mérid. de Greenwich.
" $24^{\circ} 14' 30''$ E. mérid. de Paris.
Élévation des 2 feux au-dessus du niveau de la mer, 7 mètres. Portée 4 milles.
Nota. — Les 2 feux blancs de port qui existent actuellement seront éteints le jour de l'allumage des deux feux rouges.

Ligne de Smyrne.

CAP MERMINDJI (Entrée du golfe de Smyrne.)

Sur le sommet du cap Mermindji à 250 mètres environ de l'extrémité de ce cap et au N. N. O. de la baie d'Aggria.
Un phare, feu fixe de 2^{me} ordre.
Blanc du N.-E. 1. 2. N. à l'Ouest.
Rouge de l'Ouest au S. S. E.
Un feu triangulaire vert éclairant $33^{\circ} 45'$ est placé dans une embrasure de la tour pratiquée au-dessous du grand appareil. Ce feu signalera les alentours du banc de roches de Mirmindji.
Latitude $38^{\circ} 37' 00''$ Nord.
Longitude $26^{\circ} 46' 20''$ E. mérid. de Greenwich.
" $24^{\circ} 25' 45''$ E. mérid. de Paris.
Élévation du grand feu au-dessus du niveau de la mer, 70 mètres. Portée, 20 milles.

BANC DIT DE L'HERMUS, DE KEDEK, OU DU PÉLICAN.
Sur un navire mouillé par 10 brasses de fond à l'extrémité de ce banc. (Le navire est peint en rouge.)

Deux feux de port verts installés à l'aplomb l'un de l'autre.
Latitude $38^{\circ} 25' 10''$ Nord.
Longitude $26^{\circ} 58' 05''$ E. mérid. de Greenwich.
" $24^{\circ} 37' 50''$ E. mérid. de Paris.
Élévation du feu supérieur au dessus du niveau de la mer, 15 mètres. Portée 4 milles.

BANC DE SANDJAK.

Sur un navire mouillé par 6 brasses à l'extrémité du banc en face du château dit d'Yéni-Kalé ou de Sandjak Kalessi (Le navire est peint en rouge.)
Deux feux de port verts installés à l'aplomb l'un de l'autre.
Latitude $38^{\circ} 25' 15''$ Nord.
Longitude $27^{\circ} 02' 06''$ E. mérid. de Greenwich.
" $24^{\circ} 41' 51''$ E. " de Paris.
Élévation du feu supérieur au-dessus du niveau de la mer 15 mètres. Portée 4 milles.

Ligne de Selo ou Chio

ÎLE SPALMADORE, PACHA ET VATOU (Canal d'Egry-Liman et Entrée du canal de Chio.)

Sur l'Îlot de Pacha à 260 mètres de distance de l'extrémité de la pointe la plus Est de cette île, à droite en entrant dans le port de Pacha. Cette pointe étant malsaine, l'écartier d'une bonne en-cablure.
Un phare feu de 1^{re} ordre tournant de minute en minute
Latitude $38^{\circ} 30' 20''$ Nord.
Longitude $26^{\circ} 18' 40''$ E. mérid. de Greenwich.
" $23^{\circ} 58' 15''$ E. " de Paris.

Élévation du feu au-dessus du niveau de la mer, 75 mètres. Portée 13 milles.

PORT DE SCIO, CHIO OU CASTRO

Sur le château fort bâti sur la tête Nord du môle, à droite en entrant dans le port.
Deux feux de port rouges installés à l'aplomb l'un de l'autre.
Latitude $38^{\circ} 22' 40''$ Nord.
Longitude $26^{\circ} 09' 15''$ E. mérid. de Greenwich.
" $23^{\circ} 49' 00''$ E. " de Paris.
Élévation du feu supérieur au-dessus du niveau de la mer 18 mètres. Portée 4 milles.
Nota. Les 2 feux de port blancs qui existent actuellement l'un sur une tourelle et l'autre sur le château fort seront éteints le jour de l'éclairage des 2 feux rouges.

ÎLOT DE PASPARCOS. (Entrée Sud et du côté de l'île de Chio.)
Sur le sommet de l'Îlot Paspargos pour signaler le passage entre cet îlot et la côte E. de l'île de Chio.

Un phare feu fixe blanc.
Latitude $38^{\circ} 17' 53''$ Nord.
Longitude $26^{\circ} 12' 15''$ E. mérid. de Greenwich.
" $23^{\circ} 52' 10''$ E. " de Paris.
Élévation du feu au-dessus du niveau de la mer 42 mètres. Portée 12 milles.

Ligne de Caramanie et Syrie.

CAP BEYROUTH.

Sur le sommet de la pointe N. O. du cap Beyrouth dite Raz Beyrouth, et à 300 mètres environ de son extrémité.
Un phare feu de 4^{me} ordre tournant de minute en minute.
Latitude $33^{\circ} 50' 10''$ Nord.
Longitude $35^{\circ} 29' 55''$ E. mérid. de Greenwich.
" $33^{\circ} 09' 40''$ E. " de Paris.
Élévation du feu au-dessus du niveau de la mer 30 mètres. Portée 13 milles.

PORT DE BEYROUTH.

Sur la pointe basse du château fort en ruines près de la douane.
Un feu de port rouge.
Latitude $33^{\circ} 49' 40''$ Nord.
Longitude $35^{\circ} 32' 17''$ E. mérid. de Greenwich.
" $33^{\circ} 12' 02''$ E. " de Paris.
Élévation du feu au-dessus du niveau de la mer 18 mètres. Portée 4 milles.
N. B. Les autres feux de la ligne de Caramanie et Syrie seront établis dans le courant de l'année 1864.

OSMANLI ARŞIVI		
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ADMINISTRATION GÉNÉRALE DES PHARES

DE

L'EMPIRE OTTOMAN.

AVIS AUX NAVIGATEURS.

Quelques erreurs de chiffres s'étant glissées dans la publication des AVIS AUX NAVIGATEURS, relatifs à l'éclairage de la Mer-Noire et de la ligne de Caramanie et Syrie, l'Administration croit utile de les redresser comme il suit :

La longitude du feu de GALATA (**ligne de Roumélle Mer-Noire**) a été indiquée: 27° 50' 35" E. Mérid. de Greenwich ;

Il faut lire: 27° 58' 53" E. Mérid. de Greenwich.

L'élévation du feu du CAP BEYROUTH (**ligne de Caramanie et Syrie**) a été indiquée: à 30 mètres au-dessus du niveau de la mer et sa position sur la pointe N. O. du CAP BEYROUTH, dite **Raz Beyrouth**, à 300 mètres environ de l'extrémité de ce Cap ;

Il faut lire: Pour la hauteur 38 mètres, et pour la distance 400 mètres environ.

N. B. La ligne de **Roumélle** (MER-NOIRE) a été éclairée le 15 Août 1863 N. S. et celle de **Caramanie et Syrie**, le 1^{er} Octobre 1863 N. S.

Constantinople, le 28 Octobre 1865.

OSMANLI ARŞIVI		
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ADMINISTRATION GÉNÉRALE

Des Phares de l'Empire Ottoman.

AVIS AUX NAVIGATEURS.

Les navigateurs sont prévenus que les deux feux ci-après désignés seront allumés aux dates indiquées ci-bas.

Les longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.

Les aires de vent sont rapportées au méridien vrai de chaque lieu.

Golfe de Nicomédie.

(MER DE MARMARA.)

DİL-BOURNOU.

Sur la pointe Dil-Bournou à 250 mètres environ de distance de son extrémité et à droite en entrant dans le golfe de Nicomédie.

Un feu fixe vert

Latitude 40° 43' 10" Nord.

Longitude 29° 32' 15" Est méridien de Greenwich.

Longitude 27° 12' 00" E. méridien de Paris.

Élévation du feu au-dessus du niveau de la mer, 12 mètres.

Portée 5 milles.

Date de l'éclairage 10 décembre 1863 n.s.

ZEİTİN-BOURNOU.

A l'extrémité de la pointe la plus avancée du cap Zeitin-Bourrou et à gauche dans le golfe de Nicomédie.

Un feu fixe rouge.

Latitude 40° 43' 30" Nord.

Longitude 29° 50' 15" Est méridien de Greenwich.

Longitude 27° 30' 00" E. méridien de Paris.

Élévation du feu au-dessus du niveau de la mer 10 mètres.

Portée 6 milles.

Date de l'éclairage 6 décembre 1863 (n.s.)

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ADMINISTRATION GÉNÉRALE DES PHARES DE L'EMPIRE OTTOMAN

AVIS AUX NAVIGATEURS

Les navigateurs sont prévenus que les deux feux ci-après désignés seront allumés le 15 janvier 1864 (N. S.)

Les longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.

Les aires de vent sont rapportées au méridien vrai de chaque lieu.

Ligne de Rhodes.

PORT DE RHODES.

Sur la tour St. Elme.
Un phare feu de 4^e ordre tournant de minute en minute.
Latitude 36° 26' 00" Nord
Longitude 28° 16' 20" E.mérid.de Greenwich
» 25° 56' 05" E.mérid.de Paris.
Élévation du feu au-dessus du niveau de la mer 23 mètres. Portée, 14 milles.

POINTE DITE DES MOULINS, POINTE MOLIVO OU KQUM BOURNOU.

Sur la pointe dite des Moulins et à 120 mètres de distance de son extrémité.
Un feu de port rouge.
Latitude 36° 27' 15" Nord.
Longitude 28° 15' 43" E.mérid. de Greenwich
» 25° 55' 50" E.mérid. de Paris.
Élévation du feu au-dessus du niveau de la mer, 16 mètres. Portée, 4 milles.

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ADMINISTRATION GÉNÉRALE DES PHARES DE L'EMPIRE OTTOMAN

AVIS AUX NAVIGATEURS.

Les navigateurs sont prévenus que les feux ci-après désignés seront allumés le 31 Janvier 1864 (N. S.)

Les longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.

Les aires de vent sont rapportées au méridien vrai de chaque lieu.

Eigne de Samos et Cos.

GOLFE DE VATHI

(Dans le Nord de l'île de Samos).

Sur la pointe E. dite Cotzica à gauche en entrant dans le Golfe de Vathi.

Un feu de port blanc.

Latitude 57° 46' 20" Nord.

Longitude 26° 59' 15" E. mérid. de Greenwich

" 24° 59' 00" E. mérid. de Paris.

Élévation du feu au dessus du niveau de la mer, 40 mètres. Portée, 6 milles.

PORT DE TIGANI

(Dans le Sud de l'île de Samos).

Sur la pointe Fonia ou Possidon, à 40 mètres environ de son extrémité, à droite en entrant dans le Port.

Un feu de port blanc.

Latitude 37° 41' 00" Nord.

Longitude 26° 56' 43" E. mérid. de Greenwich

" 24° 56' 50" E. mérid. de Paris.

Élévation du feu au dessus du niveau de la mer, 22 mètres. Portée, 6 milles.

SCALA NUOVA

Sur la pointe N. O. de l'ilot et contre le mur de la forteresse à droite en allant prendre le mouillage de la rade de Scala Nuova.

Un feu de port blanc.

Latitude 37° 51' 30" Nord.

Longitude 27° 16' 33" E. mérid. de Greenwich

" 24° 56' 20" E. mérid. de Paris.

Élévation du feu au dessus du niveau de la mer, 50 mètres. Portée, 6 milles.

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ADMINISTRATION GÉNÉRALE DES PHARES DE L'EMPIRE OTTOMAN

AVIS AUX NAVIGATEURS.

Les navigateurs sont prévenus que les 5 feux suivants de la ligne de Caramanie et Syrie seront allumés aux époques ci-après désignées.

Les longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.

Les aires de vent sont rapportées au méridien vrai de chaque lieu.

Ligne de Caramanie et Syrie. (suite)

ALEXANDRETTE. (Caramanie)

Sur la pointe Ouest d'Alexandrette, et à 20 mètres de son extrémité.

Deux feux de port blancs installés à l'aplomb l'un de l'autre.

Latitude 56° 55' 50" Nord.

Longitude 56° 10' 20" E. mérid. de Greenwich.

» 55° 50' 05" E. mérid. de Paris.

Élévation du feu supérieur au dessus du niveau de la mer, 15 mètres. Portée, 5 milles.

Date de l'éclairage, 1^{er} Avril 1864. (N. S).

LATAKIÉ. (Syrie)

Sur la partie Nord de l'ancien château, à gauche en entrant dans le port, et à la place de l'ancien fanal.

Un feu de port rouge.

Latitude 35° 50' 50" Nord.

Longitude 35° 46' 50" E. mérid. de Greenwich.

» 35° 26' 15" E. mérid. de Paris.

Élévation du feu au dessus du niveau de la mer, 15 mètres. Portée, 4 milles.

Date de l'éclairage, 15 Avril 1864. (N. S).

CAIFFA. (Syrie)

Sur le château de la ville et à droite de l'office Sanitaire,

Deux feux de port blancs installés à l'aplomb l'un de l'autre.

Latitude 32° 47' 40" Nord.

Longitude 33° 05' 00" E. mérid. de Greenwich.

» 32° 44' 45" E. mérid. de Paris.

Élévation du feu supérieur au dessus du niveau de la mer, 20 mètres. Portée, 5 milles.

Date de l'éclairage, 25 Avril 1864. (N. S).

N. B. — Des avis ultérieurs feront connaître prochainement l'éclairage des autres feux de cette ligne, au fur et à mesure de leur achèvement.

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ADMINISTRATION GÉNÉRALE DES PHARES DE L'EMPIRE OTTOMAN.

AVIS AUX NAVIGATEURS.

Les navigateurs sont prévenus que les feux ci-après désignés seront allumés le 15 Juillet 1866 (N.S.)
Les longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.
Les aires de vent sont rapportées au méridien vrai de chaque lieu.

Ligne de Caramanie et Syrie.

PORT de SOUR (Ancienne Tyr)

Sur la pointe ouest de la ville de Sour sur une ancienne batterie au bord de la mer.

Deux feux de port blancs installés à l'aplomb l'un de l'autre.

Latitude 35° 17' 00" Nord.

Longitude 35° 14' 50" E. Méridien de Greenwich.

" 32° 54' 35" E. Méridien de Paris.

Elévation du feu supérieur au dessus du niveau de la mer, 17 mètres. Portée 5 milles.

PORT de SAÏDA (Ancienne Sidon)

Au sud de l'île de Saïda et devant l'entrée de l'ancien port de la ville de Saïda et à 200 mètres environ de l'extrémité.

Deux feux de port rouges installés à l'aplomb l'un de l'autre.

Latitude 33° 34' 15" Nord.

Longitude 35° 24' 40" E. Méridien de Greenwich.

" 35° 4' 25" E. Méridien de Paris.

Elévation du feu supérieur au dessus du niveau de la mer 19 mètres.

Portée 5 milles.

Ligne de Roumèlle (Mer noire)

CAP KOURI.

Sur le cap Kouri à 40 mètres environ de son extrémité

Un phare feu fixe varié par des éclats de 2 minutes en 2 minutes.

Latitude 41° 52' 30" Nord.

Longitude 28° 04' 15" E. Méridien de Greenwich

" 25° 44' 00" E. Méridien de Paris.

Elévation du feu au dessus du niveau de la mer 55 mètres. Portée 15 milles.

CAP KALACRIA.

Sur le cap Kalacria à 18 mètres environ de son extrémité.

Un phare tournant de 1 minute en 1 minute.

Latitude 45° 21' 50" Nord.

Longitude 28° 50' 15" E. Méridien de Greenwich

" 26° 40' 00" E. Méridien de Paris.

Elévation du feu au-dessus du niveau de la mer, 50 mètres.

Portée 16 milles.

Constantinople le 27 Juin 1866.

OSMANLI ARSIVI		
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ADMINISTRATION GÉNÉRALE

DES

PHARES DE L'EMPIRE OTTOMAN

AVIS AUX NAVIGATEURS

Les navigateurs sont prévenus que parmi les feux ci-après désignés qui sont en construction les suivants seront allumés aux dates indiquées ci-bas.

Les longitudes qui déterminent les positions sont comptées d'après les méridiens des observatoires de Greenwich et de Paris.

Les aires de vent sont rapportées au méridien vrai de chaque lieu.

MER NOIRE.

KEFKEN-BOURNOU (Côte d'Anatolie).

A 60 mètres de l'extrémité Ouest de l'îlot du Cap Kefken et à 250 mètres des dangers qui se trouvent dans cette direction.

2 feux blancs superposés.

Latitude 41° 13' 56" Nord.

Longitude 30° 17' 45" E. mérid. de Greenwich

" 27° 57' 30" E. méridien de Paris.

Élévation du feu supérieur au-dessus de la mer, 30 mètres.

Portée 10 milles.

Date de l'éclairage, 30 novembre 1879, (n. s.)

ANASTRA (Côte d'Anatolie) (Modification).

A partir du 30 novembre 1879, (n. s.) le Phare à feu fixe rouge placé sur le sommet du Cap formant l'extrémité de la presqu'île.

Latitude 41° 45' 20" Nord.

Longitude 32° 24' 43" E. mérid. de Greenwich

" 30° 04' 30" E. méridien de Paris.

Élévation au-dessus du niveau de la mer, 95 mètres.

Sera remplacé par un Phare scintillant à éclats de 10 secondes en 10 secondes d'une portée de 16 milles.

TRÉBIZONDE (Côte d'Anatolie) (Modification).

A partir du 30 novembre 1879, (n. s.) le Phare à feu fixe blanc placé sur la pointe Kalmet entre deux embrasures de la batterie élevée sur le sommet de ce Cap.

Latitude 41° 01' 00" Nord.

Longitude 39° 46' 25" E. mérid. de Greenwich

" 37° 26' 10" E. méridien de Paris.

Élévation du feu au-dessus du niveau de la mer, 32 mètres.

Sera remplacé par un Phare tournant à éclats de 1 minute en 1 minute d'une portée de 16 milles.

CANAL DE MÉTELIN.

MACARONIA (Côte d'Anatolie).

A 50 mètres environ de l'extrémité de la pointe et au milieu de la ferme de ce nom; cette pointe est presque Est et Ouest du port de Mételin.

Deux feux blancs superposés.

Latitude 39° 08' 00" Nord.

Longitude 29° 50' 55" E. mérid. de Greenwich

" 24° 30' 40" E. méridien de Paris.

Élévation du feu supérieur au-dessus du niveau de la mer, 16 mètres.

Portée 10 milles.

Date de l'éclairage, 30 novembre 1879, (n. s.)

CANAL DE SCIO OU CHIO.

TCHESMÉ (Côte d'Anatolie).

A l'extrémité du Cap Kézil ou Ayasmatha à droite en entrant dans le port de Tchesmé.

1 feu fixe blanc.

Latitude 38° 19' 55" Nord.

Longitude 26° 17' 45" E. mérid. de Greenwich

" 23° 57' 30" E. méridien de Paris.

Le bout de rochers se trouve dans l'O.N.O. 1/2 O. du compas du feu et environ à un mille de distance.

Élévation du feu au-dessus du niveau de la mer, 20 mètres.

Portée 10 milles.

Date de l'éclairage, 30 novembre 1879 (n. s.)

FEUX

qui seront prochainement éclairés :

MER NOIRE.

BAFFRA BOURNOU 2 feux blancs superposés. Portée 10 milles.

TOHIVA BOURNOU 2 feux rouges superposés. Portée 10 milles.

VONA BOURNOU 2 feux blancs superposés. Portée 10 milles.

MER MÉDITERRANÉE (Archipel).

GOLFE DE SALONIQUE.

Sur un navire qui sera mouillé à l'extrémité du banc de Varda (le navire sera point en rouge).

2 feux rouges superposés, portée 8 milles.

BOUDROUM (Canal de Cos).

2 feux blancs superposés. Portée 10 milles.

CASTELLORIZO (Côte de Caramanie).

2 feux blancs superposés. Portée 10 milles.

DÉDÉAGATCH (Côte de Macédoine).

1 Phare tournant de 30" en 30". Portée 18 milles.

EN CONSTRUCTION:

MER NOIRE (Côte de Roumélie).

EMONEN-BOURNOU.

1 Phare scintillant à éclats de 10 en 10 secondes. Portée 20 milles.

MER MÉDITERRANÉE.

ALAYA (Côte de Caramanie).

1 Phare feu fixe varié par des éclats de 1 minute en 1 minute. Portée 15 milles.

CAP AGHIOS IOANNIS (Ile de Crète).

2 feux blancs superposés. Portée 10 milles

CAP SIDERO (Ile de Crète).

1 Phare tournant. Portée 16 milles.

ILE DE GAYDO (Ile de Crète).

Sur l'île de ce nom situé à 23 milles dans le Sud de la partie occidentale de l'île de Crète.

1 Phare tournant sur le sommet de l'îlot.

Portée 25 milles.

TRIPOLI (Côte de Barbarie).

1 Phare tournant. Portée 15 milles.

BENGHAZI (Côte de Barbarie).

1 Phare tournant. Portée 15 milles.

DERNA (Côte de Barbarie).

1 Phare fixe. Portée 14 milles.

MER ADRIATIQUE.

POINTE SAMANA (Côte d'Albanie).

2 feux blancs superposés. Portée 10 milles.

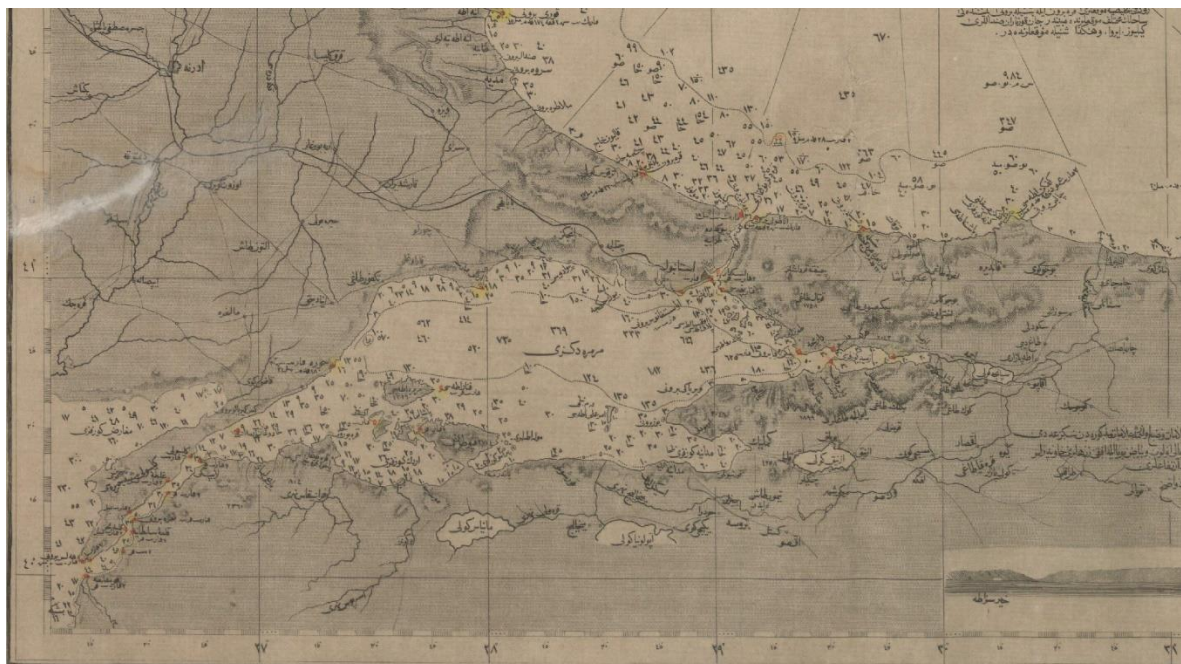
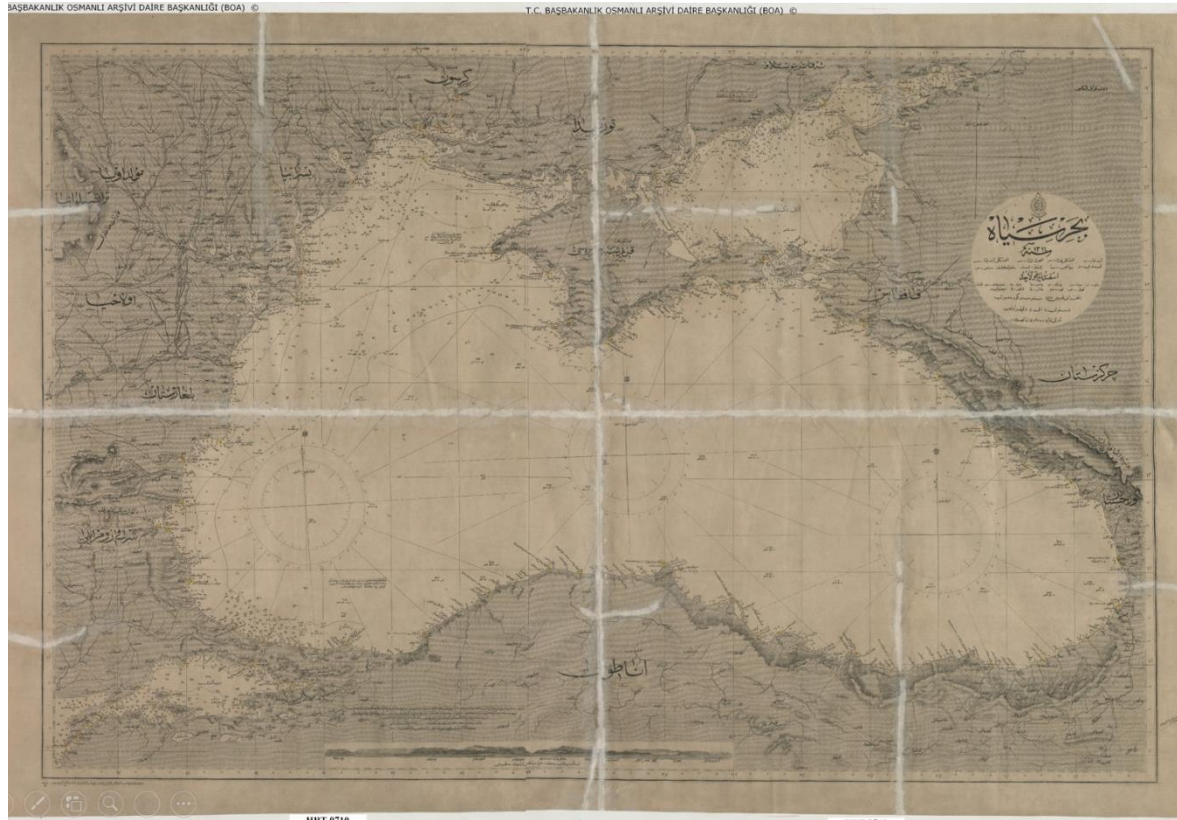
Imp. A. ZELICH & FILS, Toké de Péra.

OSMANLI ARŞIVI		
HR.TO		
522	41	2

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APPENDIX E

MAP OF LIGHTHOUSES AT BLACK SEA SHORES IN 1899



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